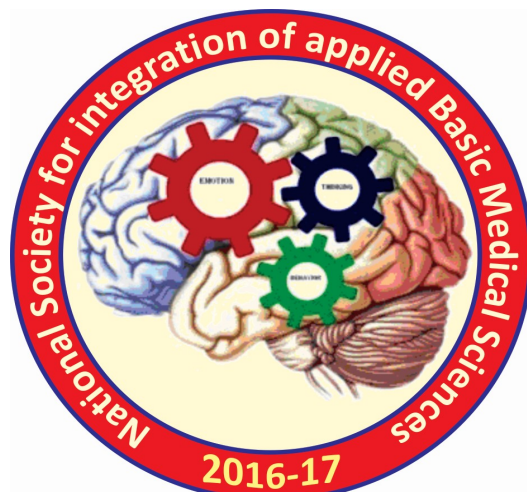


# INDIAN JOURNAL OF APPLIED BASIC MEDICAL SCIENCES



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## 1

## EDITORIALS

## AETCOM: A NEW HORIZON

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AETCOM: Attitude, ethics and communication... These are pillars of successful doctors. By successful doctors, we mean, doctors having all attributes of Indian Medical Graduate. The overall goal of undergraduate medical education programme as described in the revised Regulations on Graduate Medical Education - 2012 (GMR 2012)<sup>1</sup> is to create an "Indian Medical Graduate"(IMG) possessing requisite knowledge, skills, attitudes, values and responsiveness, so that he or she may function appropriately and effectively as a physician of first contact of the community while being globally relevant. Accordingly, IMG should be able to function in the following ROLES appropriately and effectively:

\* *Clinician*: who understands and provides preventive, promotive, curative, palliative and holistic care with compassion.

\* *Leader* and member of the health care team and system with capabilities to collect analyze, synthesize and communicate health data appropriately.

\* *Communicator* with patients, families, colleagues and community.

\* *Lifelong learner* committed to continuous improvement of skills and knowledge.

\* *Professional*: who is committed to excellence, is ethical, responsive and accountable to patients, community and profession.

Currently, our IMG's function effectively as predominantly clinicians. For a competent IMG, they should possess all 5 roles in equal proportion ie. All IMG's should be effective clinicians, leaders, communicators, life long learners and professionals.

Most of the IMG's are at present competent in cognitive (knowledge) domain and to some extent in psychomotor (skills) domain. However, they lack affective (attitudinal and communication domain). As a result of this, a lot of mistrust has developed between doctors and patients jeopardizing doctor-patient relationship. This has resulted in lot of litigations against doctors. Most vital areas of patient management such as empathy, professionalism, and ethics are lacking in fresh undergraduates<sup>2,3</sup>. There could be many reasons for lack of attitudinal domain among IMG's, most prominent among them is, this domain is sort of 'hidden curriculum'. Students are supposed to learn this vital domain by themselves as there is no formal training on this aspect. Hence, students try to 'catch' it via role models or by trial and error. Since ethics, communication, professionalism, humanities etc is not in formal curriculum, it is not assessed or taught. We know that assessment drives learning... since there is no assessment, the students do not formally learn it. Also, our traditional curriculum is segmented with water tight disciplines. All these limitations of traditional curriculum has resulted in IMG's who are not competent.

Miller's pyramid of clinical competence has 4 levels: knows, knows how, shows how and does. For a competent IMG, we need our students to go to higher levels of Miller's pyramid as they progress in their undergraduate medical studies. At present, since most of traditional curriculum is cognitive based and non-interactive, students are able to go upto knows how level only. If the students are formally trained and assessed in all three domains, they can go upto 'shows how' level at end of their internship. Main aim of facilitators should be to incorporate effective interactive teaching learning methods including self directed learning, to guide students towards higher levels of Miller's pyramid. Assessment forms core of CBME. Effective assessment methods, specially formative assessment with regular feedback is hallmark of CBME, which help students attain higher levels of Miller's pyramid.

Medical Council of India is working towards bringing in competency based medical curriculum (CBME), aimed at integration of interactive class room learning, community learning and early clinical exposure via AETCOM module.

To overcome limitations of traditional medical curriculum, MCI has rolled out AETCOM (Attitude and communication module)<sup>4</sup>.

AETCOM education tries to bridge the gap between doctors and patients. It is longitudinal modular program, spanning across whole of undergraduate medical studies. AETCOM focuses mainly on ethics, communication and attitudinal domain, in addition to cognitive and psychomotor domain. It also includes another grey area, medicolegal aspect in medicine. Main aim of AETCOM module is to guide undergraduate medical students towards unconscious competency.

Though the idea of implementation of AETCOM module is too lucrative, there may be challenges during its implementation. Challenges may be in terms of newer teaching learning methods, assessment, infrastructure etc. However, careful and phasic implementation promises a new horizon.

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## 2

### ORIGINAL RESEARCH ARTICLE

#### PERCEPTION OF MEDICAL TEACHERS ABOUT INTEGRATED TEACHING IN MEDICAL CURRICULUM

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#### **ABSTRACT**

**Background:** Integrated teaching has been incorporated into syllabus but the willingness of teachers to implement this need to measure. Perception of teachers for its advantages, disadvantages, hurdles while implementing it requires assessing. **Aims and Objectives:** To analyze the perception of medical teachers about integrated teaching. **Material and Methods:** The study tool was a demographic profile and a predesigned, prevalidated questionnaire. **Results:** Present study shows that medical teachers have accepted integrated medical curriculum as they perceived it as wholesome approach, improves teacher- student, teacher-teacher and interdepartmental relations.

**Conclusion:** In present study has proven that integrated medical curriculum is the need of time and well accepted by medical teachers.

**Key words:** Integrated teaching, Perception of medical teachers

## **INTRODUCTION**

Although medical education is improving day by day there are still some lacunae which need to be address. <sup>1</sup> The aim of medical education is quality assurance with health care system. To achieve this aim progress in medical education is must. This is a dynamic process involving continuous change by reviewing and reforming the curriculum. Hindrances at any stage of this process will block the progress in the field of medical education. <sup>2</sup> Some medical educators are of the opinion that traditional teaching in medical curriculum is not able to fulfill the objectives. Traditional teaching is done with didactic lecture since many years. There are certain lacunae, drawbacks present in current curriculum like redundancy, repetition, overlapping, time consuming etc. A delivery of tremendous expanded knowledge in medical education in short duration of course is now a big challenge to medical teachers. This has forced medical teachers to innovate teaching learning methods to make then short and interesting with emphasis on student engagement. <sup>3</sup> Strong base & clear concepts of students will make them efficient to tackle with the exponential knowledge of medical education. To improve the undergraduate medical curriculum some modifications are expected in teaching methods for betterment of students. <sup>4</sup> By mean of integrated teaching we can able to overcome these drawbacks. <sup>5</sup> Shoemaker defines an integrated curriculum as “education that is organized in such a way that it cuts across subject matter lines, bringing together various aspects of the curriculum into meaningful association to focus upon broad areas of study.” <sup>6</sup> There is a need of horizontal as well as vertical integration of all possible topics in medical education. This wholesome approach will improve the delivery of medical education to medical students to cater better quality of health care services to community. <sup>7</sup> There are controversies among medical teachers whether to continue traditional teaching methods or to adopt integrated teaching methods in medical curriculum but we must try newer techniques to prove their efficacy and amalgamate various methods. <sup>8</sup>

For proper implementation of integrated teaching many factors should be taken into consideration to make it more effective. <sup>9</sup> One of the major factors is interdepartmental cooperation and coordination without which integrated teaching is impossible. Other factors include time management, boredom of sessions, novel knowledge delivery system, and burden on the students' etc. <sup>10</sup> Though Medical Council of India, regulations on Graduate Medical education, 1997 amended up to July 2017 and syllabus of Maharashtra University of Health Sciences, Nashik has incorporated integrated teaching but implementation of it in every medical college is still questionable. <sup>11</sup> Before implementation of any method, the acceptance and preparedness of medical teachers is required. Their attitude towards implementation is the key for success. Hence it is important to evaluate perception of teachers for implementation of integrated teaching. In present study we have tried to evaluate medical teacher's opinions about integrated teaching to evaluate the perception and acceptance of teachers towards exposure to integrated teaching method.

## **Aims and Objectives**

- 1) To evaluate teachers view on integrated teaching method.
- 2) To analyze factors considered by teachers during planning of integrated sessions.
- 3) To analyze hurdles during planning of integrated sessions.

## **Methodology**

A questionnaire based study was designed involving medical teachers. The objectives of the study were explained to the participants. Demographic information was collected. Predesigned and Prevalidated questionnaire was administered and collected after 20 minutes. A written informed consent was obtained from each participant before commencing the study and confidentiality of participants was maintained throughout the study. Those who were not willing to participate or did not return the questionnaire within the stipulated time were excluded.

## **Results and Analysis**

Out of 100 participants, average age for male was 45 yrs with 95 % confidence interval of 27 yrs to 62 yrs while female average age was 44 yrs ranging in 95 % confidence interval of 27 yrs to 61 yrs.

Under this study, all participants have attempted 99% questions from the desired questionnaire.

In this descriptive study, count response is more than the number of participants as more than one opinion is received by each participant.

Figure 1

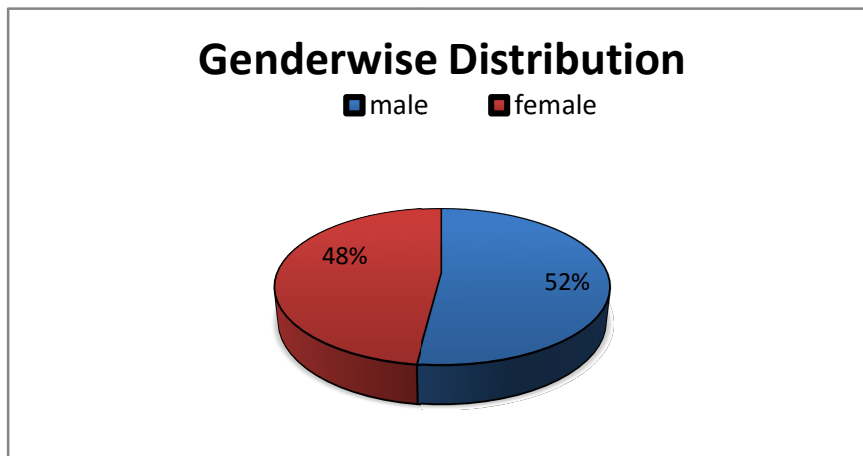


Figure 1 shows that 52 % males participated in the study and replied for the designed questionnaire.

Figure 2

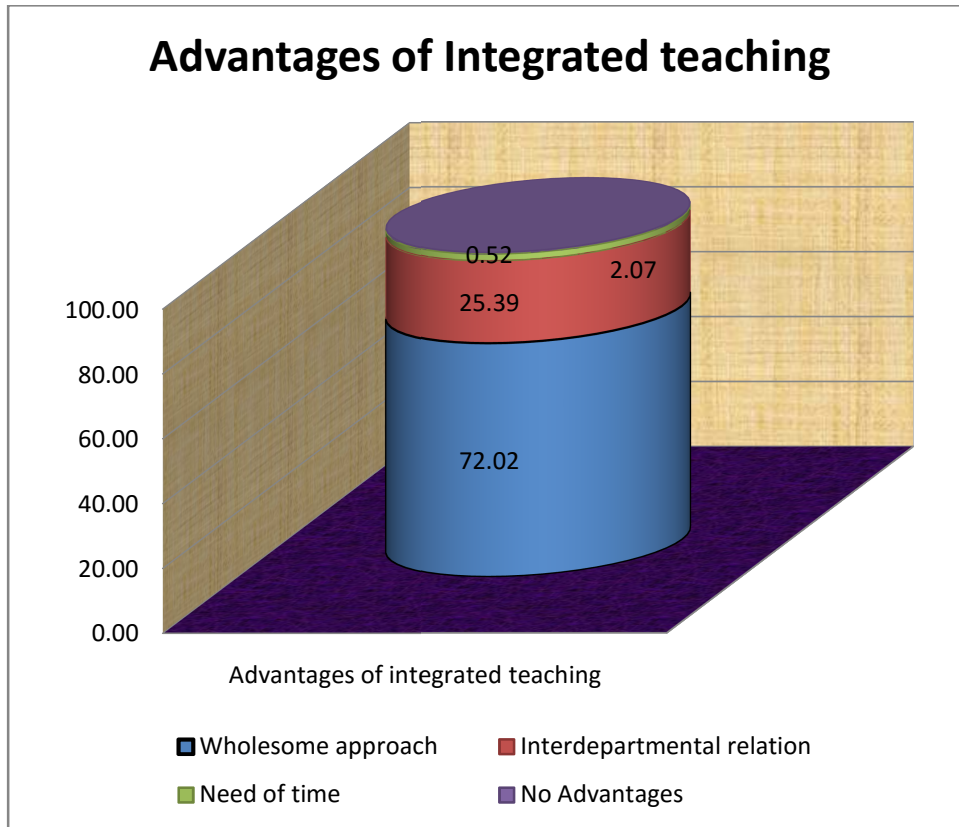


Figure 2 shows the advantages of integrated teaching.

Out of 100 participant medical teachers 99 have attempted the question. 1 participant has not attempted the question. It may be due to lack of awareness about integrated teaching so that participant is not able to give feedback related to that.

About 72.02% participants thought that it will work as wholesome approach. About 25.39% participant thought that it will help to improve interdepartmental relation.

About 2.07% participant thought that it is need of time. Remaining 0.52% participant thought that there are no advantages of integrated teaching

Figure 3

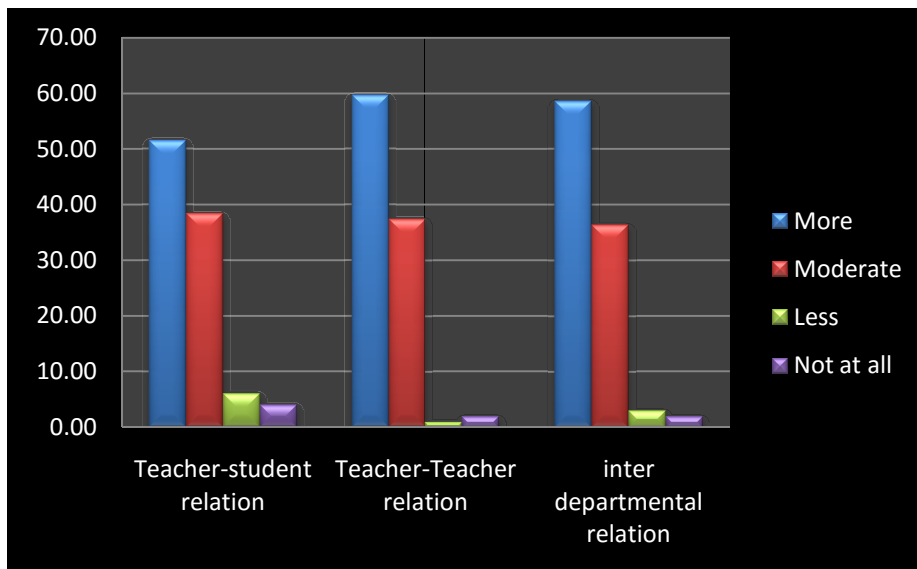


Figure 3 shows the comparative effect of integrated teaching among teacher-student relation, teacher-teacher relation and interdepartmental relation respectively.

Out of 100 participant medical teachers 99 have attempted the question. 1 participant has not attempted the question. As per our study due to integrated teaching relation between teacher-student, teacher-teacher and interdepartmental will be more effective.

Figure 4

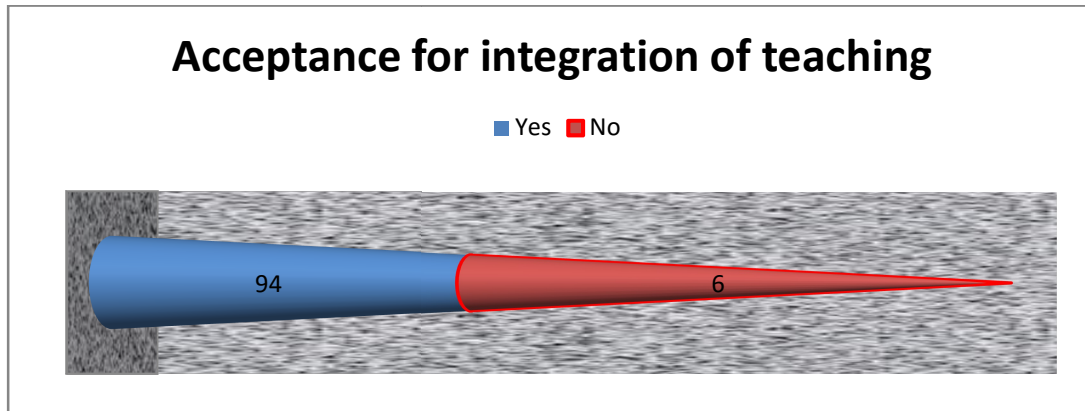


Figure 4 shows that approximately 94% participants have accepted integrated teaching concept. All the 100 participant medical teachers have attempted the question.

### **Discussion**

In present descriptive study, 97 participating medical teachers have opined about integrated teaching. Since more than one opinion is received by each participant, count response is more than the number of participants. Out of 97, 113 opinions stating that integrated teaching is a good concept as it give novel knowledge delivery system, wholesome approach. Kayani Z A et al has talked about it as promotion of relevance and cross connections across various disciplines and also about reduced excessive information and repetition of content.<sup>1</sup> In our study, medical teachers have also mentioned about increase effectiveness by avoiding repetitions, easy understanding and interest due to clarity of concept in subject by the students. Jessica Muller et al in their study have recognized similar type of benefits along with enhanced, meaningful and relevant learning.<sup>12</sup> It will save time of delivery of topic though requires good collaboration among intra and inter departmental teachers.

Sarmishtha et al in her study has also stated about similar perceptions by faculty.<sup>13</sup> In present study 3 faculties feel it is not feasible and subject should be taught separately and one faculty stated that there is no advantage of integrated teaching. As Kayani Z A et al has pointed out that few departments try to control over information, probably this may be the reason for non integration and separate teaching by departments.<sup>1</sup> This indicates though most of faculties are open towards newer concept of integrated teaching which has been incorporated at syllabus of university but a small number is still doubtful about its application in curriculum. We agree with Sarmishtha et al for non application of assessment method for integrated teaching as assessment is still done according to traditional teaching<sup>13</sup>. Assessment method is key of learning by students. Hence, it is important to modify assessment methods at university level as per newer education processes.



According to them this collaboration between departments can improve teacher-teacher, teacher-student as well as interdepartmental relationship. 99 Participating medical teachers commented on relationship and they believe teacher- teacher relationship will improve the most i.e. 60% with close proximity of interdepartmental relationship of 59% and only 51.52% of teacher students relationship. It is obvious that to prepare integrated teaching teachers need to spend more time and brainstorm with each other compare to delivery of didactic lecture. One teacher who has not commented on it may be due to lack of awareness about it. But 99% of teachers are aware about its effects.

141 opinions for the major disadvantage was interdepartmental cooperation. 95 opinions for other factors like time and faculty management. 20 opinions still favor integrated teaching with no disadvantages. Nothing comes without hurdles. Faculties felt that time consumption, consideration of interdepartmental co-ordination, syllabus, feedback and interest of students are the various factors which need to be considered while planning the session. Out of the entire most significant factor i.e. 174 opinions was interdepartmental coordination. Jessica Muller et al in their study found almost similar feedback about course planning and implementation, co-ordination and joint planning between teachers from different departments.<sup>12</sup>

Though there are hurdles still 94 medical teachers are willing to have integrated teaching. They feel that there are more advantages of integrated teaching than disadvantages. We can overcome most of the hurdles by proper planning, considering certain factors and interdepartmental co-operation and co-ordination while planning the sessions. When asked about suggestions regarding integrated teaching, their opinions were proper interdepartmental co-ordination and more awareness among medical teachers to conduct such sessions, vertical and horizontal integration, standard integrated teaching modules, and feedback from the students and with intent are necessary. They also indicated that regular, skill developing; more interesting sessions and facilitating knowledge for self study to students are required. Most of teachers feel that it is need of time & necessary. In this study we have taken the feedbacks of the teachers of only single government medical college. Involving other medical college teachers including private medical colleges may give diverge information about hurdles face at different levels. Presence of Integrated teaching in medical curriculum is inevitable. Proper implementation at all medical colleges is today's need. This is possible by training medical professionals to overcome hurdles and motivating them for incorporation of it in their daily routine of teaching.

### **Conclusion**

In the present study, we can conclude that medical teachers are well aware of integrated teaching and ready to implement in their present curriculum. Looking at the advantages of it, medical teachers are willing to take extra steps to ensure its inclusion in day to day teaching activities.

### **Acknowledgement**

We are thankful to Dr. Kamkhedkar, HOD, Anatomy and all the participants of the study.

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**Original article****A STUDY TO ASSESS RELATION BETWEEN INTRA-OCULAR PRESSURE AND MYOPIA IN DIFFERENT AGE GROUPS****Nayan Mali\*, Neeta Mehta\*\*, Chirag Banker\*\*\***

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**Abstracts:**

**Back ground and Objective** Myopia is one of the commonest ocular disorders. Some studies reported that the mean IOP value of myopes was significantly higher than that of emmetropes. So in this study we aimed to evaluate the relationship between intraocular pressure and myopia in different age groups.

**Material and Method:**An observational study carried out at department of Physiology and M & J Institute of Ophthalmology, B J Medical College, Ahmedabad during July 2017 to August 2017.100 subjects with myopia were included in this study. The investigator visited the out-patient department (OPD) of ophthalmology and newly diagnosed patients of myopia were enrolled for the study. After general examination power of eye (D) and intra-ocular pressure by Perkin's applanation tonometer were noted. Correlation between power of eye and IOP was established in different age groups . IOP was also correlated to different grades of myopia.

**Results:** In our study intraocular pressure remained normal in all the three grades of myopia in both the eyes. Intra ocular pressure remain within normal limits (14 to 20 mm of Hg) in the myopes of all the ages although it tends to be higher in the younger age group ie Group A (11 – 30 years).**Conclusion:**This IOP elevation in younger myopes could be attributed to myopia progression.

**Key Words:** Intraocular pressure, myopia

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**Introduction:**

Myopia is one of the commonest type of refractive error with worldwide prevalence about 30% and up to 80% in certain Asian population. Many studies reported that the mean IOP value of myopes was significantly higher than that of emmetropes. Although there are some clinical studies which disapprove this correlation. Some studies state that raised IOP could result in myopic axial elongation and promote myopia development.

Until now,

the exact influence of IOP on axial length and human refractive error development remains poorly understood. There are many studies which correlate age and IOP but very few correlate myopia & IOP in different age groups. So in this study we aimed to assess the relation between IOP & myopia in different age groups.

**Material and Methods:**

This is an observational study and carried out at department of Physiology and M & J Institute of Ophthalmology, B J Medical College, Ahmedabad during July 2017 to August 2017.

Patients were enrolled in the study after obtaining verbal consent. 100 subjects with myopia were included in this study. The investigator visited the out-patient department (OPD) of ophthalmology and newly diagnosed patients of myopia were enrolled for the study. After general examination power of eye (D) and intra-ocular pressure by Perkin's applanation tonometer were noted. Subjects were divided into three age groups Group I—Subjects with age 11 to 30 years (45 subjects), Group II— Subjects with 31 to 50 years (30 subjects) & Group III— Subjects with age 51 to 70 years (25 subjects). Correlation between power of eye and IOP was established in different age groups. IOP was also correlated to different grades of myopia. (Low myopia: -0.75 to -3.00 D, Moderate Myopia: -3.00 to -5.00 D, High Myopia: >-5.00 D)

**Result:** Total 100 patients were enrolled with mean age  $\pm$  SD of the patient was  $39.81 \pm 1.8$ . Total number of male was 60 and female was 40 with ratio M:F=1.5:1.

There was no significant difference in gender distribution among three diagnostic groups in our study.

In our study, total 100 patients had myopia in both eyes, So total 100 right eyes and 100 left eyes were included in our study.

Patients included in our study were divided in 3 groups as mentioned in following table 1

**Table: 1 Distribution of age in patients**

Age distribution in years	Total eye of patients	
	Right eye(100)	Left eye(100)
Group A: 11-30	45	45

<b>Group B: 31-50</b>	<b>30</b>	<b>30</b>
<b>Group C: 51-70</b>	<b>25</b>	<b>25</b>

Our study included 45,30& 25 subjects in Groups A,B&C respectively.

**Table:2: Comparison between power of eye and intra-ocular pressure in different grades of myopia.( Left Eye )**

	<b>Power of eye</b>	<b>Intra-ocular pressure( mm Hg)</b>	<b>P value</b>
<b>Group A: Low Myopia</b>	<b>1.98±0.1</b>	<b>14.43±0.4</b>	<b>&lt;0.0001</b>
<b>Group B: Moderate Myopia</b>	<b>4.16±0.07</b>	<b>15.89±0.49</b>	<b>&lt;0.0001</b>
<b>Group C: High Myopia</b>	<b>5.66±0.12</b>	<b>16.55±0.76</b>	<b>&lt;0.0001</b>

**Table:3: Comparison between power of eye and intra-ocular pressure in different grades of myopia.( Right Eye )**

	<b>Power of eye</b>	<b>Intra-ocular pressure( mm Hg)</b>	<b>P value</b>
<b>Group A: Low Myopia</b>	<b>2.09±0.09</b>	<b>16.5±0.53</b>	<b>&lt;0.0001</b>
<b>Group B: Moderate Myopia</b>	<b>4.08±0.08</b>	<b>14.37±0.78</b>	<b>&lt;0.0001</b>
<b>Group C: High Myopia</b>	<b>5.98±0.12</b>	<b>17±0.83</b>	<b>&lt;0.0001</b>

As evident From **Table 2 & Table 3** in our study intraocular pressure remained normal in all the three grades of myopia in both the eyes.

	<b>Power of eye(diopters) (Myopia)</b>	<b>Intra-ocular pressure (mm Hg)</b>
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	Right eye	Left eye	Right eye	Left eye
<b>Group A: 11-30</b>	<b>5.66±0.1 2</b>	<b>6.01±0.2</b>	<b>16.43±0.4</b>	<b>17.43±0. 7</b>
<b>Group B: 31-50</b>	<b>4.16±0.0 7</b>	<b>5.17±0.1</b>	<b>15.89±0.4 9</b>	<b>15.41±0. 4</b>
<b>Group C: 51-70</b>	<b>1.98±0.1</b>	<b>4.69±0.5</b>	<b>14.55±0.7 6</b>	<b>14.79±0. 2</b>

**Table:4 Comparison between power of eye and intra-ocular pressure in different age group of patients.**

Table 4 show that in our study intra ocular pressure remain within

normal limits (14 to 20 mm of Hg) in the myopes of all the ages. Although it tends to be higher in the younger age group ie Group A (11 – 30 years).

**Discussion:** In our study we did not find any significant correlation between IOP and different grades of myopia. Only in the younger age groups (11-30 yrs) there was some correlation (again statistically insignificant) between myopia and IOP( IOP of these subjects were in the upper limits of normal range).

In our study intraocular pressure remained normal in all the three grades of myopia in both the eyes. In the study performed by Dini Sunny Joseph et al there is statistically significant correlation between IOP and myopia, in moderate and high myopia groups<sup>1</sup>. The exact relationship between IOP and myopia had been investigated by a number of studies, but the results seemed to be contradictory<sup>2,3-4</sup>. Some researchers<sup>2,3</sup> reported a significant association between IOP and myopia progression, whereas others<sup>4,5</sup> found no certain relationship between them. However, unlike the uncertainty of the relationship between static IOP values and myopia progression, IOP variations had been demonstrated to cause refraction and AL changes in many studies. However we cannot comment upon the relationship between myopia and raised IOP because of the lack of association.

In our study there is no increase in IOP with increasing age. In similar studies, increasing age was associated with increasing IOP values<sup>7,8</sup> and in some of them this relation was not significant<sup>8</sup>. Raised IOP leads to axial elongation of eyeball by inducing scleral stress (creep). Previous studies in this area have given inconsistent results with only some finding a significant association between myopia and raised IOP.

Since it is a cross-sectional study cause-effect relationship between myopia and IOP cannot be ascertained. Inconsistent associations between myopia and IOP across different studies could be due to different characteristics of subject groups. It is also observed that incidence of glaucoma is high among high myopics. In this respect, our study serves to reassert the inconsistency probably because of wide age group. Additionally we found the IOP of younger subjects to be in the higher normal range probably because of the progressive myopes have IOP in the higher range.

**Conclusion:**

In our study intraocular pressure remained normal in all the three grades of myopia in both the eyes. In our study intra ocular pressure remain within normal limits (14 to 20 mm of Hg) in the

myopes of all the ages. Although it tends to be higher in the younger age group ie Group A (11 – 30 years). This IOP elevation in younger myopes could be attributed to myopia progression.

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Original Article

**INTRAVENOUS LIGNOCAINE AND INTRAVENOUS LIGNOCAINE PLUS NITROGLYCERINE LINGUAL SPRAY IN ATTENUATION OF HEMODYNAMIC RESPONSES TO TRACHEAL INTUBATION IN CONTROLLED HYPERTENSIVE PATIENTS: A PROSPECTIVE RANDOMIZED CONTROLLED TRIAL**

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**Key words : LIGNOCAINE , NITROGLYCERINE LINGUAL SPRAY, HEMODYNAMIC RESPONSES . TRACHEAL INTUBATION ,HYPERTENSIVE PATIENTS**

### **Abstract**

**Aims and objectives:** To evaluate the efficacy of nitroglycerine (NTG) lingual spray in attenuation of hemodynamic responses following laryngoscopy and intubation in controlled hypertensive patients.**Materials and method:** 60 patients scheduled for elective surgeries, requiring endotracheal intubation were randomized in two groups (30 patients in each group). Group C the control group received lignocaine 1.5 mg/kg intravenously and Group S the study group received lignocaine 1.5 mg/kg intravenous plus one metered spray (400µg) of nitroglycerine (NTG) lingually after induction.**Results:** The changes in heart rate were comparable in both groups. Systolic blood pressure (SBP), diastolic blood pressure (DBP) and mean arterial pressure (MAP) significantly increased in group C when compared to group S from baseline values ( $P < 0.05$ ,  $P < 0.05$  and  $P < 0.01$  respectively). Mean rate pressure product (RPP) rose significantly from baseline following laryngoscopy and tracheal intubation in both groups. Maximum rise in RPP was 44.18% in group C at 1min as compared to 26.3% in group S at 2min. However, this difference was statistically not significant. **Conclusion:** The present study failed to demonstrate any significant reduction in the pressor response to laryngoscopy and



intubation as measured by RPP in controlled hypertensive patient by addition of NTG spray to lignocaine when compared to lignocaine alone. However, the addition of one puff of (400 µg) NTG spray to lignocaine may offer some benefit in patients at an increased risk of advanced cardiovascular events due to transient decrease in MAP.

**Key words:** Nitroglycerine, Laryngoscopy, Intubation, Hypertensive patients, Pressor response.

## **Introduction**

The sympathetic response to laryngoscopy and Endotracheal intubation is a well-known problem that has been challenging anaesthesiologists for several decades.<sup>1</sup> The resultant tachycardia and hypertension from this response pose an enhanced risk to patients with systemic hypertension and may result in left ventricular failure, arrhythmias and myocardial infarction.<sup>2</sup>

A number of agents have been evaluated for obtundation of the response, with varying degree of success.<sup>3</sup>

Nitroglycerine (NTG) causes dilatation of the arterioles and post capillary vessels. This causes reduction in systolic, diastolic and mean arterial pressure and is therefore useful for attenuating the pressor response to intubation. NTG lingual spray is a metered dose spray which delivers 400 µg puffs in form of droplets on or under the tongue. It has successfully been used to blunt the pressor response in normotensive patients,<sup>4</sup> however there is not much literature on its use in hypertensive patients.

The present study was planned to evaluate the effect of NTG spray in attenuating the pressor response in controlled hypertensive patients.

## **Materials And Methods**

The study was carried out in a thousand beded tertiary care teaching hospital. The institutional ethical committee clearance was obtained prior to commencement of the study. An informed, written consent was taken from each participant prior to enrolling them in study.

This study was designed as a prospective, double blinded, Randomised control trial. Sixty patients of either sex, aged 40-60 yrs, belonging to ASA (American Society of Anaesthesiology) physical status II with hypertension, controlled on medication (BP < 140/90 mmHg) and posted for elective surgery under general anaesthesia requiring endotracheal intubation were included and those with anticipated difficult airway, morbid obesity, ASA physical grade III or higher, history of coronary artery diseases (CAD), cardiac arrhythmia, neuromuscular disease, known allergy to anaesthetic or any other drug and those taking phosphodiesterase inhibitors were excluded from the study.

The calculated sample size was based on a pilot study, in which we found that the mean BP immediately after intubation rose by 24 mmHg in the lignocaine 1.5 mg/kg intravenously over a period of 5-10 seconds as compared to 8 mmHg in lignocaine plus NTG (400 µg per spray), difference of 16 mmHg seen. The standardized difference for the two groups was 0.88. For the study to have a power 90% with a type 1 error of < 0.05%, we needed 55 patients in two groups. Therefore we decided to include 30 patients in each group to compensate for dropouts.

Sixty patients were allocated randomly in 2 groups (30 patients in each group) using an opaque sealed envelope technique and a computer generated sequence of random numbers, opened just before the start of surgery. The patients in control group (group C) were scheduled to receive inj. Lignocaine (Xylocard, ASTRA ZENECA INDIA LTD) 1.5 mg/kg intravenously over a period of 5-10 seconds and patients in study group (Group S) were scheduled to receive Lignocaine (Xylocard, ASTRA ZENECA INDIA LTD) 1.5 mg/kg intravenously over a period of 5-

10 seconds plus one metered spray (400µg per spray) of Nitroglycerine (NITROCIN, SAMARTH PHARMA PVT.LTD)lingually.

After a detailed pre anaesthetic evaluation, all patients were kept NBM for at least 6 hours before surgery. On night before surgery tablet alprazolam 0.5 mg and ranitidine 150 mg were given. All antihypertensive drugs were continued up to the morning of surgery except ACE inhibitors. Routine monitoring consisting of ECG, BP, & pulse oximetry were used and patient's base line HR, SBP, DBP, MAP and SPO<sub>2</sub> were recorded.

After taking peripheral intravenous line, crystalloid infusion (8ml/kg) was started and premedication was done with glycopyrrolate (0.2mg), ondansetron (4mg) and fentanyl (2mcg/kg) intravenously. Preoxygenation was done for 3 min and anaesthesia induced with injection propofol (2mg / kg) until loss of verbal response and muscle relaxation done with rocuronium (0.9mg/kg) over a 15 seconds period. Immediately after induction lignocaine (1.5 mg/kg) was given intravenously in control group C and lignocaine (1.5 mg/kg) intravenously plus nitroglycerine one metered dose (on the tongue) in study group S. After 60sec laryngoscopy was attempted by an experienced anaesthesiologist. If laryngoscopy time exceeded 30 seconds or multiple attempts were required for intubation, patient was excluded from study.

After confirmation of endotracheal tube position with help of EtCO<sub>2</sub> measurement, anaesthesia was maintained using 60% N<sub>2</sub>O in 40%O<sub>2</sub>, isoflurane and intermittent doses of rocuronium.

SBP, DBP, MAP and HR were recorded as baseline (T<sub>1</sub>), just before intubation (i.e. 60 sec after NTG spray) (T<sub>2</sub>), immediately after intubation (T<sub>3</sub>), at 1min (T<sub>4</sub>), 2min (T<sub>5</sub>), 5min (T<sub>6</sub>), and 10min (T<sub>7</sub>) after intubation. The surgery was allowed to commence thereafter. This was done to negate the influence of surgical stimulus on hemodynamic parameters. Rate pressure product (RPP) was calculated at each time interval by multiplying SBP and HR.

Data were analysed using MS Excel and Epilnfo 6 system. The data related to patient distribution according to age, weight, indication for surgery, type of surgery were presented as number (proportion) and compared by using Pearson chi-square test. All parameters like HR, SBP, DBP, MBP and RPP were expressed as mean $\pm$ SD and compared using student t-test and Pearson's chi-square test.

## Results

The patients in both groups were comparable in age, weight, gender, distribution of surgeries and duration of laryngoscopy.

A significant increase in HR occurred in Group S at 1 min 104.77 $\pm$ 14.9 and 10 min 107.37 $\pm$ 13.3 when compared to Group C at 1 min 112.7 $\pm$ 13.9 and 10 min 93.63 $\pm$ 7.72 post laryngoscopy (P=0.710 and 0.004 respectively). **Fig.1**

The mean arterial pressure was significantly greater in Group C 1 min 111.93 $\pm$ 7.27 and 2 min 109.07 $\pm$ 6.84 when compared to Group S at 1 min 106.17 $\pm$ 4.36 and 2 min 103.63 $\pm$ 3.99 (P=0.007 and 0.004 respectively). **Fig.2**

There was no significant difference in the RPP amongst the two groups at all period of observation (Table 1).

Time interval	RPP(Mean $\pm$ SD)		P value
	Group C (n=30)	Group S (n=30)	C/S
T <sub>1</sub> : Baseline (Before Premedication)	11480 $\pm$ 1167.1	11414 $\pm$ 1372.6	0.387

T <sub>2</sub> : Before Intubation (1 min after induction & study drug)	11646±1357.9	11667±1961.6	0.052
T <sub>3</sub> : Just after Intubation (0 Min.)	13985±1977.51	13233±2122.9	0.705
T <sub>4</sub> : 1 Min after Intubation	16553±2725.3	14310±2232.7	0.288
T <sub>5</sub> : 2 Min after Intubation	15748±2651.2	14413±2037.5	0.162
T <sub>6</sub> : 5 Min after Intubation	13620±1591.2	13991±1876.9	0.378
T <sub>7</sub> : 10 Min after Intubation	12338±1196.9	13689±1683.3	0.071

(Data are expressed in mean±SD, range; test used-student t test)

Table 1: Comparison of changes in rate pressure product (RPP) at various time intervals in Group C and S

## Discussion

Laryngoscopy and tracheal intubation are universally recognized as one of the most noxious stimuli occurring during general anaesthesia and surgery and result in exaggerated sympathetic response (an increase in blood pressure, tachycardia and blood sugar) due to catecholamine release.

Hypertensive patients show an enhanced hemodynamic response to laryngoscopy and tracheal intubation. However, regardless of the preoperative blood pressure control, many patients with hypertension display an accentuated hypotensive response to induction of anaesthesia, followed by an exaggerated hypertensive response to endotracheal intubation.

This response was first described by Reid and Brace in 1940.<sup>5</sup> In normotensive individuals, the average increase in blood pressure is 40-50% while that in the heart rate is 20%, the peak effect occurring one minute after tracheal intubation.<sup>6</sup>

Several potential life threatening conditions including myocardial ischemia and cerebrovascular accident can be reduced by attenuation of this response with use of several pharmacological agents (eg. local anaesthetic like lignocaine,<sup>7</sup> alfentanil,<sup>8</sup> fentanyl,<sup>8</sup> remifentanyl,<sup>8</sup> nifedipine,<sup>9</sup> betablockers,<sup>3</sup> verapamil,<sup>10</sup> diltiazem,<sup>10</sup> gabapentin,<sup>11</sup> magnesium sulphate,<sup>12</sup> nicardipine<sup>13</sup>). All of these techniques have disadvantages related to either cardiovascular or respiratory depression; none directly inhibits the release of catecholamines.

Lignocaine also has direct myocardial depressant effect, peripheral vasodilating effect and the effect on synaptic transmission.<sup>7,14</sup>

Glyceryltrinitrate (NTG) is a vasodilator predominantly venous over arterial dilation. Due to venodilation it decreases the preload and blunts the hypertensive response of intubation reflex. In the patients with low cardiac output and moderately elevated vascular resistance it seems to be the best choice.<sup>14</sup>

NTG has been administered by intranasal route,<sup>16</sup> intravenous bolus<sup>17</sup> and i.v. infusion<sup>18,19</sup> to attenuate tracheal intubation induced hypertensive response and favourable results have been reported. Recently NTG lingual pump spray, or pen spray have been introduced, for spraying on to or under tongue. Its use has been recommended during an anginal attack; it may also be used 5 to 10 min prior to engaging in activities which might provoke an acute attack. NTG spray is easy to use and seems cost effective because there are approximately 70 metered sprays of NTG per pen spray.<sup>20</sup>

The present study was an attempt to find out the effectivity of NTG spray in blunting the pressor response to intubation in hypertensive patients.

In order to eliminate the pressor response to surgical stimuli, the surgery was allowed to commence 10 min after intubation. This ensured that the haemodynamic changes reflected were only due to laryngoscopy and intubation.

Furthermore lignocaine was administered in both groups to ensure that all patients were given the benefit of obtundation of the pressor response. A significant increase in HR occurred in Group S at 1 min  $104.77 \pm 14.9$  and 10 min  $107.37 \pm 13.3$  when compared to Group C at 1 min  $112.7 \pm 13.9$  and 10 min  $93.63 \pm 7.72$  post laryngoscopy ( $P=0.710$  and  $0.004$  respectively).

The mean arterial pressure was significantly greater in Group C 1 min  $111.93 \pm 7.27$  and 2 min  $109.07 \pm 6.84$  when compared to Group S at 1 min  $106.17 \pm 4.36$  and 2 min  $103.63 \pm 3.99$  ( $P=0.007$  and  $0.004$  respectively).

We have used the RPP as a measure of pressor response because it is the index which best correlates with myocardial  $O_2$  consumption ( $MVO_2$ ) and is therefore the critical one in defining response of coronary circulation to myocardial metabolic demands. RPP is also an important indicator of ventricular functional status.

Usually, invasive methods are used to determine the oxygen consumption ( $VO_{2max}$ ) of an organ by collecting blood sample and subjecting it for blood gas analysis which is a tedious, time consuming and risky process. But determination of RPP is a very handy, non-invasive, simple, reliable and reproducible method of knowing  $VO_{2max}$  and serving the same purpose.

The present study has shown that the use of NTG spray along with lignocaine does not result in sustained suppression of the pressor response to laryngoscopy and when compared with lignocaine alone.

However the use of the NTG did result in decrease in MAP at 1 and 2 min post laryngoscopy when compare to lignocaine alone, along with increase in HR at 1 min. The increase in HR and

decrease in MAP can be explained by the pharmacological action of NTG confirm to earlier findings reported by Fassoulaki<sup>16</sup> and Dich-Nielsen et al.<sup>21</sup>

Similar results were also reported by Mikawa et al<sup>18</sup>they concluded that a single, rapid IV dose of nitroglycerin is a simple, practical, effective, and safe method to attenuate the hypertensive response to laryngoscopy and tracheal intubation whereas Grover et al<sup>22</sup> found no change in HR post laryngoscopy and intubation in hypertensive patients pretreated with intranasal NTG .This may be because all in their study were on B-blockers.

Our study did not find any reduction in RPP in NTG group when compared to control group. These findings differ from those of Mikawa et al<sup>18</sup> and Dich-Nielsen et al<sup>21</sup> both of whom have reported a significant reduction in the increase in RPP associated with laryngoscopy and tracheal intubation by the use of I.V. or topical NTG. However it must be kept in mind that the patients enrolled in their studies were normotensive while in our study were hypertensive. This may indicate towards differential effect of NTG on normotensive and hypertensive patients.

One limitation of the present study is the use of Non-invasive method of measuring BP. The use of invasive BP monitoring might have brought to light any possible existing difference in the two groups that we have failed to find.

## **Conclusion**

The present study failed to demonstrate any significant reduction in the pressor response to laryngoscopy and intubation as measured by RPP in controlled hypertensive patients by addition of NTG spray to lignocaine when compared to lignocaine alone.

However, the addition of one puff of (400 µg) NTG spray to lignocaine may offer some benefit in patients at an increased risk of advanced cardiovascular events due to a transient decrease in MAP.



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## **A STUDY ON RELATION OF SUBCLINICAL HYPOTHYROIDISM DURING PREGNANCY WITH ITS OUTCOMES IN GUJARAT.**

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### **ABSTRACT**

**INTRODUCTION:** Pregnancy is a period that places great physiological stress on both the mother and the fetus. When pregnancy compounded by endocrine disorders such as hypothyroidism, the potential for maternal and fetal adverse outcomes can be immense. Screening for subclinical hypothyroidism is essential in all pregnant women, especially in the Indian context, as Indian women have increased risk of developing iodine deficiency during pregnancy. Hence, this study planned to evaluate the effect of subclinical hypothyroidism on pregnancy outcomes.

**METHOD:** It was a prospective analytical study. Sample size consisted of 73 pregnant women attending antenatal OPD. Thyroid profile (serum TSH, FT3 and FT4) was done during first visit. The results analyzed and SCH decided as per trimester specific cutoffs: TSH >2.5mIU/L in 1st trimester, >3mIU/L in 2<sup>nd</sup> trimester and >3.5mIU/L in 3rd trimester. Information regarding general characteristics of participants recorded. The participants followed up to assess the mode of delivery, maternal and fetal outcome and any associated co-morbidities. Women with SCH treated accordingly.

**RESULTS:** Seventy-three antenatal women underwent thyroid screening, of them 24.7% had subclinical hypothyroidism. Proportion of SCH women having age less than 25 years was 55.6% compared to 72.3% in euthyroid women. No significant difference observed between

SCH and euthyroid groups for iodized salt consumption, type of diet and BMI ( $p>0.05$ ). Compared with euthyroid status, SCH was associated with higher rates of High blood pressure (HBP) (27.8% vs 7.3%,  $p=0.02$ ) and Low birth weight among babies (38.9% vs 14.5%,  $p=0.03$ ). Proportion of Anaemia and Poor APGAR score was also high in SCH women compared to euthyroid. However, the significance was only marginally high. (Anaemia- 72.2% vs 45.5%,  $p=0.049$ ; Poor APGAR score- 27.8% vs 9.1%,  $p=0.045$ ).

**CONCLUSION:**Prevalence of subclinical hypothyroidism among pregnant women is fairly high among Indians. Pregnant women with SCH had unfavourable maternal and fetal outcomes specifically there is an increased risk of high blood pressure and low birth weight babies. Thus, routine maternal thyroid function testing is necessary to improve maternal and perinatal outcomes.

**KEY WORDS:** Subclinical hypothyroidism, Pregnancy, Maternal outcome, Fetal outcome

### **INTRODUCTION:**

Thyroid dysfunction is the second most frequent endocrine disease among reproductive-aged women.<sup>1</sup> Pregnancy is a period that places great physiological stress on both the mother and the fetus. If pregnancy compounded by endocrine disorders such as hypothyroidism, the potential for maternal and fetal adverse outcomes can be immense. Hypothyroidism during pregnancy is usually asymptomatic, especially when subclinical.

Hypothyroidism during pregnancy increases the risk of abortion, gestational hypertension, anemia, abruptio placenta and postpartum hemorrhage.<sup>2-4</sup> Untreated maternal hypothyroidism can lead to preterm birth, low birth weight, and respiratory distress in the neonate. Enough evidence has accumulated over the years about the role of thyroxin in normal development of the fetal brain. Neurological deficits in infants and juveniles, including low intelligence quotient scores, cognitive delay, and psychomotor development impairment, are the main complications induced by maternal hypothyroidism during pregnancy.<sup>5-7</sup>

The prevalence of hypothyroidism in pregnancy varies from 0.4% to 11% worldwide.<sup>8</sup> In India, prevalence rates of hypothyroidism during pregnancy ranging from 4.8% to 11% and SCH is as high as 13.5%.<sup>2, 9-10</sup> The rate of detection, especially in a developing country like India, has not kept pace with the magnitude of the problem. Since hypothyroidism can be easily treated, timely detection and treatment of the disorder could reduce the burden of adverse fetal and maternal outcomes, which are very commonly encountered. Present study designed to find out the prevalence and impact of subclinical hypothyroidism.

### **MATERIALS AND METHODS**

*Design:* Hospital based prospective analytical study.

*Study population:* Study setting selected was antenatal OPD at tertiary care hospital. Every week, Monday and Thursday chosen to enroll the participants. On each day of antenatal OPD, every 10<sup>th</sup> woman coming to the antenatal OPD was enrolled for the study. In case of non-response or any other reason, next woman enrolled for study, provided she fulfill the inclusion criteria. Total 73 antenatal women enrolled for the study.

*Study variables:*

Information regarding general characteristics of participants was recorded. The participants also subjected for clinical examination and laboratory investigations which general and systemic examination, height and weight measurement, blood pressure measurement, hemoglobin estimation, thyroid function tests etc.

Assessment of thyroid function performed by measurement of TSH, FT3 and FT4 levels. European Thyroid Association Guidelines used to classify thyroid function during pregnancy. As per these guidelines, antenatal woman diagnosed as having subclinical hypothyroidism

(SCH) if TSH >2.5mIU/L in 1st trimester, >3mIU/L and >3.5mIU/L in 2nd trimester and 3rd trimester respectively provided normal free T3 and T4. If the TSH was >10.0 mIU/L regardless of the FT4 level, the woman diagnosed as having overt hypothyroidism.

Study participants followed up to assess the maternal outcomes, fetal outcomes and any associated co-morbidities. Women with SCH were treated accordingly and babies born to SCH mothers screened for congenital hypothyroidism.

**Exclusion criteria**

- Pre-existing thyroid disorders
- Patients presenting with symptoms of overt hypothyroidism
- Women with multiple pregnancies

**Ethics statements**

- Ethical clearance was obtained from institutional human ethics committee to conduct the study.
- Study was conducted according to world medical declaration of Helsinki.
- Informed consents obtained from all enrolled subjects prior to the study.
- Privacy of all subjects guaranteed.

**Statistical analysis**

The results for continuous variables expressed as mean +/- SD and for categorical variables as percentages. To compare the means and proportions, chi-square and t-test used with 5% level of significance.

**OBSERVATION AND RESULTS**

In present study, out of 73 women, 55 (75.3%) had TSH and fT4 values within the normal reference ranges in the trimester of testing and were considered to be euthyroid, whereas 18 (24.7%) had high TSH levels coupled with normal fT4 levels and were considered to have sub clinical hypothyroidism (SCH). [Table 1]

**TABLE 1**

Subclinical Hypothyroidism	Number	Percentage
Present	18	24.7
Absent	55	75.3
Total	73	100.0

Table 2 shows maternal general characteristics. Proportion of age less than 25 years found to be 55.6% in women with SCH, and 72.3% in euthyroid women. Difference was not statistically significant (p=0.17). However, on comparing the mean age between two groups, the difference was statistically significant (p=0.02).

Out of 18 SCH women, 15 (83.3%) regularly taking iodised salt in their diet, whereas among euthyroid women (n=55), 45 (81.8%) taking iodised salt. Difference was insignificant. There was no association between Vegetarian/Non-vegetarian diet and SCH (p=0.74). Of the 18 SCH women, 07 (38.9%) had vegetarian diet whereas in euthyroid women 19 (34.5%) had vegetarian diet.

Among SCH women (n=18), 02 (11.1%) were overweight, whereas in euthyroid women (n=55), 03 (5.5%) were overweight. Mean BMI was also more in SCH women (21.1 kg/m<sup>2</sup>) compared to euthyroid women (21.4 kg/m<sup>2</sup>). However, there was no association found between BMI and SCH (p>0.05).

**TABLE 2 General characteristics of study population**

Variable		Sub clinical hypothyroidism(n=18)	Euthyroid(n=55)	p- value
Age (years)	< 25	10 (55.6)	40 (72.3)	0.1736
	>=25	08 (44.4)	15 (27.7)	
	Mean $\pm$ SD	24.3 $\pm$ 4.3	22.1 $\pm$ 3.2	0.0233
Iodized salt consumption	Yes	15 (83.3)	45 (81.8)	0.8840
	No	03 (16.7)	10 (18.2)	
Diet	Vegetarian	07 (38.9)	19 (34.5)	0.7384
	Non-Vegetarian	11 (61.1)	36 (65.5)	
BMI (kg/m <sup>2</sup> )	< 25	16 (88.9)	52 (94.5)	0.4095
	>= 25	02 (11.1)	03 (5.5)	
	Mean $\pm$ SD	21.1 $\pm$ 2.7	21.4 $\pm$ 3.1	0.7146

Maternal and Fetal outcomes are compared in Table 3. Cut –off of 11 gm% was taken to determine anemic status in pregnant woman as per the WHO criteria. Significantly higher proportion of SCH women had anemia (72.2%) compared to euthyroid women (45.5%) [ $p < 0.05$ ]. Mean Hb level was also lower in SCH women (9.7 gm%) compared to euthyroid women (10.0 gm%). Proportion of high blood pressure was significantly higher in women with SCH than in euthyroid women (27.8% vs 7.3%,  $p=0.02$ )

More low birth weight babies delivered in SCH group than euthyroid group (38.9% vs 14.5%). There was a strong association between SCH and LBW ( $p=0.03$ ). However, difference of mean birth weight of babies was not significant (2.6 kg vs 2.7 kg,  $p=0.43$ )

Poor APGAR score (< 7) was more in SCH women (27.8%) than euthyroid women (9.1%) at 1 minute after delivery of baby. There was significant association between SCH in mother and poor APGAR of baby ( $p < 0.05$ )

**Table 3 Maternal and Fetal outcomes**

Variable		Sub clinical hypothyroidism(n=18)	Euthyroid (n=55)	p- value
Hb (gm%)	<11	13 (72.2)	25 (45.5)	0.0485
	11 or more	05 (27.8)	30 (54.4)	
	Mean $\pm$ SD	9.7 $\pm$ 1.3	10.0 $\pm$ 1.2	0.3701
High Blood Pressure (SBP>140 and/or DBP>90)	Yes	05 (27.8)	04 (7.3)	0.0216
	No	13 (72.2)	51 (92.7)	
Birth Weight (kg)	< 2.5	07 (38.9)	08 (14.5)	

	<b>2.5 or more</b>	11 (61.1)	47 (85.5)	0.0265
	<b>Mean <math>\pm</math> SD</b>	2.6 $\pm$ 0.5	2.7 $\pm$ 0.3	0.4312
<b>APGAR Score (at 1 minute)</b>	<b>&lt; 7</b>	05 (27.8)	05 (9.1)	0.0454
	<b>7 or more</b>	13 (72.2)	50 (90.9)	

## DISCUSSION

Subclinical hypothyroidism (SCH) is the commonest form of hypothyroidism in pregnancy; it comprises of high thyroid-stimulating hormone (TSH) with thyroxin (T4) levels in normal or low normal range.

If the TSH is greater than 2.5 at any time during pregnancy, T4 levels should be checked to determine whether the hypothyroidism is overt or subclinical. If T4 is low, the diagnosis is overt hypothyroidism, which can impair the infant's neurocognitive development. There are also increased risks for premature birth, low birthweight, and miscarriage. Overt hypothyroidism must be treated. If TSH is high and the T4 is normal, the diagnosis is subclinical hypothyroidism. In this case, the next step is to check for antithyroid peroxidase antibodies. Women who are antibody positive should be treated. The effect of subclinical hypothyroidism on fetal neurocognitive development is not clear. But one large study showed lower IQ tests in the children of untreated women. Treatment is necessary when TSH is 10 or more, regardless of the T4 level. In addition, TSH should be monitored every 4 weeks during the first 20 weeks of gestation, then once again between 26 and 32 weeks.<sup>11</sup>

The current study performed to gain insight into the impacts of SCH on maternal and perinatal outcomes. In our study sample, 24.7% of pregnant women were diagnosed with SCH.

Forough et al<sup>12</sup> in the year 2012 conducted a study on 600 pregnant women in Iran and showed 11.3% prevalence of SCH. Sannaboraiah A et al<sup>13</sup> in their study of 200 antenatal women found 9.5% prevalence of subclinical hypothyroidism. Dhanwalet al<sup>14</sup> in his study showed an SCH prevalence of 4.3% among the pregnant women in north India. Abalovichet al<sup>15</sup> in the year 2007 estimated subclinical hypothyroidism appears to occur in 2-3% of pregnancies. Gayathri et al<sup>16</sup> in the year 2007 analyzed the prevalence of SCH among 495 pregnant women attending Government hospitals in South India and showed that prevalence was 2.8% in her study. Subclinical hypothyroidism identified in 2.3% of the 25,756 antenatal women tested by Brian et al<sup>17</sup> in their study in Texas in year 2000. Liang-Miao Chen et al.<sup>18</sup> in their prospective study on 8012 pregnant women at Third Hospital Affiliated of Wenzhou Medical University, Zhejiang, China, reported that 371 (4.63%) had high TSH levels coupled with normal ft4 levels and were considered to have SCH.

There is a wide variation in prevalence of SCH during pregnancy in different studies with higher prevalence in current study.

**Age and SCH**In present study, SCH women had significantly higher mean age compared to euthyroid ( $p=0.02$ ).Sannaboraiah A. et al<sup>13</sup> also observed positive correlation between subclinical hypothyroidism and higher maternal age ( $p=0.018$ ). The study by Kalpeshet al<sup>19</sup> had similar results i.e., increased maternal age was associated with higher incidence of thyroid dysfunction. Higher mean age among SCH group may be due to that SCH shown to increase with age.

**High blood pressure and SCH**The results of our study suggest an association between subclinical hypothyroidism and increased blood pressure levels (27.8% vs 7.3%,  $p=0.02$ ). Several mechanisms could explain why subclinical hypothyroidism has an adverse effect on blood pressure. Clinical hypothyroidism known to increase blood pressure levels, and the main underlying cause of this thought to be the degree of systemic vascular resistance present in patients with clinical hypothyroidism.<sup>20</sup> Luboshitzky et al found that the prevalence of



hypertension in the subclinical hypothyroidism group was significantly higher than that in the normal control group, supporting our findings.<sup>21</sup> YunfeiCai et al<sup>22</sup> also found association between SCH and increased blood pressure in their meta-analysis of subclinical thyroid dysfunction patients. Similarly Liang-Miao Chen et al<sup>18</sup> also found significantly higher proportion of high blood pressure in women with SCH than in euthyroid women (3.504% vs. 1.819%,  $P=0.02$ ). However, Duanet al<sup>23</sup> and Walsh et al<sup>24</sup> in their cross-sectional study not found significant association between subclinical hypothyroidism and an increase in blood pressure.

**HB and SCH** Hypothyroidism can cause certain forms of anemia, which are usually macrocytic hypochromic, and/ or normocytic. In this study, proportion of anemia was significantly higher in SCH women compared to euthyroid women [72.2% vs 45.5%,  $p=0.048$ ]. Akteret al<sup>25</sup> reported anemia among 17.2% of SCH patients whereas Sannaboraiah A et al<sup>13</sup> found 31.6% anemic patients among SCH group in their studies.

**BMI and SCH** In current study, overweight proportion was more in SCH women compared to euthyroid women. However, mean BMI was lower in SCH group than euthyroid group. There was no association found between BMI and SCH ( $p=0.41$ ). Karthicket al<sup>26</sup> found that patients with SCH represent lower BMI when compared to euthyroid control group. On the contrary, Knudsen et al<sup>27</sup> in the year 2005 found a positive association between BMI and serum TSH ( $P < 0.001$ ). The study by Solanki et al<sup>28</sup> found that individuals with higher BMI had higher levels of serum TSH and that this trend continued from the underweight to the obese group ( $p < 0.001$ ). Hypothyroidism is associated with a moderate increase in weight gain, and it has been described recently that changes in TSH could be result of excess weight<sup>29</sup>.

**LBW and SCH** Incidence of LBW in our study was found to be significantly higher in SCH group compared to euthyroid (38.9% vs 14.5%,  $p=0.03$ ). In Akteret al<sup>25</sup> study also, low birth weight babies were common in patients with subclinical hypothyroidism (27.6%). In Liang et al<sup>18</sup> study, more LBW infants were delivered in the SCH group than in the euthyroid group (4.582% vs. 1.885%,  $P < 0.001$ ). Same association reported by Leung et al<sup>30</sup>. These findings suggest that the increased rate of LBW in infants born to women with SCH is related to this thyroid disorder. Because LBW is reported risk factor for subnormal neurobehavioral performance and intellectual development<sup>31-33</sup>, possible links between LBW in infants born to mothers with SCH and impaired psychological development have been proposed<sup>34-35</sup>.

**APGAR Score and SCH** In present study, incidence of low APGAR Score at 1 minute was significantly higher among SCH women compared to euthyroid women (27.8% vs 9.1%,  $p=0.045$ ). In a study by Sannaboraiah A et al<sup>13</sup>, 9 out of 19 babies had APGAR score less than 7 (47.36%). Foroughet al<sup>12</sup> reported that subclinical hypothyroidism had a significant association with low Apgar score at first minute ( $P = 0.022$ ). It increased the risk of low Apgar score by 2.15 times. Goelet al<sup>36</sup> also showed a higher risk of fetal distress in mothers with subclinical or clinical hypothyroidism. It seems that hypothyroidism exerts irreversible influences on the placenta and fetus during pregnancy and decreases the fetal ability to tolerate stress and therefore, neonates present with low Apgar scores at birth<sup>37</sup>. **Limitation of the study** Thyroid peroxidase antibodies (TPO antibodies) was not determined.

## CONCLUSION AND SUMMARY

The major finding of this study was that SCH, a relatively common disorder in pregnant women, has pronounced effects on maternal and fetal outcomes. Specifically, SCH can lead to HBP in mothers, and higher incidences of LBW in infants. If the condition detected early, it is easy to treat, with very little detriment to the mother and the fetus. Thyroxine replacement in pregnant women suffering from overt or SCH does prevent obstetric and fetal complications and shows no harmful effects of thyroxine therapy. However, without a matched untreated control group,

we cannot conclude that all pregnant women with SCH should be treated with thyroxine.

Therefore, until studies are done to demonstrate that thyroxine supplementation will obviate any of these maternal and fetal morbidities, widespread serum TSH screening and treatment of women with subclinical hypothyroidism during pregnancy is unjustified.

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6

Original article

### **A STUDY OF PORTSMOUTH-POSSUM SCORING IN PREDICTING MORTALITY AND MORBIDITY IN PATIENTS UNDERGOING MAJOR ABDOMINAL SURGERY**

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**Key words : PORTSMOUTH-POSSUM SCORING ,PREDICTING MORTALITY ,MAJOR ABDOMINAL SURGERY**

#### **ABSTRACT**

**Background:** There is a need for an accurate risk scoring system to predict surgical outcomes. POSSUM (Physiological and Operative Severity Score for the enUmeration of Mortality and morbidity) and its modification P-POSSUM use a physiological score and an operative severity score to calculate risks of mortality and morbidity. In present study we have tried to assess the accuracy of P-POSSUM in predicting mortality and morbidity in general surgical patients.

**Methods:** Total 50 Patients, undergoing major general surgical procedures were scored according to their physiological parameters and the intra-operative findings and a final expected mortality rate was calculated using P-POSSUM equation and compared with actual outcomes.

**Result:** The mean P-POSSUM score of the patients, in whom actual morbidity was observed, was found to be 61.82, compared to mean P-POSSUM score in the remaining cases where there was no observed morbidity was 39.51, significantly lower than the previous group (36%). Similarly the mean P-POSSUM score of the patients, in whom actual mortality was observed, was found to be 76.01. Whereas mean P-POSSUM score in the remaining cases where there was no observed mortality was 33.16, significantly lower than the previous group (56%).

**Conclusion:** This study validates the Portsmouth possum scoring system in our setup as a valid means of predicting mortality and morbidity following major surgery. It is a scoring system tailored to assess patients undergoing major surgeries and help in risk assessment of the patients with respect to both mortality and morbidity.

**Key-words:** Portsmouth-Physiological and Operative Severity Score for the Enumeration of Mortality and Morbidity, POSSUM, risk scoring, surgical audit

**Background:**

Mortality and morbidity are important and objective ways of measuring results. However, its raw rates are inadequate to define the quality of resources, management of the resources as well as performance of health care facilities<sup>1</sup>. The basic aim of any surgical procedure is to reduce morbidity and mortality. By comparing the influence on adverse outcome; we can assess the efficiency of that particular procedure and assess the quality of care provided to the patient. Comparison using crude morbidity and mortality rates is fallacious, because of differences in general health of the local population and variable presentation of the patient's condition<sup>2</sup>. The outcome of any surgery doesn't solely depend upon the surgeon's ability. Patient's physiological status, disease that requires surgical intervention, severity of the disease, elective or emergency nature of the surgery etc. also plays a huge role in the ultimate outcome of the surgery. Thence arise the need of risk scoring which may help in the accurate prediction of outcome. An ideal risk scoring system should accurately quantify a patient's risk of adverse outcome early, should be easy to use, fast, and comparable across different patient groups. The simplest and oldest classification being used is the American Society of Anesthesiologists' Physical Status (ASA-PS) classification but has limitations in describing individual risk of complication in postoperative period<sup>3,4</sup>. Risk scoring seeks to quantify a patient's risk of adverse outcome based on the severity of illness derived from data available at an early stage of the hospital stay. The possible outcome of a surgical operation must be determined to cause evolution of more effective treatment regimens<sup>5</sup>.

Different calibrated systems were developed to obtain mortality estimates for various classes of patients in hospital settings. Among these systems is the Physiological and operative severity scoring system for the enumeration of morbidity and mortality (POSSUM), created by Copeland and collaborators as a statistical model to predict the surgery risk. The Physiological and Operative Severity Scoring system for the enumeration of Morbidity and mortality (POSSUM) has been proposed as a risk adjusted scoring system to allow for direct comparison between the observed and expected adverse outcome rates<sup>6,7</sup>. It has been called as a surgeon based scoring system.

Copeland *et al.* developed Physiological and Operative Severity Score for the Enumeration of Mortality and Morbidity (POSSUM) scoring system in hope of providing a retrospective and prospective analysis of surgical mortality and morbidity. They initially analyzed 62 parameters and ultimately improvised to the final set of 12 physiological and six operative factors. The score derived was subjected to multivariate discriminate analysis to get outcome<sup>6,7</sup>. Whitley MS from Portsmouth University demonstrated an over prediction of by a factor of two and suggested use of linear regression analysis to derive a better equation<sup>8</sup>. Thus the Portsmouth POSSUM is a modification of the POSSUM scoring system, incorporating the same variables and grading system, but a different equation, which provides a better fit to the observed mortality rate, which is an important and objective measure of outcome<sup>9</sup>. In the present study, Portsmouth-POSSUM scoring system is applied prospectively to determine how it performs in predicting complications or death in patients undergoing major abdominal surgery.

**Objectives :-**

- ✓ To study Portsmouth POSSUM scoring system in predicting morbidity and mortality in general surgical patients, undergoing major abdominal surgery.
- ✓ To compare the predicted morbidity and mortality rates with actual rates and assess the accuracy of Portsmouth POSSUM system

### **Methodology :-**

Source of Data: Patients undergoing major general surgical procedures, admitted under department of general surgery of AMC MET Medical College, Ahmedabad from January 2017 to December 2017.

Sample Size: 50 Patients.

### **Method of Collection of Data:**

During hospitalization relevant history was collected and appropriate investigations as deemed necessary were done using standard procedures. The patients were then scored according to their physiological parameters and the intra-operative findings and a final expected mortality rate was calculated.

Portsmouth-POSSUM scoring is a two part scoring system that includes physiological assessment as well as measure of operative severity. The physiological part of scoring includes 12 criteria, each divided into 4 grades with exponentially increasing scores, i.e. 1,2,4,8. Highest scores are given to the most deranged values. If a particular variable is not available, score of 1 is allocated. The operative severity part of scoring includes 6 variables; each divided 4 grades with an exponentially increasing score i.e. 1,2,4,8.

Reference tables for Portsmouth-POSSUM scoring system are as follows;

Score	1	2	4	8
Age (years)	≤60	61-70	≥71	
Cardiac signs	Normal	Diuretic, digoxin antianginal or antihypertensive therapy	Peripheral edema, warfarin therapy	Raised jugular venous pressure
Chest radiograph	Normal	—	Borderline cardiomegaly	Cardiomegaly
Respiratory history	Normal	Dyspnea on exertion	Limiting dyspnea (one flight of stairs)	Dyspnea at rest
Chest radiograph	Normal	Mild chronic obstructive airway disease	Moderate COAD	Fibrosis or consolidation
Systolic blood pressure (mmHg)	110-130	131-170 100-109	≥171 90-99	≤89
Pulse (beats/min)	50-80	81-100 40-49	101-120	≥121 ≤39
Glasgow coma scale	15	12-14	9-11	≤8
Hemoglobin (g/dl)	13-16	11.5-12.9 16.1-17	10-11.4 17.1-18	≤9.9 ≥18.1
White cell count ( $\times 10^{12}/l$ )	4-10	10.1-20 3.1-4	≥20.1 ≤3	
Blood urea (mmol/l)	≤7.5	7.6-10	10.1-15	≥15.1
Sodium (mmol/l)	≥136	131-135	126-130	≤125
Potassium (mmol/l)	3.5-5	3.2-3.4 5.2-5.3	2.9-3.1 5.4-5.9	≤2.8 ≥6
Electrocardiogram	Normal		Atrial fibrillation (rate 60-90)	Any other change

COAD: Chronic obstructive airway disease

Table – 1: Physiological Scoring System

Score	1	2	4	8
Operative severity	Minor	Intermediate	Major	Major+
Number of operations within 30 days	1	—	2	>2
Blood loss per operation (ml)	≤100	101-500	501-999	≥1000
Peritoneal contamination	None	Serous fluid	Local pus	Free bowel content, pus or blood
Presence of malignancy	None	Primary only	Nodal metastases	Distant metastases
Mode of surgery	Elective		Emergency resuscitation of >2 h possible, operation <24 h after admission	Emergency (immediate surgery <2 h needed)

Table – 2: Operative Severity Scoring

➤ Portsmouth-POSSUM Equation for Morbidity,

$$\text{Log } A/1-A = -5.91 + (0.16 \times \text{physiological score}) + (0.19 \times \text{operative score})$$

Where A = Risk of Morbidity.

- Portsmouth-POSSUM Equation for Mortality,

$$\text{Log B/1-B} = -9.065 + (0.1692 \times \text{Physiological score}) + (0.1550 \times \text{Operative Score})$$

Where B = Risk of Mortality.

### **Inclusion Criteria:-**

- ✓ Any patient undergoing major or supra-major abdominal surgery.

### **Exclusion Criteria:-**

- ✓ Age < 12 years.
- ✓ Day-care surgeries.
- ✓ Patient which were lost in follow-up period.

### **Result:-**

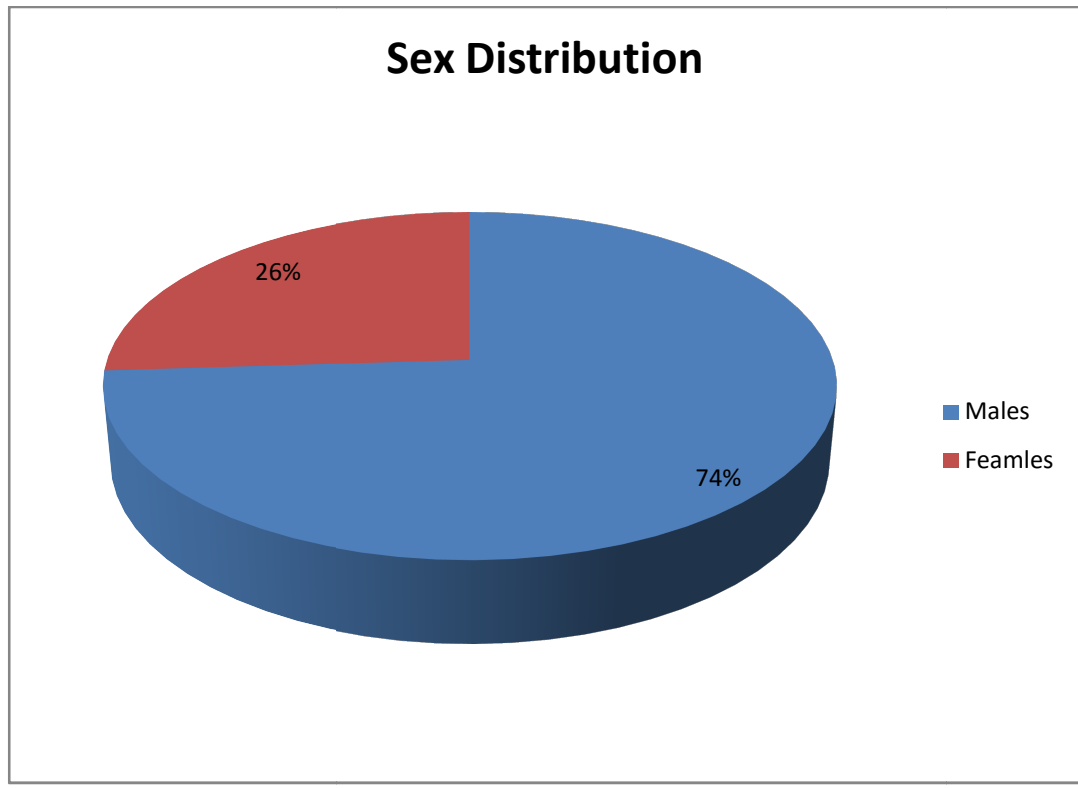
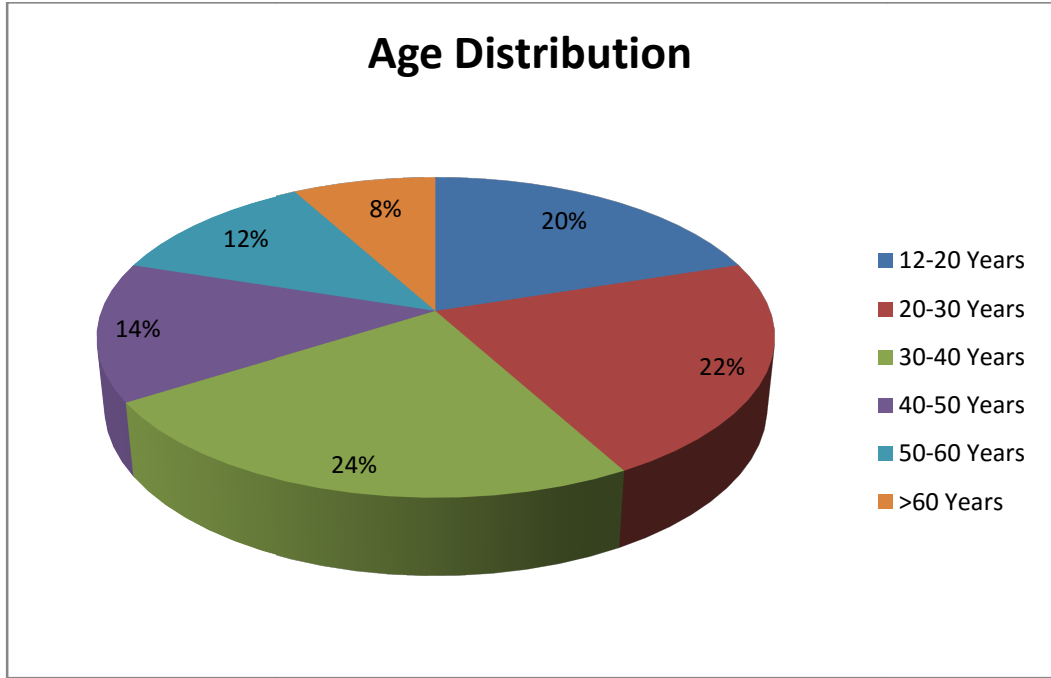
A total of 50 patients admitted for emergency as well as elective major and supra-major surgery were studied. Mean age of these patients was 40 years. 76% of patients were male and M:F ratio was 2.84:1. Majority (62%) procedures were emergency surgeries. Certain case (6%) were immediate emergency, in which resuscitation for >2 hours was not possible. While the rest surgeries (20%) were elective. Perforation of hollow viscus presented with pneumoperitoneum was the most common indication for surgery. Other indications included intestinal obstruction, penetrating abdominal trauma, acute appendicitis and others.

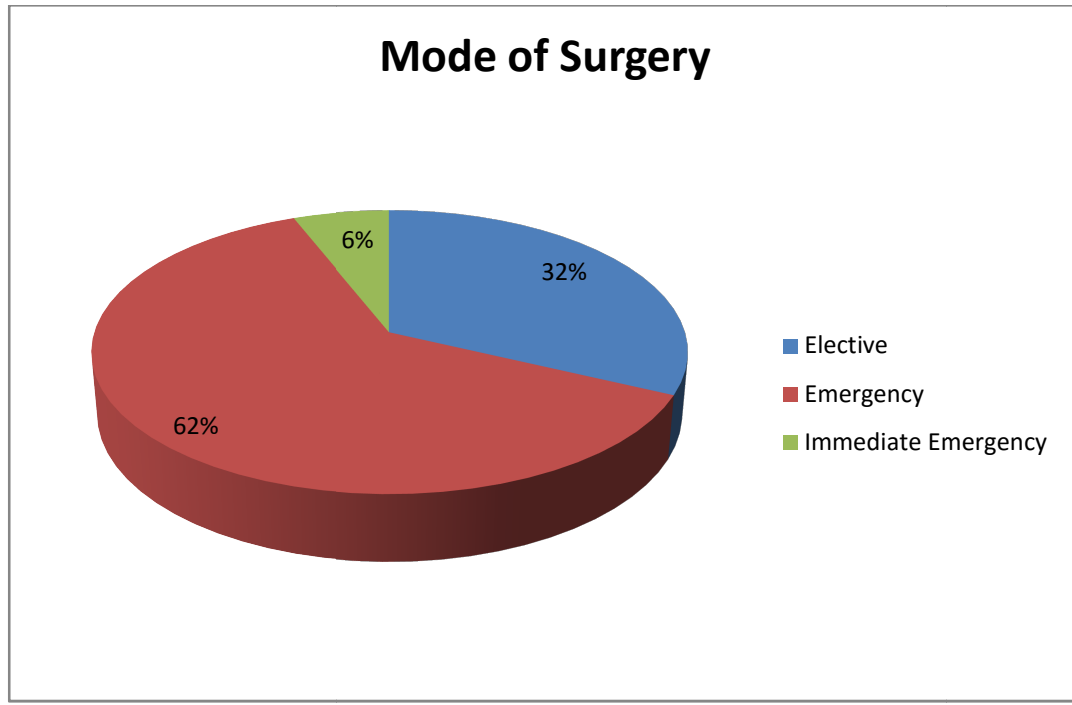
### **Demographic Profile:**

Demographic profile of the patients is tabulated as follows;

<b>Age Range</b>	<b>Number of Patients</b>
<b>12-20 Years</b>	10 (20%)
<b>20-30 Years</b>	11 (22%)
<b>30-40 Years</b>	12 (24%)
<b>40-50 Years</b>	7 (14%)
<b>50-60 Years</b>	6 (12%)
<b>&gt;60 Years</b>	4 (8%)

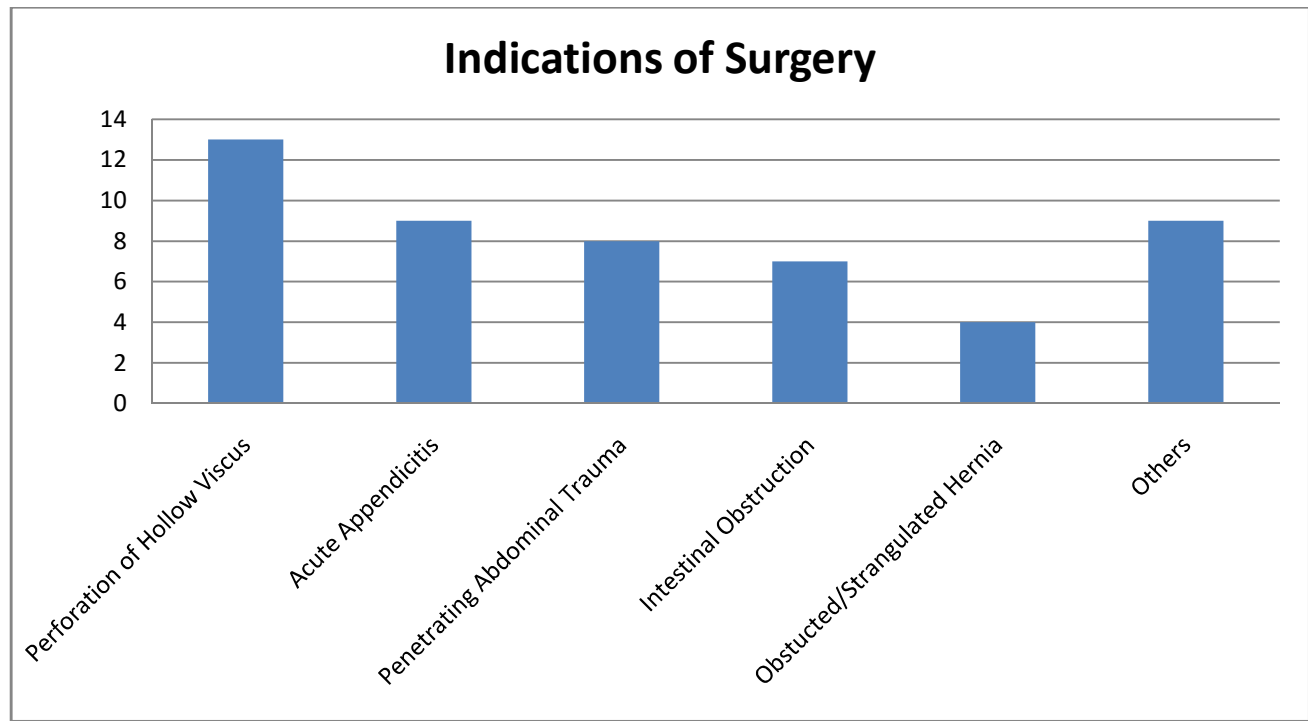






#### Indications of Surgery:

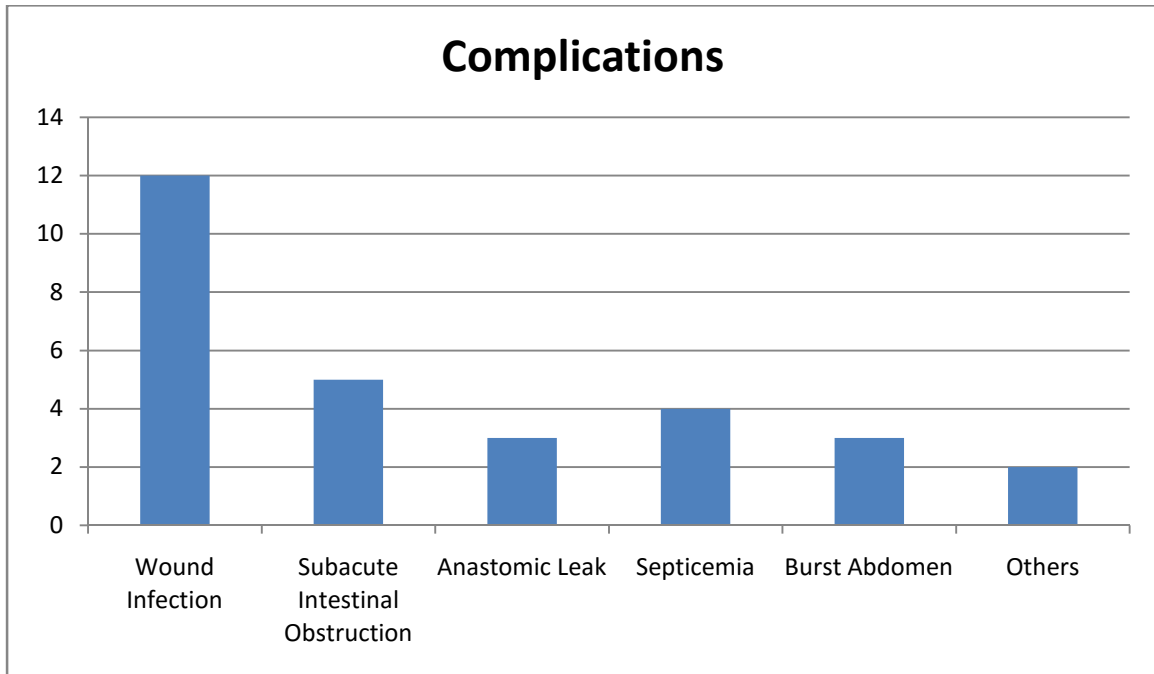
<u>Indications of Surgery</u>	<u>Number of Cases</u>
Perforation of Hollow Viscus	13 (26%)
Acute Appendicitis	9 (18%)
Penetrating/Blunt Abdominal Trauma	8 (16%)
Acute/Subacute Intestinal Obstruction	7 (14%)
Obstructed/Strangulated Hernia	4 (8%)
Others	9 (18%)



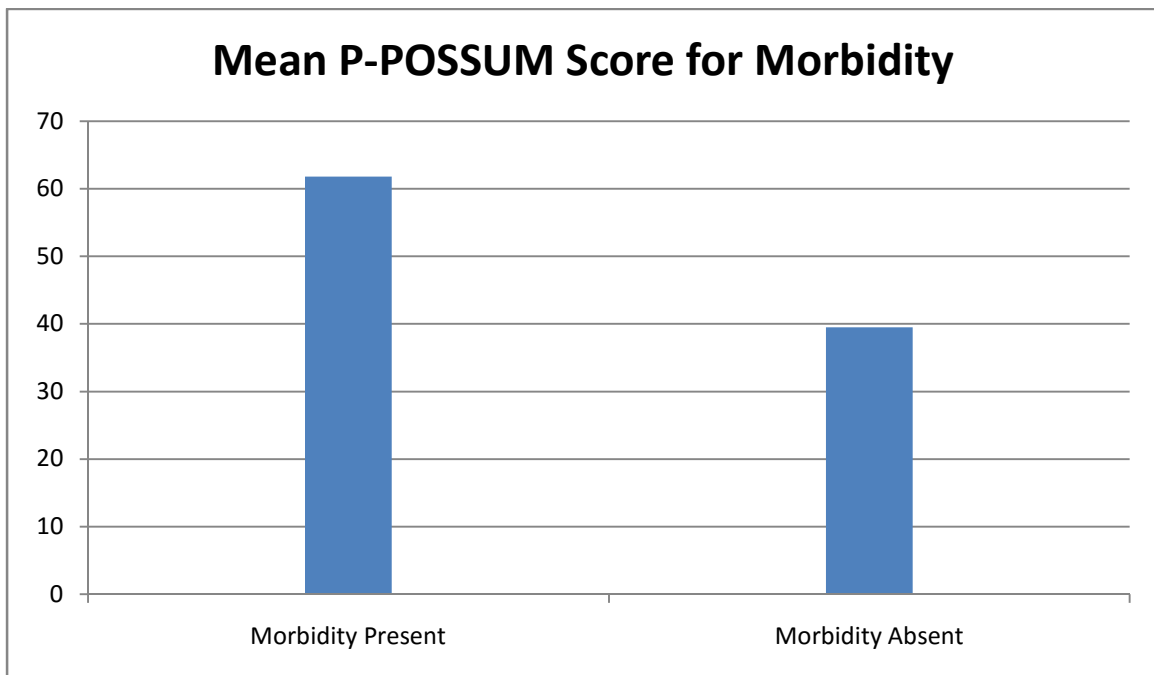
#### Prediction of Morbidity:

Most common complication encountered was wound infection, followed by subacute intestinal obstruction. Other morbidity include Anastomic leak, septicemia, burst abdomen, renal failure etc.

Complication	Number of Cases
Wound Infection	12 (41%)
Subacute Intestinal Obstruction	5 (17%)
Septicemia	4 (14%)
Anastomic Leak	3 (10%)
Burst Abdomen	3 (10%)
Others	2 (7%)

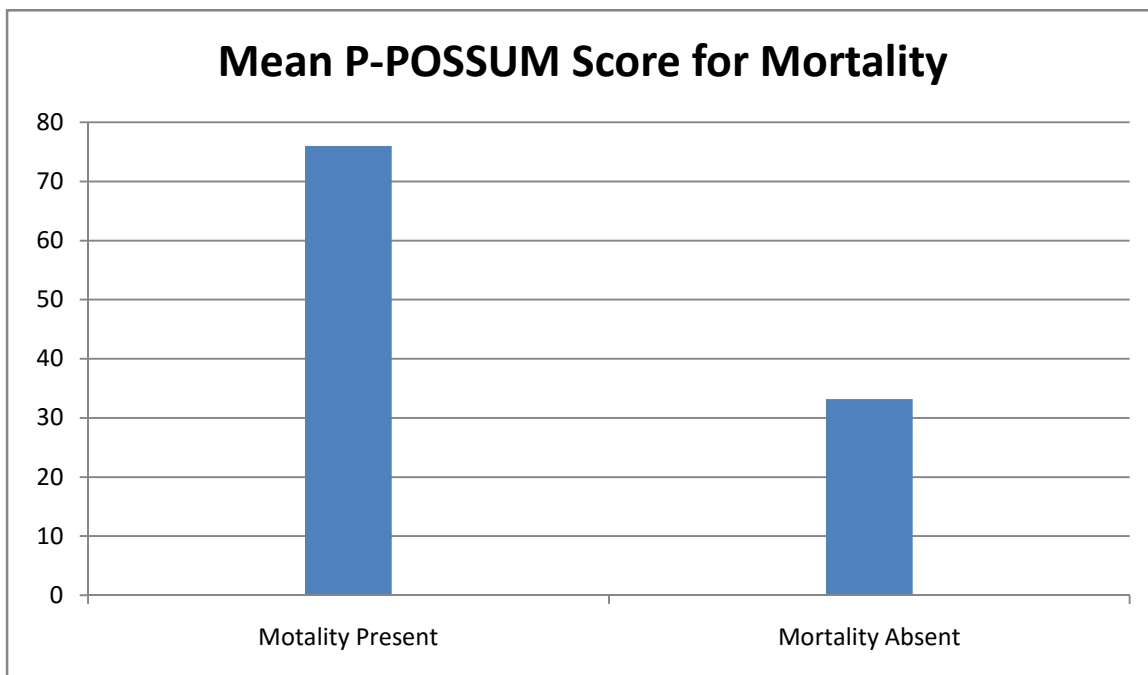


Among the 50 cases studied, various complications were seen in total 29 number of cases. So, crude morbidity rate observed to be 58%. The mean P-POSSUM score of the patients, in whom actual morbidity was observed, was found to be 61.82. Whereas mean P-POSSUM score in the remaining cases where there was no observed morbidity was 39.51, significantly lower than the previous group (36%).



### **Prediction of Mortality:**

Among the 50 cases studied, Mortality was seen in total 7 patients. So, crude mortality rate observed among to be 14%. The mean P-POSSUM score of the patients, in whom actual mortality was observed, was found to be 76.01. Whereas mean P-POSSUM score in the remaining cases where there was no observed mortality was 33.16, significantly lower than the previous group (56%).



### **Discussion:-**

Despite advancement in surgical technique and critical care facilities, high-risk surgical procedures are associated with substantial mortality<sup>10</sup>. As per WHO global estimates, approximately 1–5 million postoperative deaths occur per year, and postoperative morbidity is expected to be 5–10 times this rate<sup>11</sup>. Herein comes the role of surgical audit as it is only by comparing the occurrence of an adverse outcome we can assess the safety and efficacy of a particular procedure<sup>12</sup>. Risk scoring measurement can help in standardization and evolution of more effective treatment regimens. Simple scoring systems using fewer variables and simple equations often compromise accuracy, whereas a complex system with many variables and complex equations may achieve precision but compromise ease of use. Thus, in an ideal system, there should be a balance between ease of use and accuracy. Numerous scoring systems are available such as ASA-PS<sup>13</sup>, Goldman's index<sup>14</sup>, Charlson's score<sup>15</sup>, Acute Physiology and Chronic Health Evaluation (APACHE-I & APACHE-II) etc. But each has its own pros and cons<sup>16</sup>.

POSSUM, in essence, is a surgeons scoring system as it includes parameters accounting for operative severity. In this study, significant differences were noted in P-POSSUM scores of patients with healthy recovery and patients, who developed post-operative complications and even death, validating P-POSSUM score in our setup as a reliable risk scoring system.

The efficacy of Portsmouth-POSSUM scoring system is well-proven across various surgical set-ups too as shown by different studies<sup>17,18,19,20</sup>.

Ying *et al.* suggested some drawbacks of POSSUM like different definitions of postoperative complications result in different settings, issue of missing data, difficulty in establishing the classification of electrocardiography abnormalities and the exact operative blood loss<sup>21</sup>. Furthermore, liver dysfunction, blood glucose, nutritional status etc., which are often detrimental in outcome of surgery are not included in parameters of P-POSSUM scoring<sup>22</sup>.

### **Conclusion:-**

This study validates the Portsmouth possum scoring system in our setup as a valid means of predicting mortality and morbidity following major surgery. It is a scoring system tailored to assess patients undergoing major surgeries and help in risk assessment of the patients with respect to both mortality and morbidity. Both POSSUM and P-POSSUM are available as online calculators, thus speeding up the calculation process making them extremely easy to use. Hence this can be used to improve the quality of care provided by focusing on improving the score by improving the said parameters for each patient. A fairly accurate prediction can be made pre-operatively with regards to the risk of mortality to the patient.

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Original article

### **STUDY OF DYSLIPIDEMIA AND ABNORMAL LIPID PROFILE IN DIABETES MELLITUS PATIENTS AND ITS ASSOCIATION WITH INCREASED MORBIDITY.**

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**Key words: DYSLIPIDEMIA AND ,DIABETES MELLITUS PATIENTS ,ASSOCIATION WITH MORBIDITY**

#### **ABSTRACT:**

**Introduction:**Diabetes Mellitus is a heterogeneous group of metabolic disorder characterized by chronic hyperglycemia with disturbance of carbohydrate, fat and protein metabolism resulting from defect in insulin secretion, insulin action or both. The two broad categories of DM are Type 1 & Type 2. Due to paucity of dramatic symptoms, poor health awareness & the prevailing socio-economic condition type 2 diabetes frequently goes undiagnosed for many years and such patients are at increased risk of developing macro-vascular and micro-vascular complications(1). This was clearly seen in UK Prospective Diabetes Study where 50% of patients had diabetic complications at presentation (3). Lipid abnormalities play an important role in causation of diabetic atherosclerosis (4, 5) and contribute significantly to complication of diabetes.

**Materials & Methods:** A prospective analytical study of 200 patients was undertaken at Department of Internal Medicine, AMC MET MMC Ahmedabad. Prior approval by IRB of AMC MET MMC was taken. Patients presenting to OPD were analyzed in terms of Age, Sex & Obesity related to dyslipidemia & data analyzed using Paired T test with reference study.



**Observations:** Mean age of study population was 54 yrs. Male patients were 54.55 yrs & females were 54.80 yrs mean age. Abnormal HDL 80%, LDL 57%, VLCL 56%, Cholesterol in 37% were found. 66% of pts had BMI > 25 & were classified as obese.

**Conclusions:** Majority of patients were 40-60 yrs age group which is a high risk age group for development of atherosclerosis & cerebrovascular events & of them >50% of pts were having altered lipid profile which is a significant risk factor for morbidities related to diabetes. Hence control of dyslipidemia in diabetics with lipid lowering agents should be given due consideration when planning a treatment regimen.

**KEYWORDS:** Dyslipidemia, Diabetes Mellitus, Lipoproteins, Abnormal Lipid Profile.

**INTRODUCTION:** Diabetes is a growing health problem throughout the world. Diabetes is now among the five leading causes of death due to disease in most countries (2). It was estimated that 194 million people were likely to have diabetes globally in 2003 i.e. about 5.1 % of the world population. By the year 2025, the total number of people with diabetes is projected to reach 330 million worldwide. The region most likely to experience the main burst of epidemic is Asia (2). Diabetes has emerged as a major healthcare problem in India. According to Diabetes Atlas published by the International Diabetes Federation (IDF), there were an estimated 40 million persons with diabetes in India in 2007 and this number is predicted to rise to almost 70 million people by 2025. Patients with type 2 diabetes usually have insulin resistance and relative rather than absolute insulin deficiency. At the time of diagnosis and often throughout their lifetime these patients don't need insulin treatment to survive, although ultimately it may be required for glycemic control. This form of diabetes is associated with progressive  $\beta$  cell failure with increasing duration of diabetes. In India it seems to occur a decade earlier as compared to the West. Due to paucity of dramatic symptoms, poor health awareness & the prevailing socio-economic condition type 2 diabetes frequently goes undiagnosed for many years and such patients are at increased risk of developing macro-vascular and micro-vascular complications(1). This was clearly seen in UK Prospective Diabetes Study where 50% of patients had diabetic complications at presentation (3). Lipid abnormalities play an important role in causation of diabetic atherosclerosis (4, 5) and contribute significantly to complication of diabetes. Lipid abnormalities in patients with diabetes are likely to play important role in the development of atherogenesis. A study was undertaken at AMC MET MMC Ahmedabad from Sept 2016 to March 2017 to assess the incidence of dyslipidemia in diabetes mellitus patients presenting to Dept of internal medicine and whether age and sex of the patient affect the extent of dyslipidemia and its effects on morbidity due to diabetes mellitus.

**AIMS & OBJECTIVES:** A study of 200 patients was conducted at Department of Internal Medicine, AMC MET MMC Ahmedabad from Sept 2016 to March 2017 with following objectives.

To study the prevalence of lipid abnormalities in diabetic patients.

To identify and characterize lipid and lipoprotein abnormalities associated with diabetic patients.

To compare dyslipidemia in male and female diabetics.

To compare dyslipidemia in obese and non-obese diabetics.

**MATERIALS & METHODS:** A total of 200 patients presenting to OPD of Dept of Internal Medicine during period Sept 2016 to March 2017 were included in the study. Study was presented at biennial meeting of Institutional Review Board and approved.

**INCLUSION CRITERIA FOR STUDY:**

1. Patients with established diabetes mellitus diagnosed as per WHO criteria.(76)
  - Symptoms of diabetes: RBS  $\geq$  200 mg/dl or
  - FBS  $\geq$  126 mg/dl or
  - Two hour plasma glucose  $\geq$  200 mg/dl during oral GTT.
2. Age of patients was 12 years onward.

Systemic disease like hypertension, chronic renal failure, nephritic syndrome, myxoedema, systemic lupus erythematosus were excluded from the study on the basis of history, clinical examination and relevant previous investigations. Pregnant females and patients with various endocrinal disorders were excluded. Patients were screened for obesity by BMI. BMI  $\geq$  25 was considered as obese.

All patients were subjected to following laboratory investigation-

- a) Fasting lipid profile
- b) Fasting and postprandial blood sugar levels.
- c) S. Cholesterol
- d) S. Triglyceride
- e) S. HDL
- f) VLDL- C
- e) S. LDL

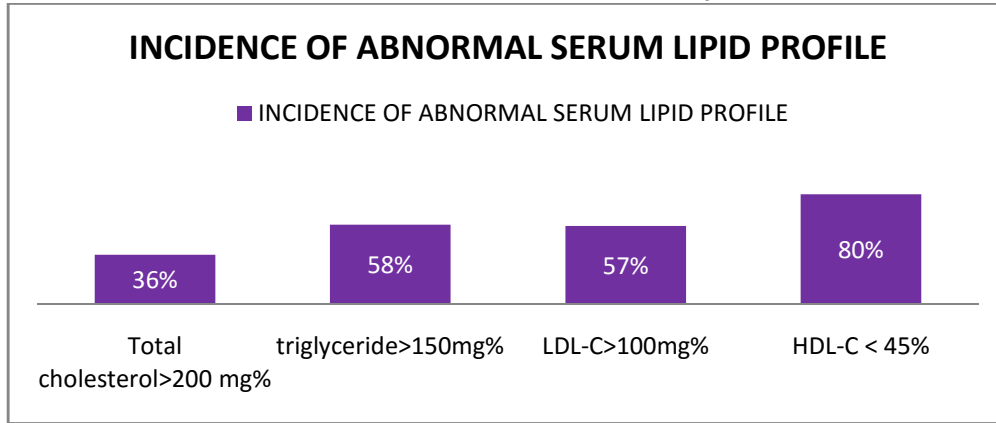
Cut off values for abnormal lipid levels were taken as Adult treatment panel-3 guidelines. Data was compiled and analyzed using multi variate and bi variate analysis percentages.

**OBSERVATIONS:**

1. Mean age of study population was 54 yrs. Mean age of male patients was 54.55 yrs & females was 54.80 yrs. Incidence increased from 5th decade(19%) and become maximum in 6th and 7th decade(26% each). As compared to males, incidence of diabetes in female is low(17.64%) in 5th decade but rises to 29.41% in 6th decade and 26.41% in 7th decade similar to male incidence, as female hormonal advantage over

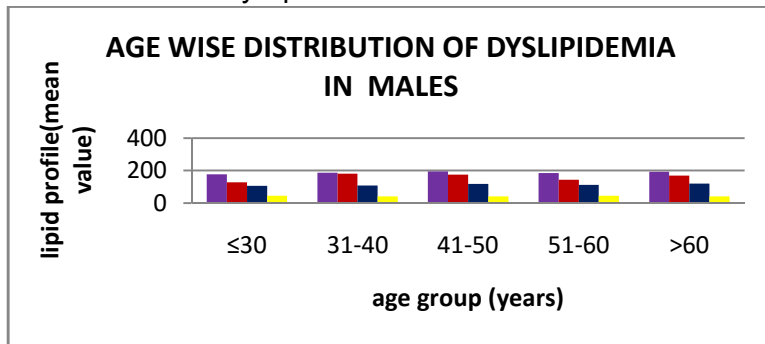
males is gone in this age group due to menopausal state. Menopause promotes the development of android pattern obesity which increases insulin resistance and subsequent increase in incidence of diabetes. Incidence in individuals 70 years or older did not increase further, most likely as a result of higher mortality in this age group diabetes than in those without diabetes.

2. Distribution of abnormal lipid profile values in our study:

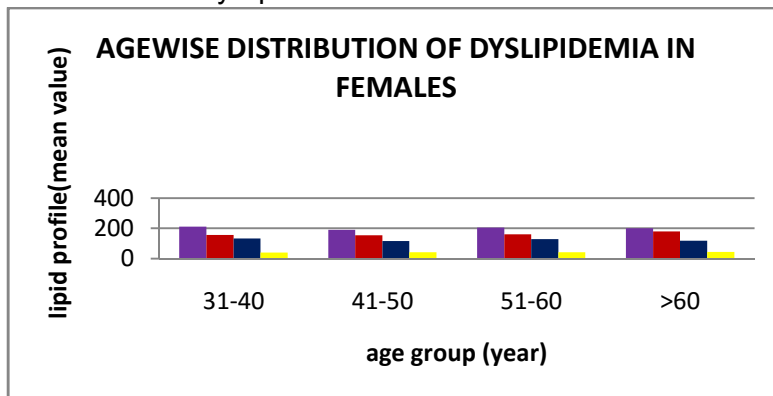


Most common dyslipidemia observed in present study was low HDL cholesterol followed by hypertriglyceridemia and increased LDL cholesterol which is comparable with reference studies. 28 patients (14% of study population) had normal levels of four lipid components which shows that dyslipidemia is significant finding in present study (86% of study population).

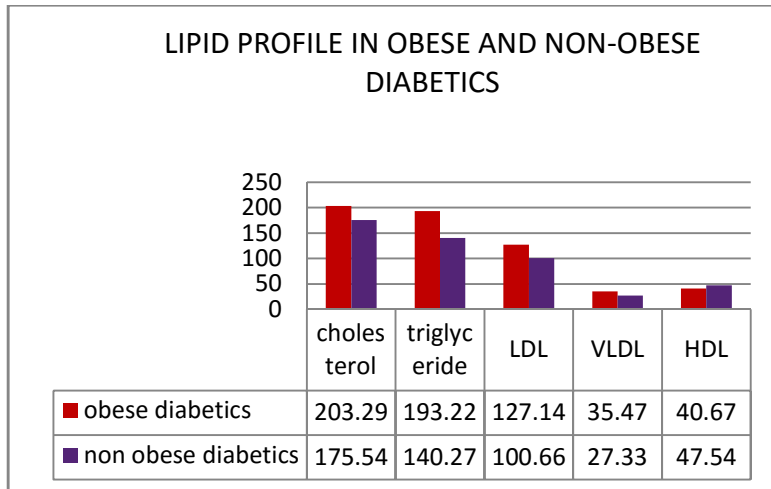
3. Distribution of Dyslipidemia in Males:



4. Distribution of Dyslipidemia in Females:



5. Abnormal lipid profile in Obese & Non-Obese individuals:



**CONCLUSIONS:** The present study attempts to study the abnormality in lipid profile in diabetes mellitus patients. The majority (87%) of patients were in the age group 40-70 years. Mean age of patient was 54 years. The male to female ratio was 1.94:1. Incidence of diabetes in females is lower than males due to various reasons like hormonal make-up, absence of smoking, fat conscious habits and less incidence of insulin resistance in premenopausal women. Incidence of diabetes in females is low in 5th decade. It is equivalent to male in 6th and 7th decade as female hormonal advantage over males is gone in this age group due to menopausal state. BMI  $\geq 25$  was in 66% of patients. Obese diabetics when compared to non-obese diabetics, showed significant increase in the level of serum total cholesterol, serum triglycerides, serum LDL-cholesterol and decreased in the level of serum HDL cholesterol. All lipid component levels except HDL were significantly higher in obese diabetics than non-obese. Thus obesity is a major risk factor for diabetic dyslipidemia. Abnormal lipid profile was the major focus of study. 86% of patients were having abnormal lipid levels.

High total cholesterol was found in 34% of patients.

High triglyceride level was found in 58% of patients.

High LDL cholesterol was found in 57% of patients.

Low HDL cholesterol was found in 80% of patients.

Thus to conclude, dyslipidemia is significant finding in diabetic patients. Realizing the most of the diabetics have a high probability of developing cardiovascular and cerebrovascular disease, it is essential that lipid abnormality in diabetics especially increased triglycerides, low HDL-C and abnormal LDL cholesterol should be properly taken care of, with good glycemic control, lifestyle modification and pharmacotherapy, to decrease morbidity and mortality in diabetes.

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Original article

## **A COMPARATIVE STUDY ON OUTCOME OF MIDLINE LAPAROTOMY WOUND CLOSURE**

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**Key words: OUTCOME ,MIDLINE LAPAROTOMY ,WOUND CLOSURE**

## **ABSTRACT**

**Background** ,Abdominal wound dehiscence is a common complication of emergency laparotomy in Indian setup. Factors as relates to burst abdomen and they recommended certain surgical measures. These measures included control of nausea and vomiting, decompression of distended abdomen, choice of appropriate sutures, control of infection and use abdominal drains. Wound dehiscence is related to the technique of closure of abdomen and the suture used. it is interned to study the closure of abdomen with non-absorbable (Polypropylene, Nylon) versus delayed-absorbable (Polydioxanone)in cases operated at V.S. Hospital , Ahmedabad with respect to the effectiveness of these different suture materials in our setup.

**METHODS AND MATERIALS:**The present clinical Prospective comparative study was carried out at the surgery department of V.S. hospital from June2014 to Jan 2017. Patients underwent both elective and emergency laparotomy through midline vertical incisions. First 50 cases of midline laparotomy closure were studied with these three suture materials; Polydioxanone (PDS), Nylon and Polypropylene (PPL) with/without retention suture. The patients were followed regularly after surgery up to 6 months.

**RESULT:** Wound infection is the most important single factor in the development of burst abdomen and incisional hernia.61The incidence of wound infection was in Polypropylene (Prolene)(12.5%), in Polydioxanone (PDS) (20%) and in Loop Nylon(12.5%) .The incidence of wound infection was related to type of surgery . As in over study infections were higher in emergency surgery then planned surgery, it was 10% in PDS group,12.5% in PPL group and 12.5% in loop nylon group. And in planned surgery only one case had wound infection, which was in nylon group.

**CONCLUSION:** continuous suture technique using no.1 loop Polydioxanone (PDS) had comparatively higher incidence of wound infection, and also report a case of burst abdomen, but had low incidence of scar pain for closure of midline laparotomy incision, No.1 Polypropylene had high incidence of stitch granuloma and Loop nylon no.1 had a low incidence of infection and stitch granuloma but high incidence of scar pain.. Burst abdomen had high incidence in high risk patient irrespective of suture material used, however this incidence can be reduced by prophylactic retention suturing .

**KEY-WORDS:** Abdominal wound dehiscence , Burst abdomen, Incisional hernia, Stitch granuloma.

## **INTRODUCTION:**

Whether inflicted by chance or sustained during a surgical procedure, every wound is simply a disruption of the normal continuity of tissue. When tissue has been disrupted so severely that it cannot heal naturally (without complications or possible disfiguration) it must be held in opposition until the healing process provides the wound with sufficient strength to withstand stress without mechanical support. Although the skill and technique of the surgeon is important, so is the choice of wound closure material<sup>[1,2]</sup>. Every surgeon's dream is to close the abdominal incisions securely, so as to prevent complications, such as wound infection, dehiscence, incisional hernia, suture sinuses<sup>[3]</sup>. Abdominal wound dehiscence is a common complication of emergency laparotomy in Indian setup. Wound dehiscence carries with it a substantial morbidity and mortality in addition to increase in cost of care. Its prevention is important to reduce postoperative morbidity and mortality. This however has not deterred continuing research in attempts to eliminate the problem<sup>[4]</sup>. Factors as relates to burst abdomen and they recommended certain surgical measures. These measures included control of nausea and vomiting, decompression of distended abdomen, choice of appropriate sutures, control of infection and use abdominal drains. In this study surgeon's experience and use of more than two abdominal drains were factors significantly associated with wound dehiscence<sup>[8]</sup>. Many patients have a poor nutritional status and the presentation of patients is often delayed. This makes the problem of wound dehiscence more common and graver. Wound dehiscence is related to the technique of closure of abdomen and the suture used. While the choice may not be so important in elective patients who are nutritionally adequate, do not have any risk factor for dehiscence and are well prepared for surgery, however it may prove crucial in emergency patients who often have multiple risk factors for developing dehiscence and strangulation of sheath is the proverbial last straw in precipitating wound failure<sup>[9]</sup>. Since decades Polypropylene and loop nylon have been widely used for closure of laparotomy wound. Both are a monofilament, non-absorbable suture. Tensile strength of both lasts >1 year<sup>[10]</sup>. A suture material Polydioxanone (PDS) was introduced to reduce the complication rate of laparotomy by its newer properties. Polydioxanone (PDS) is a monofilament, delayed absorbable suture<sup>[5]</sup>. So it is interned to study the closure of abdomen with non-absorbable (Polypropylene, Nylon) versus delayed-absorbable (Polydioxanone) in cases operated at V.S. Hospital, Ahmedabad with respect to the effectiveness of these different suture materials in our setup.

**METHODS AND MATERIALS:** The present clinical Prospective comparative study was carried out at the surgery department of V.S. hospital from June 2014 to Jan 2017. Patients underwent both elective and emergency laparotomy through midline vertical incisions. First 50 cases of midline laparotomy closure were studied with these three suture materials; Polydioxanone (PDS), Nylon and Polypropylene (PPL) with/without retention suture. The patients were followed regularly after surgery up to 6 months. A predesigned proforma was used to collect the information for individual cases. Data was collected, based on post-operative wound complications including post-operative wound infection, wound dehiscence, stitch granuloma, scar pain and incisional hernia.

**Inclusion criteria:**

- Both male and female patients.
- Patients older than 15 years.
- Consent to participate in study.
- Study included both emergency and elective laparotomy.
- Only continuous suture technique was used.
- Only vertical midline abdominal incision closures were included.

**Exclusion criteria:**

- Age < 15 years
- Patients with Pre or Postoperative diagnosis of advance stage malignancy
- Patients who have abdominal skin infection
- Patients who have previous history of laparotomy operation
- patients who have HIV infection

**RESULTS:**A total of 50 patients randomly selected were included from June 2014 to Jan 2017. After midline incisions , closure was performed with PDS loop , Polypropelene and Loop Nylon in 50 cases.. Preference to mass closure was given to all patient . proper skin care was taken and pre-operative and intra-operative antibiotic was given in all laparotomy.

**TABLE – 1 : DISTRIBUTION ACCORDING TO AGE**

AGE IN YEAR	NUMBER OF PATIENTS	CLOSURE WITH PPL	CLOSURE WITH PDS	CLOSURE WITH NYLON
16 – 25	14(28%)	5	4	5
26 – 35	11(22%)	3	3	5
36 – 45	12(24%)	6	1	5
46 – 55	8(16%)	1	2	5
56 – 65	4(8%)	1	0	3
66 – 75	1(2%)	0	0	1
TOTAL	50	16(32%)	10(20%)	24(48%)

PPL= Polypropelene, PDS= Polydioxanone.

The mean age is 32 years and ranges from 16 to 75 years.

Majority of the study participants are in the age group of 16 – 25 years constituting 28 %.

**TABLE – 2 : DISTRIBUTION ACCORDING TO SEX**

SEX	PATIENTS	PERCENTAGE(%)
FEMALE	16	33
MALE	34	67
TOTAL	50	100

In our study, no. of male patients operated for laparotomy were more as compared to no. of females.

Here Male to female ratio is 1.94: 1.



**TABLE 3 : DISTRIBUTION ACCORDING TO NATURE OF OPERATION AND SUTURE MATERIAL**

	EMERGENCY	PLANNED	PERCENTAGE
LOOP PDS (out of 10)	4	6	20%
POLYPROPYLENE (out of 16)	10	6	32%
LOOP NYLON (out of 24)	20	4	48%
TOTAL (50)	34	16	100%

PPL was used in 6 planned & 10 emergency laparotomy. Loop PDS was used in 6 planned & 4 emergency laparotomy. Loop Nylon was used in 4 planned & 20 emergency laparotomies

**TABLE – 4 : INCIDENCE OF COMPLICATIONS**

	PDS LOOP Out of 10	PROLENE Out of 16	LOOP NYLON Out of 24	TOTAL Out of 50	%
WOUND INFECTION	E=2 P=0 20%	E=2 P=0 12.5%	E=2 P=1 12.5%	6	12 %
BURST ABDOMEN	E=1 P=0 10%	E=0 P=0 0%	E=1 P=0 4%	2	4%
STITCH GRANULOMA	E=1 P=0 10%	E=2 P=2 25%	E=2 P=1 12.5%	8	16%
SCAR PAIN	E=0 P=0 0%	E=1 P=1 12.5%	E=3 P=1 16.66%	6	12%

INCISIONAL HERNIA	0	0	0	0	0
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E=emergency operation, P= planned operation

The early and late wound complications encountered in all three suture materials used were as follows

□□Wound infection is the most important single factor in the development of burst abdomen and incisional hernia.<sup>[6]</sup>The incidence of wound infection was in Polypropylene (Prolene)(12.5%), in Polydioxanone (PDS) (20%) and in Loop Nylon(12.5%) .The incidence of wound infection was related to type of surgery.As in over study infections were higher in emergency surgery then planned surgery, it was 10% in PDS group,12.5% in PPL group and 12.5% in loop nylon group. And in planned surgery only one case had wound infection, which was in nylon group.

□□The incidence of stitch granuloma was 1 (10%) in Polydioxanone (PDS loop),4 in Polypropylene (Prolene) sutures (25%) and 3 in loop nylon (12.5%).

□□The incidence of scar pain was 2 in Polypropylene (Prolene) sutures (12.5%) and 4 in loop nylon (16.6%). Incidence of scar pain was more in loop nylon group then polypropylene group, however no pain was observed in PDS group. Pain which occurred, was mild pain(2-3) according to VAS scoring system and relieved by analgesic medicine. Similar study demonstrated a statistically higher incidence of scar pain in the Nylon group.<sup>[6]</sup>

□□There were 2 case of burst abdomen in the present study, which was done on an emergency basis in Polydioxanone (PDS) group and loop nylon group, both patient had high risk for burst abdomen.<sup>63</sup>There was no case reported with burst abdomen in prolene group .one similarly study shows that there was high risk of burst abdomen with PDS group compare to other group.<sup>[6]</sup>

□□Incidence of burst abdomen was 10% in high risk group if prophylactic retention suture not taken. Total 20 high risk patients were operated in them 2 patients had burst abdomen in whom prophylactic retention suture not taken. Retention suture was beneficial in high risk patients for prevention of burst abdomen irrespective of suture material used. Our conclusion that prophylactic retention sutures can decrease the incidence of abdominal wound dehiscence without imposing remarkable postoperative complications.<sup>[5,6]</sup>

□□There was no incidence of incisional hernia in any group till 6 months follow up. The short follow up period (6 months) may be a possible reason for the absence of incisional hernias in this study since > 5% of incisional hernias have been reported to occur after 6–12 months<sup>64</sup>. So this study required more follow up period for any comment on incisional hernia.

**CONCLUSION:**Based on the observations made in this study, it has been concluded that continuous suture technique using no.1 loop Polydioxanone (PDS) had comparatively higher incidence of wound infection, and also report a case of burst abdomen, but had low incidence of scar pain for closure of midline laparotomy incision, No.1 Polypropylene had high incidence of stitch granuloma and Loop nylon no.1 had a low incidence of infection and stitch granuloma but high incidence of scar pain.. Burst abdomen had high incidence in high risk patient irrespective of suture material used, however this incidence can be reduced by prophylactic retention suturing .

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Original article

## **EPIDEMIOLOGY AND PATTERNS OF ISOLATED LIMB INJURIES AT A TERTIARY CARE HOSPITAL IN AHMEDABAD**

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**Key words:EPIDEMIOLOGY ,LIMB INJURIES ,TERTIARY CARE HOSPITAL IN AHMEDABAD****ABSTRACT:**

**INTRODUCTION:** Due to recent advances in technology an increasing number of people suffer from trauma annually which has resulted in change in fracture pattern. As there is a lack of recent systematic trauma registry in India, very little data is available to set up health care facilities.

**AIM:** To determine epidemiology, pattern and initial outcome of patients admitted with isolated limb injury.

**METHOD:** We conducted an observational study on isolated limb injuries without any musculoskeletal disorder at a tertiary care hospital in Ahmedabad from June 2015 to May 2017. The limb injuries were classified as per the Limb Salvage Index score (LSI) for further management.

**RESULTS:**we have included 1300 patients in this study. Mean age was 41.5 years and 68 percent of them were males. Isolated limb injuries showed bi-modal age group with first peak between 21 to 30 years and second at 41 to 50 years. Road traffic accidents were the most common cause of injury followed by fall at home. The most commonly affected bone was femur in lower limb and radius in the upper limb.

**CONCLUSION:** Our study helped in identifying certain features that would be useful for planning preventive strategies, to reduce the numbers of accidents and redirect public investment in health. It also indicates establishment of trauma registry at local, state as well as national level.

**INTRODUCTION:**

Trauma epidemiology is essential to describe the morbidity, disability and dependency as well as defining the most important target for prevention regarding the severity of injury. The prevention of limb injuries is more important necessity for developing nations like India for its economy. It has been previously shown that limb injuries constitute the majority in trauma and road traffic accidents. Generally it involves young and productive persons who are hard core economy of the society, so it is the prime responsibility of the society to prevent such incidents.

Limb injury is the most common injury in younger population and permanent disability affects their quality of life, but Very few studies have been published on it, so we have done our study to evaluate the patients admitted with isolated limb injury.

**Aim:** To evaluate the patients admitted with isolated limb injury for epidemiology, pattern and initial outcome

**Materials and Methods:**

We have included 1300 patients of any age from June 2015 to May 2017 in our observational study.

**Inclusion criteria:**

- 1 The patients having isolated limb injury without any previous musculo-skeletal disorder.
- 2 Isolated limb injuries caused by road traffic accidents, fall from height, fall at home, farm accidents and sports injuries

**Exclusion criteria:**

- 1 Patient with polytrauma or multiple fractures
- 2 Injury other than described above

Data collected in form of age, gender, location and mode of injury, structure involved, operative intervention and initial outcome. Data were collected from case papers and patient or relatives.

**Initial management:** Done according to trauma protocol which varied with the type of trauma encountered.

All patients were immediately assessed and managed for airway, breathing and circulation.

They were given analgesics in form of Inj. Diclofenac sodium or Inj. Tramadol IM/ IV and Inj. Tetanus Toxoid 0.5 Mg IM

Appropriate antibiotics were given as and when required

Once stabilised X-rays of the limb were conducted

**Primary management of fractures:**

Open grade fractures and blood loss were given fast intravenous fluids along with measures to control further blood loss.

Clavicle-Clavicular brace or pouch arm sling

Humerus shaft- shoulder immobilizer or U-slab depending on the area affected.

Reducible distal end radius-Reduced in emergency department and splint was given.

Inter-trochanteric and sub trochanteric femur fractures- primarily by ankle skin traction

Shaft femur- Monitored vitally for shock management due to frequent severe blood loss in such injury. Fluids and blood were started almost immediately by two wide bore IV cannula.

Bohler splint with ankle traction were given before taking X-rays.

Patients in severe shock having complications like fat embolism requiring long term medical care, were managed with upper tibial Steinmanpin traction with one brick and bohler elevation.

Displaced patellar fracture-Aspiration of blood from the knee, RJ bandage with AK-BK (Above Knee and Below Knee) slab and elevation provided.

Closed shaft tibial fractures- AK (Above Knee) slabs Bohler elevation.

Patients, in which operative intervention was not possible immediately, were managed with Calcaneal Steinman pin traction.

Carpal, metacarpal, tarsal,metatarsal and phalangeal fractures- Below elbow(BE) or below knee (BK) slabs with toe rest.

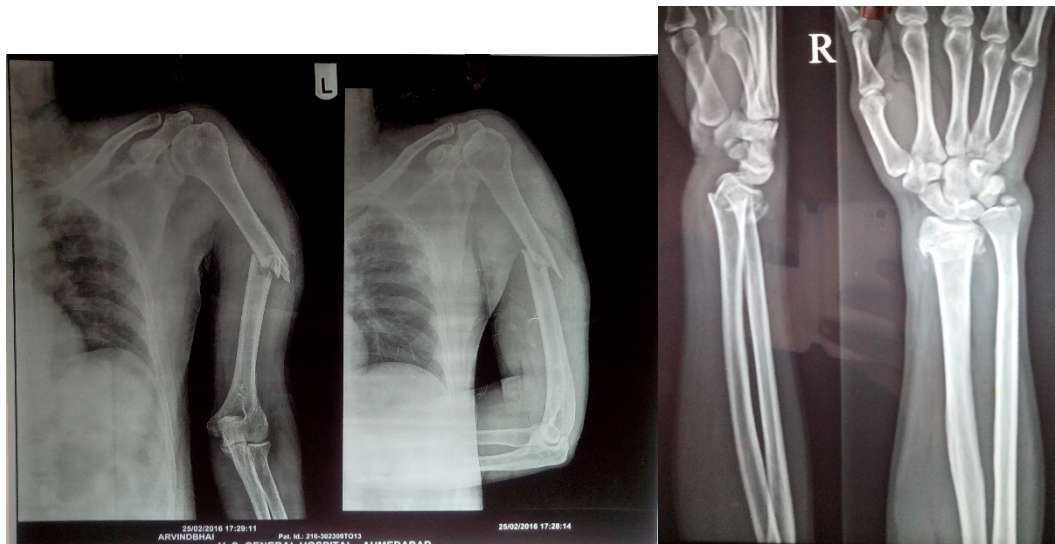


Fig-1 Fracture shaft humerus Fig- 2 Fracture of distal radius

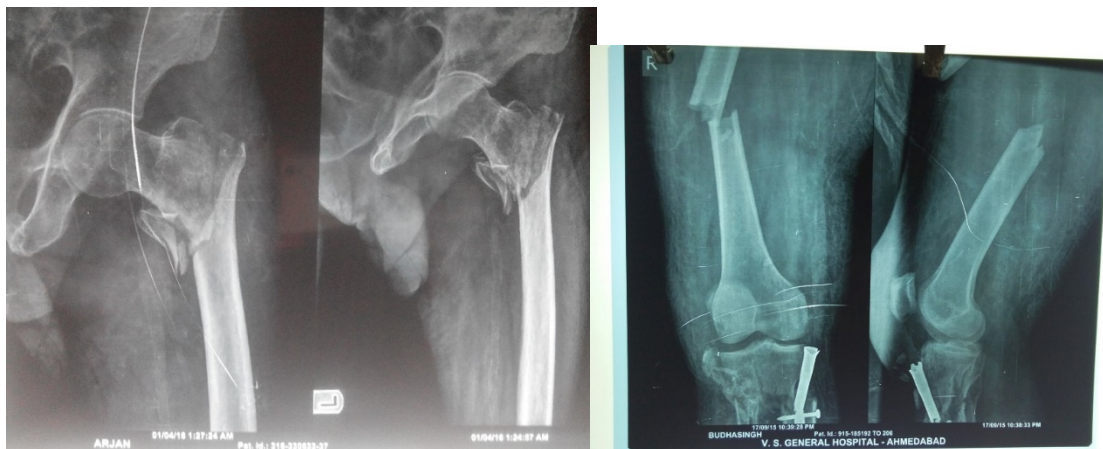


Fig- 3Fracture inter-trochanteric femur Fig- 4Fracture shaft femur



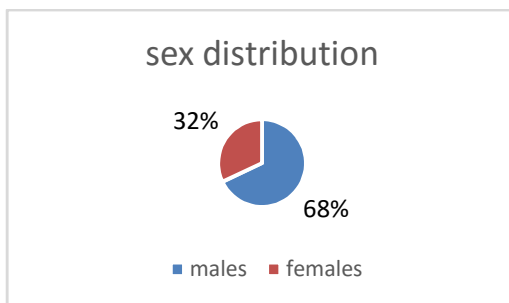
Fig-5 fracture shaft tibia



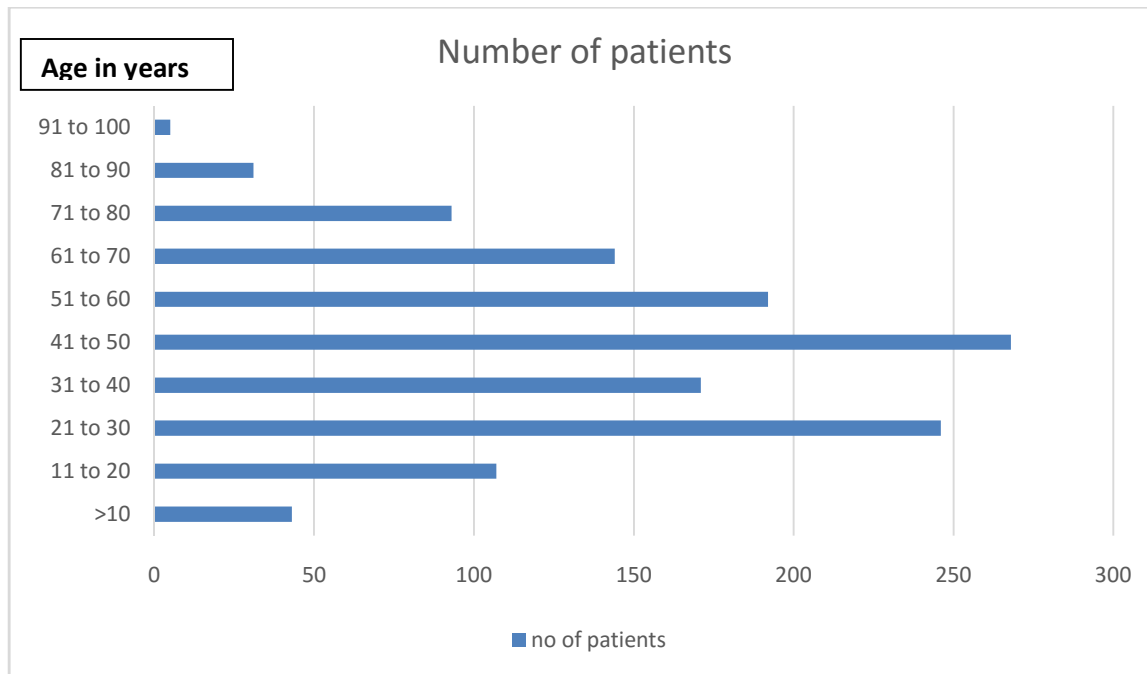
Fig-6 fracture shaft radius ulna

### Results:

Data were collected between June 2015 and May 2017, for 1300 patients, who were victims of isolated limb injuries due to trauma. The mean age of patients was 41.5 years (minimum 5 years and maximum 95 years) with majority being males.



In this study, 68% i.e 884 out of 1300 patients were male and 32% i.e 416 patients were female.



There was bimodal peak, one at 21-30 years of age and the other at 41-50 years of age. Fractures of shaft of long bones like isolated ulna and shaft femur were seen commonly in younger age group while fracture of inter-trochanteric femur, distal radius and femur neck were seen commonly in elderly patients.

#### Mode of injury:

**Table-1 Mode of injury**

Mode of injury	% of population
Road traffic accident	42
Fall at home	23
Beaten by opposite party	18
Fall from height	10
Sports injuries	04
Farm accidents	03
<b>Total</b>	<b>100</b>

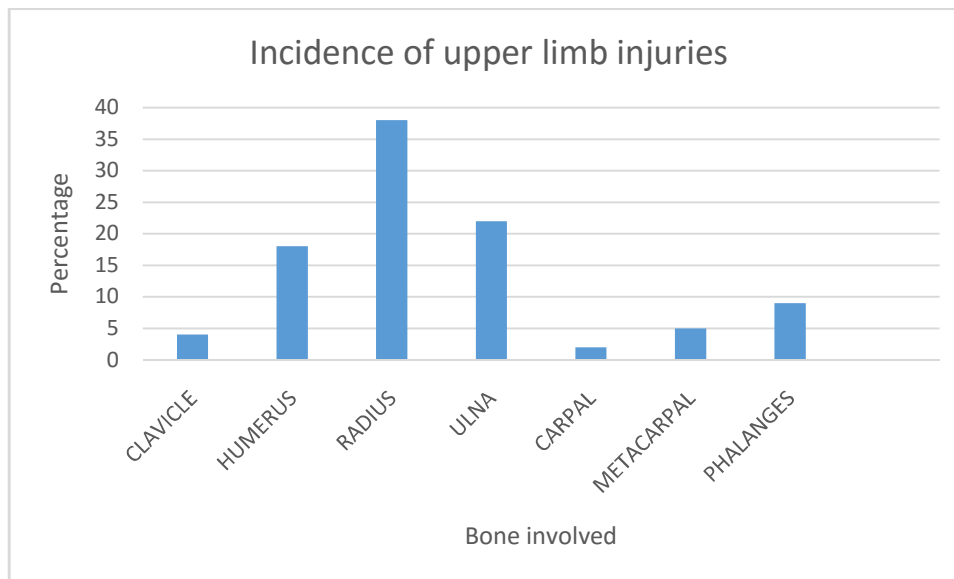
As shown in Table-1 road traffic accident is the most common mode of isolated limb injury followed by beaten by opposite party and fall down at home.



**Table-2 Structure involved in upper limb**

Structure involved	%
Clavicle	05
Humerus	18
Radius	38
Ulna	22
Carpal	02
Metacarpal	06
Phalanges	09
<b>Total</b>	<b>100</b>

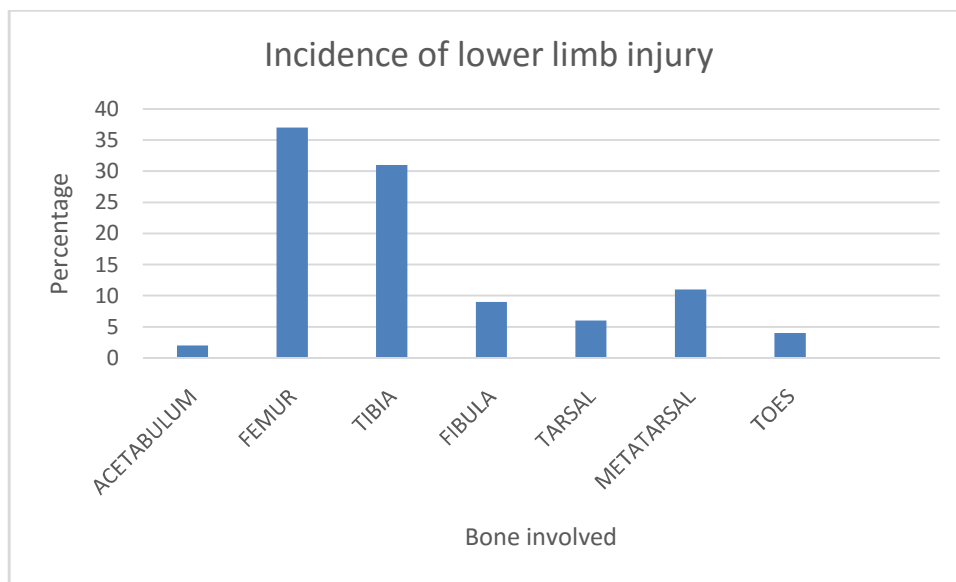
Radius was the most common bone involved followed by ulna.

**Table-3 Structures involved in lower limb**

Structure involved	%
Acetabulum	02
Femur	37
Tibia	31

Fibula	09
Tarsal	06
Metatarsal	11
Toes	04
<b>Total</b>	<b>100</b>

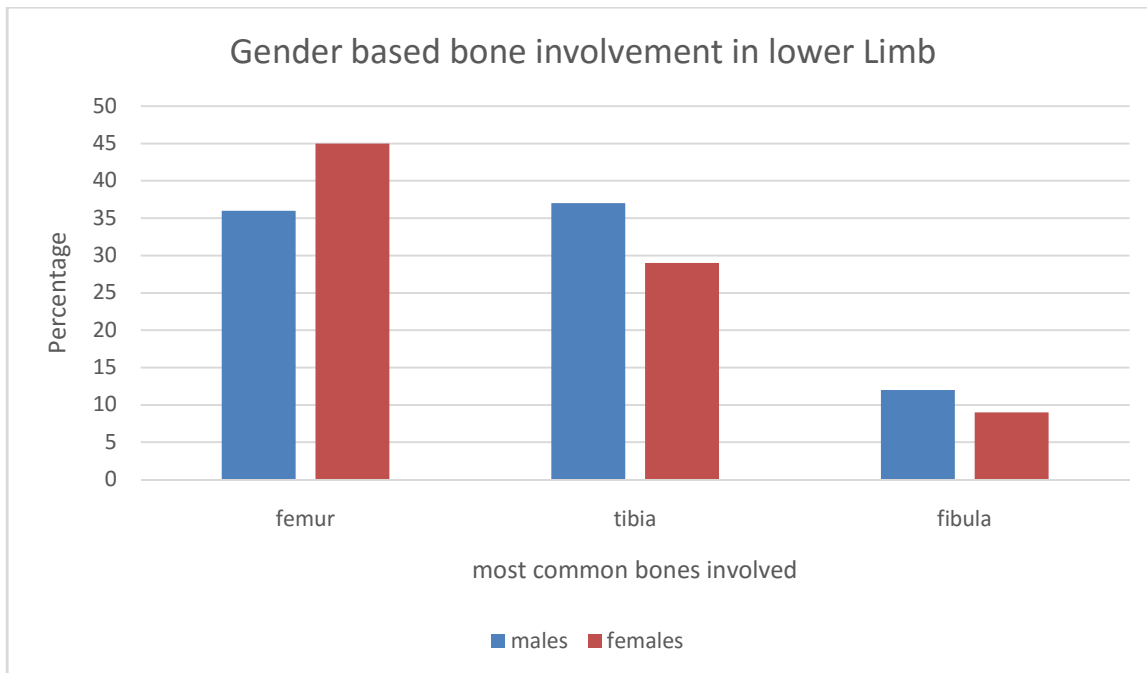
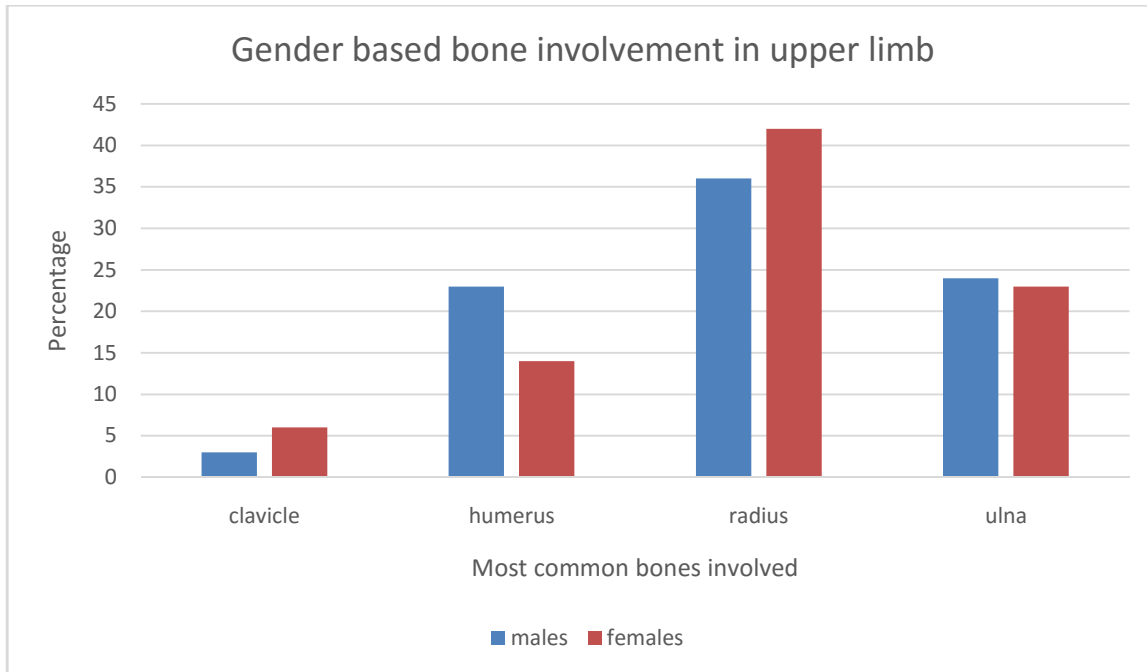
Femur was the most common injured bone (37%) followed by tibia (31%) in lower limb injuries.



#### **Gender based bone involvement:**

In upper limb, radius was the most commonly involved bone in male and female both, but involvement rate of radius was higher in female as compared to male.

In female, femur was the most common involved bone in lower limb, which is higher than male. In male the most common involved bone in lower limb was the tibia followed by femur.



**Discussion:**

India is a developing nation and Gujarat is one of the fastest developing state in India. With the advent of new scientific advances, architectural designs and modes of transportation, there has been a significant change in the trauma pattern. Recently WHO reported that, by 2020 traumatic injuries will be the third largest killer in developing countries.

Throughout the world, about 3000 people die every day and 30,000 are injured seriously in accidents.

Ahmedabad is a metro city where many young population come for earning purpose. They all are having great transportation and fast life with due stress to meet all demands. It has few tertiary care public hospitals where patients are brought in emergency by the 108 ambulance services. Our hospital is one of them, with dedicated trauma centre. As it is in the centre of the city, easily approachable to nearby places and treatment is provided free of cost in almost all patients majority of the patients with trauma are admitted here. Mostly the patients brought here are from a radius of around 120 Kilometres, but because of its popularity, patients from remote areas also received quiet frequently in the emergency department.

According to a study carried out in Royal Infirmary of Edinburgh between 2010 and 2011, males have greater incidence of fractures of metacarpals, finger phalanges and ankles while females have higher incidence of fractures of distal radius and proximal femur. This co-relates well with the findings of this study which shows higher incidence of metacarpal and ulna fractures in males while distal radius and femur fractures are higher in females. This shows that post-menopausal women are particularly susceptible to fragility fractures in regions of distal radius and proximal femur.

The injury patterns are continuously evolving due to the changing life style. In this study, 42% of the fracture were due to road traffic accidents and 23% due to fall down at home. In the study carried out in Edinburgh the fractures due to road traffic accidents were less than 10%. This shows that in a developing nation like India there is an increased load of fractures due to rash driving particularly in younger population.

**Conclusion**

According to the mapping of the profile of individuals involving limb injury at the emergency department of our hospital, it was possible to identify some characteristics that may be useful for planning prevention strategies such as the development of protection mechanisms for lower limbs, stimulating the enforcement regarding the compliance of traffic laws by drivers, use of Zebra crossing for crossing roads, speed limit and awareness of safety measures to reduce the numbers of accidents and redirect public investment in health.

In the current era of advanced technology; it is not difficult to set up trauma registry. Such an initiative should be taken by the government to appropriately manage trauma victims. This will further reduce load on economy by avoiding morbidity and dependency.

So our study will provide insight to lots of epidemiologist, emergency physicians, orthopaedic surgeons and further aid for its preventive measures.

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## **COMPARATIVE EVALUATION OF EFFICACY OF EMLA CREAM AND A PLACEBO (MOISTURIZING CREAM) IN PRODUCING DERMAL ANALGESIA FOR VENOUS CANNULATION.**

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**Key words:**EMLA CREAM ,DERMAL ANALGESIA ,VENOUS CANNULATION

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### **ABSTRACT**

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**BACKGROUND:** Venous cannulation is the most commonly performed invasive procedure in hospital patients. It is painful and associated with a high incidence of vasovagal reactions and haemodynamic stress response in patients.

**OBJECTIVES:** This study aims at evaluating the efficacy of EMLA cream in producing dermal analgesia for venous cannulations & effect of it on hemodynamic stress response.

**MATERIALS AND METHODS:** 100 patients of age group 12 to 18 of ASA grade I /II were selected. Patients were randomly divided into two groups (N=50). In Group A EMLA cream and in Group B Moisturizing cream was applied 60 minutes before venous cannulations. Pain was assessed with the help of 4-point scale. Pain and hemodynamic stress response( blood pressure and heart rate) was noted before and after venous cannulations. Local and systemic side effects were also noted.

**RESULTS :** Group A patients (EMLA cream ) had lower pain scores and decreased hemodynamic stress response to venous Cannulations when compared to group B (placebo-moisturing cream). Local side effects -redness was noted in only 1 patient in group A. (EMLA cream)

**CONCLUSION:** The application of EMLA cream for venous cannulation alleviated pain and also prevented hemodynamic stress response. The main advantage being in its single dosage and easy application. EMLA cream is effective in producing dermal analgesia with less hemodynamic stress response to venous cannulation.

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**KEY WORDS:** EMLA cream, Venous Cannulation, 4-point scale.

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### **INTRODUCTION:-**

One of the most important pre-requisites of delivering anaesthesia to any patient is securing a safe and patent intravenous access for drug and fluid administration<sup>1</sup>. Venous cannulation is the most commonly performed invasive procedure in hospital patients<sup>2</sup>. It is painful and associated with a high incidence of vasovagal reactions and hemodynamic stress response in patients<sup>3</sup>. Further, the needle prick can also make a patient uncooperative.

From quick immunizations or glucose monitoring to venipuncture, laceration repair, dermatologic procedures, and even tattooing (and removal!), needle pain is a growing concern. The effects of untreated pain impact medical outcomes and are remembered by preverbal children.

Various strategies have been investigated to alleviate pain associated with venous cannulation including ethyl chloride spray, intradermal or subcutaneous injection of local anesthetic and distraction techniques<sup>4</sup>. With the advent of Eutectic Mixture of Local Anaesthetics (EMLA) cream, effective topical analgesia of intact skin is now claimed to be feasible without the need for subcutaneous injections or exposure to high concentrations of local anaesthetics<sup>5</sup>.

EMLA cream is 1:1% oil in water emulsion of 2.5% lignocaine and 2.5% prilocaine bases. This mixture is termed eutectic, as it has a melting point lower than its individual components. This mixture is liquid at room temperature, while individual components are crystalline substances<sup>6</sup>.

Therefore study was done to evaluate the effectiveness of topical Emla cream in obtunding the pain and hemodynamic stress response produced by intravenous cannulation.

### **AIMS AND OBJECTIVES:-**

This study is done to evaluate the efficacy of EMLA cream in producing dermal analgesia for venous cannulation.

The objectives are

- 1) Pain
- 2) Hemodynamic stress response

### **MATERIALS AND METHODS:-**

This clinical study was done in 100 patients of age group 12 to 18 of ASA grade I /II posted for elective surgeries. A routine pre-operative evaluation was done in all patients and investigations required for respective surgeries were reviewed. The purpose and procedure of the study was explained and informed consent was taken.

Exclusion criteria:

- 1) Hypersensitivity to EMLA cream \local anesthetics.
- 2) Patients with methemoglobinemia or on drugs that may cause methemoglobinemia.
- 3) Psychiatric illness.
- 4) Local infection.

The Patients were randomly divided into two Groups A & B (N=50). After explaining the procedure a suitable vein on the dorsum of the hand was selected and study drugs were applied before 60 minutes of intravenous cannulation. In group A, EMLA cream 1.5 to 2 gm/10 cm<sup>2</sup> area was applied in a thick layer as shown in figure 2. In group B patients, moisturizing cream was applied in similar method. This layer was then covered with an occlusive dressing.

After 60 minutes, the occlusive dressing was removed. The area was then wiped dry with gauze and observed for signs of any local reaction. After disinfecting with spirit, I.V cannulation was performed and pain noted by 4-point scale<sup>7</sup> and graded as 0-No pain ,1- Mild facial grimace ,2- Verbal response ,3- Withdrawal of hand. Hemodynamic response-Heart rate and blood pressure were also recorded before and after cannulation.

**STATISTICAL ANALYSIS:-**

The results were presented as mean, standard deviation, numbers and percentages. Inferential analysis was performed using chi-square test. A two tailed p-value <0.05 was considered as statistically significant.



FIGURE 1 EMLA CREAM APPLIED



FIGURE 2:- EMLA CREAM

**RESULTS AND OBSERVATIONS:-**

The Study groups were compared with respect to Demographic parameters, pain scoring and hemodynamic variables. The Demographic parameters were comparable in both the groups as shown in Table-1.

Table 1 :- Demographic parameters

PARAMETERS	GROUP A	GROUP B
AGE(years)	15.38±2.32	14.66±1.93
ASA/II	28/22	26/24
SEX(M/F)	30/20	29/21

Table 2:- Pain response to cannulation (4 point scale)

Groups	Pain score (no of patients)				Mean	Std. deviation	'p'
	0	1	2	3			
Group A	31	15	4	0	0.46	0.61	0.0001
Group B	0	12	8	30	2.36	0.85	

Pain response to intravenous cannulation was noted as shown in Table-2. Score comparison among the study groups showed a lower pain scores in the EMLA group which was statistically highly significant(p=0.0001). In group A(EMLA ) 62% of patients had no pain, 30% patient had

mild grimace , 8% of patient told verbally that they had pain and no patient had withdrawal of hand while in control group all patients had pain out of which 24% had mild grimace, 16% verbally responded and 60 % had withdrawn their hand.

Table 3:- Comparison of heart rate variation

Annulations	Group	Min.	Max.	Mean	Std. deviation	'p'
Before	A	80	120	95.74	11..44	0.0644
	B	84	126	100.24	12.59	
After	A	84	122	85.49	11.24	<0.0001
	B	90	132	110.7	11.08	

Patients in the control group had a higher increase in heart rate when compared to group A which was statistically highly significant( $P=<0.005$ ).

Table 4:- : comparison of systolic blood pressure variation

Annulations	Group	Min.	Max.	Mean	Std. deviation	'p'
Before	Group A	100	140	120.76	28.28	0.6483
	Group B	110	154	123.48	31.11	
After	Group A	107	126	116.96	13.43	0.0027
	Group B	128	160	128.4	22.62	

Patients in the control group had a significant rise in systolic blood pressure after cannulation which was statistically highly significant( $p=<0.005$ )

Table 5: Comparison of diastolic blood pressure variation.

Annulations	Group	Min.	Max.	Mean	Std. deviation	'p'
Before	Group A	70	80	75.16	7.07	0.0220
	Group B	60	90	82.52	21.21	
After	Group A	70	78	75.08	5.65	0.0001
	Group B	70	94	86.54	16.97	

Patients in the control group had a significant rise in diastolic blood pressure after cannulation which was statistically highly significant( $p=<0.005$ )

Table 6:-Side effects.

SIDE EFFECTS		GROUP A(NO OF PATIENTS)	GROUP B (NO OF PATIENTS)
LOCAL	REDNESS	1	0
	ITCHING	0	0
SYSTEMIC		0	0

Only 1 Patient in group A had redness at local site of application. No serious adverse reactions were seen in any of the patients.

## **DISCUSSION:**

Pain is a complex matrix of biological, psychological and sociological phenomena; it is a vital function of the nervous system that provides information and helps avoid danger to the human body. The nociceptive apparatus associated with skin can often produce fear of medical procedures, causing discomfort, pain and anxiety, which sometimes lead to vasovagal attacks<sup>8</sup>. Venous cannulation is the most commonly performed invasive procedure in hospital patients<sup>2</sup>. It is painful and associated with a high incidence of vasovagal reactions and pressor responses in patients<sup>3</sup>.

Many attempts have been made previously to provide analgesia to the skin. Monash S have suggested preparations containing lignocaine for topical anaesthesia of the unbroken skin<sup>9</sup>. Kligman and Brechner, Cohen and Pretsky suggested topical application of local anesthetic mixtures with dimethyl sulphoxide (DMSO)<sup>10,11</sup>. However, no formulation has gained wide acceptance mainly as a result of inadequate relief of pain, local irritation or toxic reactions. Hopkins CS and Buckley CJ conducted a study in children treated with EMLA cream prior to venous cannulation and lower pain scores were recorded in them<sup>12</sup>. Heart rate, systolic blood pressure and diastolic blood pressure were recorded before and after cannulation in all our patients. In one another study done by Lindh et al the same finding was appreciated that EMLA cream application decreased the stress response to venepuncture in new-born infants<sup>13</sup>.

Our study was done in 100 patients of either sex belonging to the age group 12-18 years posted for elective surgeries. In group-A patients, EMLA cream and in group-B patients, a placebo (moisturizing cream) was applied 60 minutes before intravenous cannulation. Pain score was assessed in these patients for IV cannulation by the 4-point scale. The mean pain score obtained in group A was 0.46; compared to control group of 2.36. This showed that EMLA cream application is probably effective after applying for an hour for analgesic effect. In Group A ( EMLA cream ), 92% patients had lower pain scores of 0 and 1; whereas only 24% patients in the control group had low pain scores. The results were comparable to the study done by Wig J, Johl KS who has revealed reduced pain scores in 94% of their subjects with EMLA cream prior to cannulation compared to 24% of the placebo group<sup>14</sup>. Lower pain score was noted in EMLA group which was statistically highly significant.

EMLA group patients did not have a significant rise in hemodynamic variables after cannulation when compared to the control group which was statistically highly significant. Only one patient had redness at the site of EMLA cream application. There were no other side effects in any group.

## **CONCLUSION**

The efficacy of a topical anesthetic formulation EMLA 5% cream ( Eutectic mixture of local anaesthetics ) in obtunding the pain and hemodynamic response produced by intravenous cannulation was determined in our study. The main advantage of EMLA cream is in its single dosage and easy application without distorting anatomical landmarks. The only disadvantage is cost of EMLA cream.

Our study results revealed that application of EMLA cream for venous cannulation alleviated pain and also prevented a significant rise in heart rate and blood pressure.

To conclude with, application of EMLA cream prior to venous cannulation is advantageous in all patients. The cost factor could be overlooked considering the efficacy of EMLA cream in producing dermal analgesia especially in children, anxious adults and in patients exposed to repeated venous cannulation to reduce hemodynamic stress response

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Original article

**COMPARISON OF ASLEEP AWAKE ASLEEP (AAA) TECHNIQUE/ MONITORED ANAESTHESIA CARE (MAC) TECHNIQUE FOR AWAKE CRANIOTOMY.**

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**ABSTRACT**

**BACKGROUND:** Awake craniotomy is an important technique used for Braintumor excision from eloquentcortex,Epilepsyfoci removalsurgery,Deepbrain stimulation,Lesscommonly formycoticaneurysms,A-Vmalformation near cortical areas. **AIMS AND OBJECTIVES**

Maintaining patients cooperationby provision of optimalanalgesia,sedation,anxiolysis and comfortable position ,Achieving homeostasis with safe airway, adequate ventilationand hemodynamic stability.,Ensure minimal interference with electrocorticographicrecording during mapping. To show the feasibility of dexmedetomidine and scalp blockwith 0.5% bupivacaine for cortical mapping.

**Material methods** in both group Dexmedetomidine infusion &scalp block given

In group A: lgel2nd generation LMA for airway managementafter inj propofol 2 mg/kg

In group B: Nasopharyngeal airway for same

**Observations:** group A better airway management & less complications

**Conclusion:** AAA method is superior then MAC method.

**INTRODUCTION**

Awake craniotomy is popular since 2 decades.It is usuallyperform for epilepsy surgery,temporal lobectomy, which encroaches eloquent cortex,motor ,speech areas,Deep brain stimulation,for AV malformation which needs intraoperative functional testing, Cortical mapping, which requires patient to be awake.Main advantage of awake surgery is to define limits of resection & avoid Postoperative neurological deficits.

**MATERIALANDMETHODS:**

- 30 adult patients with mass near the eloquent area with ASA grade I & II, Age group 18 to 60 years were selected for awakecraniotomy.patients were informed in detail about procedure.Proper counselling of each patient done.Afterng inform consent Scalp block was given with 0.25%bupivacaineblocks supraorbital,supratrochlear,

zygomaticotemporal, Auriculotemporal, greater & lesser occipital, greater auricular nerves for better analgesia.

### **PREMEDICATION**

- INJ. Glycopyrrolate 0.04 mg/kg, INJ. Ondansetron 0.08 mg/kg,
- INJ. Fentanyl 1 mcg/kg were given Intravenously.
- Benzodiazepine premedication was avoided because of its residual sedative and amnesic effects during intra operative assessment phase.
- O<sub>2</sub> mask was applied with O<sub>2</sub> flow 4L/MIN. Urinary catheter was inserted for patients comfort for long operative procedure and for diuretic administration. INJ. Cefazolin 1 gm was given for infection prophylaxis.
- After premedication, INJ. Dexmedetomidine 1 mcg/kg (Loading dose) Intravenously given over 10 minutes. At the same time scalp block was given by using Bupivacaine 0.25% max. 30 ml

In GROUP A: patients were managed by ASLEEP AWAKE ASLEEP technique in following manner.

Before induction patients were pre oxygenated with 100% O<sub>2</sub> for 3 minutes.

- patients were induced by INJ. PROPOFOL 2.5 mg/kg intravenous dose. After induction, 2nd generation LMA (Igel) no. 3 for female patients and no. 4 for male patients was inserted, cuff inflated, bilateral air entry checked and after confirming air entry Igel was fixed patients were put on spontaneous plus assistance mode on ventilator. Of Dragger Fabius GS work station
- With Igel Etco<sub>2</sub> sample line was attached to monitor Etco<sub>2</sub> intra operatively.

### **Patients were maintained by**

- By Igel O<sub>2</sub> (2l/min) + N<sub>2</sub>O (2l/min) + Sevoflurane (0.5-2%) was started.
- Dexmedetomidine infusion was started at the rate of 0.5 mcg/kg/hr.

In GROUP B patients were managed with Monitored Anaesthesia care (MAC) technique by following manner

Dexmedetomidine loading dose of 1 mcg/kg followed by infusion of 0.5 mcg/kg/hour Nasopharyngeal airway inserted and oxygen was attached to it with flow of 3-4 liters/min, Etco<sub>2</sub> sample line attached.

### **POSITION:**

- Patients were positioned in RIGHT OR LEFT LATERAL position according to site of lesion.



- SNIFFING position was achieved to help facilitate and patent airway.
- Attention was made under the drape to allow direct communication with patients.

#### **INTRA OPERATIVE PERIOD:**

- After position, operation was started and surgeons were told to inform 15 min before the craniotomy was expected to over.
  - All inhalational agents were stopped in group A, l-gel was removed and dexmedetomidine infusion was reduced to 0.3 mcg/kg/hr, in both groups.
  - Within 15 to 25 minutes after stopping inhalation agent patients were awake, conscious, and comfortable.
  - Patients were put on nasal prongs with O<sub>2</sub> flow 3l/min.
- preoperative awareness was assessed by PRST score. BIS was only available for 5 patients of AAA & 5 patients of MAC technique. It was managed between 60-70
- After patients were fully awakened,
- When neuro surgeon performed speech testing and cortical mapping patients remained alert and oriented throughout the awake portion without speech impairment. Patients were watched for convulsion, respiratory depression and vitals.
- Dexmedetomidine infusion was increased to 0.5 mcg/kg/hr after the resection of tumour. Remaining surgery was conducted with same rate. At the time of skin closure, Dexmedetomidine infusion was stopped and patients were awakened, oriented, following verbal commands before dressing.
  - After monitoring for 30 minutes patients were shifted to postoperative ward.
  - Postoperative course of patients was noticed in form of vitals, complications, mean hospital stay
  - At least patient satisfaction score & surgeon satisfaction score noticed.

#### **RESULTS**

- Patients Etco<sub>2</sub> remain within limit ranging from 26 to 32 mm of Hg during entire operation in group A. In group B ETCO<sub>2</sub> was slightly elevated. 4 patients of B group developed shortness of breath, anxiety they were converted into full general anaesthesia due to hypercapnia 46.7 mm of Hg (mean) and desaturation of 91%
- In group A all patients maintain Etco<sub>2</sub> 32.7 (mean) mm of Hg
- There was not a single episode of hypercarbia and respiratory depression, or desaturation in any of patients during entire operation in group A.

Intraoperative seizures were present in 4 patients (3%) in group A, 7 patients (5%) in group B which was present during mapping due to touching of functional areas of cortex., stopped by cold saline irrigation

Nausea and Bradycardia was present Perioperatively in 2 patients in each group which was due to deep cortical resection near midline treated accordingly. by coordinating with surgeon to reduce traction, administration of anticholinergic more effective than antiemetic.()

10 patients in group B (7.4%) have tight brain which was relieved by increasing Dexmedetomidine infusion rate, and furosemide

Postoperative vitals were normal in both groups & no complications noted ( $P > 0.05$ )

Mean hospital stay was more 3.98 days in group B, whereas 3.80 days in group A.

Patients satisfaction score was good with AAA & satisfactory with MAC.

Surgeon satisfaction score was excellent with AAA & good with MAC.

## DISCUSSION

### Management of anaesthesia for awake craniotomy varied as evolution in various anaesthetic drugs, technique, as well as gazzates available for Anaesthesia

- Awake craniotomy poses unique challenges especially for the anaesthetist who is faced with an unprotected airway and limited access to the patient due to positioning and pinning of the head.(1)
- So, appropriate patient selection, counseling is important for this method.(2)
- Patient require sedation or general anaesthesia until the brain is exposed and again at the end of surgery while the cranium is closed.

In present study we have compared Two well-known techniques .Both groups patients premedicated in same manner. We have used Dexmedetomidine in both groups as it provides sedation without cognitive impairments (8)

scalp block was given with 0.25% bupivacaine (max.30ml) to decrease pain.(9) intraoperative sedation was assessed by Ramsey sedation score ( RSS ) was managed around 3 before mapping, and 2 after mapping. sedation should be titrated as under sedation cause anxiety , hypertension, tight Brain & oversedation causes desaturation, problem of correspondence during mapping..(11,13)

In group A airway was managed by second generation LMA (Igel) as it can be removed with minimum access & without causing Laryngeal irritability.(7)

Scalp block provide Perioperative & post operative analgesia. no patient have emergence hypertension as we have not intubate any patient(2,10)

Complications observed in our study were comparable with study of Esononu CL,(12) in terms of complications, haemodynamics stability, hospital stay(12)

Mean hospital stay was less in group A.,but was statistically insignificant.scientists are inventing method for outdoor awake craniotomy (10)

Patients satisfaction score & Surgeon satisfaction score was more in favour of AAA technique than MAC.

#### LIMITATIONS::

Limitations of our study were we have done study in limited number of cases.large scale study required.

Study design for day care surgery or earlyambulation surgery for uneventful tumor resection should be done.

BIS monitoring for depth of Anaesthesia is more useful than RSS, which was available for only 5 patientsof each group.

#### CONCLUSION

- Dexmedetomidine is noble,neweranaesthetic agent used inneuroAnaesthesia
- Awake craniotomy wasmore effectively conducted by AAA than MACin terms of better airway management.& Less incidence of complications,less hospital stay.

.In Nutshell AAA technique is more effective than MAC technique for awake craniotomy.

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- 12.comparision of MAC orAAA technique Esononu CL,,Punita Tripathi worldNeurosurgery,2017

12

Original articles

### **Liposuction vs Surgical excision of Gynecomastia**

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**Key words: Liposuction, Surgical excision, Gynecomastia, comparative study**

### **ABSTRACT**

**Background:**Gynaecomastia is usually treated with liposuction or liposuction with excision of the glandular tissue. The type of surgery chosen depends on the grade of the condition.

**Objective:** In this study, we aim to discuss the outcomes of the surgical management of the gynaecomastia and assess the morbidity and complication rates associated with the procedure to determine whether certain surgical techniques produce better outcomes.

**Materials and Methods:** The technique complies with all recommended protocols for different grades of gynaecomastia. It uses liposuction, gland excision, or both, leaving only minimal post-operative scars.

**Conclusion:** The study has found that moderate sized gynaecomastia whether true or pseudo gynaecomastia with mild to moderate breast redundancy can be managed easily and effectively by liposuction alone or combined with glandular resection while the conventional infraareolar subcutaneous mastectomy still gives satisfactory results and with no need to remove extra skin. On the other hand, large gynaecomastia with severe breast redundancy can be treated effectively by the inferior pedicle technique without vertical scar.

**Keywords:** liposuction; gynaecomastia surgery; gynaecomastia

## INTRODUCTION

Gynecomastia is a common problem in the male population, particularly in young adults, with a reported prevalence of up to 36%. (Nuttal FQ., 1979). The term refers to a benign female-like enlargement of the male breast resulting from an increase in ductal tissue, stroma and/or fat. Enlarged breasts can cause anxiety, self-consciousness and embarrassment, functional problems and psychosocial discomfort and fear of malignancy. It is not surprising, therefore, that gynaecomastia is the most common cause for seeking medical advice for a breast condition in men. The two treatment options are medical therapy and surgical removal. Medical therapy is probably most effective during the active proliferative phase of the condition. If a trial of medical treatment is unsuccessful or the gynaecomastia has been present for several years, then surgical treatment is likely to be required. Surgical options for gynaecomastia include liposuction, open resection and resection with skin reduction. Outcome studies of surgical correction have generally shown high levels of satisfaction. (Wiesman IM, et al., 2004). Surgery is, therefore, not a decision to be taken without careful patient assessment. Various techniques have been described over the years, but no technique has yet gained universal acceptance. Liposuction with or without gland excision is the commonly used technique among plastic surgeons. (Boljanovic S, et al., 2003). The procedure chosen is determined by the grade of the condition. (Wiesman IM, et al., 2004) Conventionally, liposuction in gynaecomastia is performed using one or two small incisions on each side of the chest (Lanitis S, et al., 2008). The gland is excised through a periareolar incision. (Anderson RC, et al., 2006). This is followed by the insertion of drains either through one of the liposuction entry wounds or through a separate incision. The drain site and liposuction wounds are not sutured and are left to heal secondarily, leading to visible scars [8] in the chest in addition to the periareolar wounds. But, when the liposuction is performed through incisions in the periareolar region, the fat below the areola cannot be addressed satisfactorily, which may necessitate the use of larger incisions to deliver the gland. We aimed to review all gynaecomastia patients

operated on under the care of AMCMET medical college and Hospital within 1 years . We aimed to assess the morbidity and complication rates associated with the procedure and to determine whether certain surgical techniques produced better outcomes.

## MATERIALS AND METHODS

### Technique

The markings are performed in an upright posture and general anaesthesia is administered. The patient is positioned supine on the table. The breast is infiltrated with 200-250 ml of tumescent fluid (1 L Ringer lactate with 20 ml of 2% lignocaine, 20ml sodium bicarbonate, 1 ml of 1:1000 adrenaline). The initial incision for liposuction is a 7-mm stab made at the 6'o clock position at the skin-areola junction of the nipple-areola complex. Pre-tunneling before liposuction is carried out using a liposuction cannula through this incision. A 3 mm-diameter liposuction cannula with the Mercedes Benz tip is inserted and liposuction of the ipsilateral breast is completed. The same procedure is repeated on the opposite breast as well. All liposuctions were carried out using a power-assisted device. At the end of this step of liposuction, the sub-areolar part of both the breasts remains unaddressed. A 4-mm-diameter liposuction cannula is inserted through the same incisions and liposuction of the sub-areolar regions of the opposite breasts is also performed after creating one tunnel across the chest. Then, through another tunnel, the inframammary area is again sucked. The liposuction is done in such a way that there is a 5-mm-thick layer of fat that is left underneath the skin at all the regions. The volume of fat aspirated from each side is noted. In patients requiring a glandular excision, the stab incision is extended for 2 mm on either side into a periareolar incision and the glandular elements are removed surgically. Post-operatively, a suction drain is inserted and brought out through the same incision. A mattress suture is placed and left loose in the part of the incision through which the drain is passed, to be tied later after removal of the drain. This was followed by pressure vest from the immediate post-operative period, the dressings were changed on the first or second post-operative day and the drains were removed when the drain volume was <30ml. The patients were discharged on the same day of the procedure. This was followed by regular clinical follow-up at 3 months to 6 month.

The study was conducted at AMCMET medical college and Hospital during the period from January 2017 to February 2018. The total number of subjects enrolled in the study was 30 patient. All the patients underwent clinical and radiological assessment to rule out differential diagnosis. All the cases included in the study were of idiopathic etiology. The patients belonged to the age group ranging from 22 years to 50 years (mean age, 33 years). All the subjects sought medical help for cosmetic reasons fear and anxiety. Patients were classified as having neither mild, moderate or gross gynaecomastia as per Simon's classification, (Simon BE, et al., 1973) and the presence of skin excess was noted.

### Operative techniques

Pre-operatively, all patients were marked in the upright sitting position. The breast tissue was infiltrated, via a single stab incision, with a solution of normal saline, 1% lignocaine and 1:1000 adrenaline. All surgery was performed under general anaesthesia, and patients received

one dose of intra-operative intravenous antibiotics. Following the procedure, a pressure dressing consisting of gauze was applied and held in place with microfoam tape. Patients were instructed to wear a pressure garment day and night for six weeks. The following surgical techniques were used singly or in combination.

### Liposuction

Liposuction was performed following a superwet/ tumescent infiltration of the previously mentioned infiltrate. The cannula was continuously moved in fanlike long strokes, starting deep and working superficially. Special effort was made to disrupt the inframammary fold where this was well formed. The endpoint was determined by loss of tissue resistance, aspiration volume, appearance of the aspirate and treatment time.

### Open excision

A semi-circular incision was made along the inferior margin of the nippleareola complex. Dissection with scissors commenced inferiorly to the border of the breast, then proceeded in a deep plane to the upper limit of the breast. Dissection was continued superiorly to the incision leaving a 1 cm disc of breast tissue on the undersurface of the areola. Subsequently, the breast tissue was excised through the semi-circular incision.

## RESULTS

Thirty of patients and a total of 60 breasts were operated on during the study period. Ages ranged from 22-50 years (Mean 33 years). five patients were of grade 1. four and three patients were of 2 a and 2b grade. Grade 3s patients were 18. Twenty patients cited emotional problems as the reason for them seeking help, whereas one complained of pain and discomfort. Patients underwent either liposuction alone (10 breasts), excision alone (36breasts) or both excision and liposuction (14 breasts). Minor complications included seroma (2 patients), changes in sensation (2 patients) The only acute major complication encountered were haematomas not requiring evacuation in theatre (2 patients). There were two cases of wound infection documented within our patient group. Although one patient was noted to have skin excess post-operatively that may have benefited from revision surgery, this was not possible due to hypertrophic scarring. Patients were followed up for an average of 6 months . One patient did not attend again after their first post-operative appointment. The time interval between patients' operations and return of the questionnaire ranged from 6-8 months . Analysis revealed a general trend showing increased satisfaction rates as time from surgery increased.

Complication	Liposuction	Excision	Liposuction with excision
Hemetoma	1	0	1
Infection	0	2	0
Breast asymetry	0	1	0

Change sensation	1	0	1
Seroma	1	1	0
Painful scar	0	1	0
Total patients	3	5	2

## DISCUSSION

Surgery is the mainstay of treatment for gynaecomastia and although a wide range of surgical techniques have been described, surgeons often find it difficult to choose the technique that will achieve the best results for a given patient. Gynaecomastia has peaks in incidence within three age groups. This may relate to the fact that the most common trigger for surgery was emotional distress, and middleaged/older men may be less affected by this stimulus compared to the younger age group. Studies have demonstrated overall complication rates for gynaecomastia surgery as being approximately 15.5%, with the highest rate in grade I patients (21.6%). Colombo-Benkman M, et al., 1999) Our overall complication rate was slightly higher than this (22.6%). However, these were mainly minor acute complications that did not significantly affect the final result. There were no cases of nipple-areola complex necrosis or areolar tethering. Complication rates between different surgical techniques varied significantly. Overall complication rates among the excision only group was the highest (35.76%) followed by the liposuction only group (20.87%) and the liposuction and excision group (11.66%).

Conventional liposuction combined with open excision was first described as a treatment for gynaecomastia by Teimourian [8] and Perlman in 1983, and has become a widely accepted method, because of the frequent difficulty of removing breast parenchyma by suction alone. In addition, liposuction alone often requires specialised cutting cannulas, which are traumatic and increase the risk of damage to blood vessels and nerves. Pre-tunnelling and suction achieved with liposuction prior to open excision helps to taper the peripheral contour, define the glandular tissue and make the excision easier. In our series, grade III patients experienced the highest complication rate (39.92%), followed by grade II (27.18%) and grade I (23.72%). Previous studies have quoted overall revision surgery rates as 17.4%, with the highest rate in grade II patients (34.8%). (Colombo-Benkman M, et al. 1999) None of the patients in our series underwent revision surgery. Sophocles et al. 2008, found that the weight of the specimen excised was not a significant predictor of minor or acute major complications. This is also confirmed by our series of patients. It is not possible to examine whether any factors contribute to a poor cosmetic result within our series as only one patient had an unsatisfactory result.

Outcome studies of gynaecomastia correction have shown varying levels of satisfaction with the results of surgery with Fruhstorfer et al. (Fruhstorfer BH, et al., 2003) showing high levels of satisfaction while Ridha et al., (Ridha H., et al. 2009) showed much lower levels. Our series demonstrated generally high satisfaction rates amongst both patients and surgeon. Eleven patients (45.8%) had their outcome classified as 'excellent' at their second follow up appointment by the operating surgeon, 16 patients (62.64%) as 'good', 1 (4.08%) as 'satisfactory' and 1 (4.08%) as 'poor'. Patients too were generally 'satisfied' with their outcome with regards comfort and appearance. Three patients in the liposuction only group were left with a small residual lump. Despite the contour of their



chests being satisfactory, they were not satisfied with the result. In contrast, patients who underwent excision were generally very satisfied, returning the highest overall scores for satisfaction, chest shape and selfconfidence levels. The peri-areolar scar was well accepted and faded with time. Therefore, during correction of gynaecomastia with liposuction, the threshold for conversion to an open procedure show be low because it is not associated with a significant disadvantage to the patient, but rather leads to a high degree of satisfaction.

## CONCLUSION

Gynaecomastia is a complex condition, which poses a significant challenge to the plastic surgeon. The initial treatment should aim to correct any underlying abnormality or discontinuing any medications that may be contributing to the condition. Although the efficacy of medical treatment has not yet been well established, conservative measures should be considered prior to

surgery(TrellesMA,etal., 2013)

Gynaecomastia present for more than two years is unlikely to regress spontaneously or with medical treatment due to the tissue becoming irreversibly fibrotic. (Wiesman IM, etal.,2004). In these cases, surgery remains the mainstay of treatment. Despite many operative techniques being described, the principal aims of surgery remain to correct the deformity, restore normal body contour and image, maintain the viability of the nipple-areola complex and avoid excessive scarring(Teimourian B,etal., 1983).

The surgeon needs to retain flexibility, because often a final assessment of consistency, skin excess and quality is possible only during surgery. Liposuction should always be used in diffuse or large breasts. Following liposuction, the consistency of the breast should be examined, and open excision is performed if a residual lump or firmness is present. Following liposuction and open excision, the skin excess settles to some degree depending on the skin quality. Skin excision is indicated if there is still noticeable skin excess.(Laituri CA, etal., 2010). The choice of concentric or Lejourmastopexy depends on the amount of skin excess. The larger the skin excess, the more likely it is that a Lejour pattern skin resection will be needed.Although there are significant possible complications associated with surgery, our case series demonstrates that with careful planning and patient selection, outcomes of operative correction can be favourable and yield high levels of satisfaction from both patient and surgeon.

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### Original article

## A COMPARATIVE STUDY OF EFFICACY AND SAFETY OF ULTRASOUND GUIDED DOUBLE TAP BLOCK WITH CONVENTIONAL REGIONAL ANAESTHESIA FOR OPEN INGUINAL HERNIA REPAIR IN GERIATRIC PATIENTS

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**Key words :** ULTRASOUND GUIDED , DOUBLE TAP BLOCK , REGIONAL ANAESTHESIA , OPEN INGUINAL HERNIA , GERIATRIC PATIENTS

### ABSTRACT

**Background:** Geriatric patients of open hernia repair have comorbidities., **Impaired cardiorespiratory reserves ultrasound guided regional blocks nowadays very popular**

**Aims & objectives:** to explore USG guided double TAP block with conventional anaesthesia technique

**Observations and results:** Double TAP block provided less sensorimotor blockage, & prolonged Postoperative analgesia than unilateral spinal anaesthesia

**Conclusion:** USG guided double TAP block can be alternative to unilateral spinal anaesthesia in geriatric patients for open unilateral hernia repair.

KEY words: USG guided Double TAP block (TAP block,IIG ,IH block),open hernia repair, geriatric patients.

## **INTRODUCTION**

Inguinal hernia repair surgery is one of the commonest surgery in male geriatric patients . (1)

These procedures can be done under general anesthesia (GA), neuraxial anesthesia (spinal or epidural) or peripheral nerve blocks and TAP block. Geriatric patients have poor cardiorespiratory reserves so general anaesthesia may not be a good option for inguinal hernia repair surgery because it affects cardiopulmonary functions the most.

Neuraxial anesthesia (spinal or epidural anesthesia) is an attractive choice But in geriatric patients hypotension and other hemodynamic changes are often observed as autonomic nervous system response is diminished with aging and sympathetic block with epidural anesthesia cannot be controlled (2).Cardiovascular system may be profoundly affected by spinal anaesthesia due to unavoidable sympathetic blockade. Hypotension is the most frequent side effect of spinal anaesthesia, occurring in more than 30% of patients (3). In conventional spinal anaesthesia it is not possible to limit the accompanied sympathetic block that normally exceeds the sensory block by 2-6 segments (4, 5). **Ward et al** (6) reported a decrease in mean arterial blood pressure of 21.3% of the base line following spinal anesthesia. The unilateral spinal anesthesia has been claimed by many as an alternative technique, to restrict the undesired sympathetic block (7) and is useful in geriatric patients.

The transversus abdominis plane (TAP) block is a relatively new regional anesthesia technique that provides analgesia to the parietal peritoneum as well as the skin and muscles of the anterior abdominal wall (8). It has a high margin of safety and is technically simple to perform, especially under ultrasound guidance. TAP block can preserve bladder and lower limb motor function thereby assisting early mobilization after surgery.Historically described just a decade ago, it has undergone several modifications, which have highlighted its potential utility for an increasing array of surgical procedures (9). Despite a relatively low risk of complications and a high success rate using modern ultrasoundguided techniques, TAP blocks can be good alternative to spinal anaesthesia (10).

this study was undertaken to compare the safety and efficacy of double TAP (TAP,IIG,IH) block and unilateral spinal anesthesia for inguinal hernia repair surgery in geriatric patients.

## **MATERIAL AND METHODS**

The study was a comparative study conducted in the department of anaesthesiology, VS general Hospital, NHLM Medical college, AhmedabadGujarat, India, after a written informed consent was taken from all the patients. Our study had 60 adultmale patients of more than 60 years of age and of American Society of Anaesthesiologists (ASA) grade I and II divided randomly into two groups of 30 each (using sealed random envelope). They were given either Ultrasound guided double TAP(TAP,IIG,IH) block or unilateral spinal

anaesthesia for unilateral fully reducible indirect inguinal hernia repair surgery with mesh repair.

The Exclusion criteria included patients who did those not give consent, those with known hypersensitivity to local anaesthetic drugs, patients having bleeding disorders, untreated or uncontrolled co-morbidities like diabetic mellitus, hypertension, ischemic heart disease, morbid obesity and chronic renal failure, those with infection at the site of injection, patients with psychiatric disorders, and metabolic diseases. Routine investigations like complete blood counts, urine examination, bleeding time, clotting time, chest x-ray PA view, electrocardiogram and other relevant investigations were done in all patients pre-operatively. Group- T patients received Ultrasound guided (USG) Transversus abdominis plane block (TAPB) with ilioinguinal and iliohypogastric nerve block 30ml of 0.375% isobaric bupivacaine, and isobaric lignocaine 1.5% 10 ml on the side of hernia repair and Group- S patients received Unilateral spinal anaesthesia with 10mg (2.ml) of 0.5% hyperbaric bupivacaine. The same anesthetist performed all procedures in both groups. The patients were assessed thoroughly in the pre-operative room with Nil by mouth of 6 hours a good IV access was secured and intravenous fluid (ringer lactate) started at 10 ml/kg. Thereafter, patients were shifted to operation theater and all standard monitoring devices were attached which included noninvasive blood pressure, Heart Rate, respiratory rate and SpO<sub>2</sub>. All patients were connected to venturimask and were given oxygen @ 4 litres/ min throughout the intraoperative procedure. Each patient was premedicated with intravenous ondansatrom 0.04mg/kg in the operating room before the procedure. In group-R patients were placed in supine position on OT table. After draping and taking all aseptic precautions, the ultrasound guided (SonoSite, Micromaxx) transversus abdominis plane block was given using the following technique: A linear ultrasound probe (Micromaxx L 38e/10-5 MHZ) was placed transversely on the abdomen between cn and iliac crest in the mid-axillary line on the side to be blocked. The probe was then slid anteriorly or posteriorly and tilted as necessary in a cephalocaudal direction until a clear optimized image of the three lateral abdominal muscles (namely external oblique, internal oblique and transversus abdominis from outside inwards) and the transversus abdominis plane were visualized. Changing the depth and gain was used to achieve further optimization of the image. An 23G spinal needle was introduced from an antero-medial position to a posterior and lateral direction using in-plane technique with entry point in the skin being 2cm away from the probe in order to improve needle visibility in the long axis. The needle trajectory proceeded in an antero-posterior direction using in-plane technique, with local anaesthetic injection observed in real-time. A small test dose was used to confirm the transversus abdominis plane by observing the separation of fascia between internal oblique and transversus abdominis muscle. After confirming the transversus abdominis plane, total of 15ml of 0.375% isobaric bupivacaine was injected, in real time. USG guided Ilioinguinal and iliohypogastric block were given also given between internal oblique & Transverse abdominis fascial plane more cephalic than anatomical landmark guided block between iliac crest And coastal margin (22) by 10ml 0.375 % buivacaine. 10ml of isobaric lignocaine 1.5% was infiltrated from public tubercle towards umbilicus in subcutaneous plane. 3ml of 1.5% lignocaine was given during surgery after identification of neck of sac ,to

block genital branch of genitive moral nerveeffect of block was assessed by pin prick on the side of surgery every 5 minutes till 30 minutes. A successful block meant a sensory block of unilateral T10 to L1 dermatomes by 30 minutes, after which it was considered as a failure and patient was given GA.

group-S, the patients were placed in lateral position with side to be operated kept down. After taking aseptic precautions, dural puncture was performed using 25G Quinke's needle, inserted in midline at L3-L4 interspace. After dural puncture, bevel of the needle was turned towards the dependent side and 2ml of 0.5% hyperbaric bupivacaine (10mg) was injected. Lateral position was maintained for 10 minutes and then patients were turned to supine position. 10ml of isobaric lignocaine infiltration done between pubic tubercle to umbilicus to prevent pain due to stretching of rectus sheath. Then prick method (by 25G hypodermic needle) was used to evaluate sensory block. Time of onset and time taken to achieve highest dermatomal level of sensory block was recorded. Motor blockade was assessed by using modified Bromage scale at the end of surgery. Patients with inadequate block in Group S were also converted to GA. Heart rate, continuous ECG, blood pressure and SpO<sub>2</sub> were monitored and recordings were taken preoperatively, at 5 minutes intervals initially for 20 minutes, at 30 minutes, at 45 minutes, at 60 minutes and post-operatively. Patients were watched for Perioperative adverse effects like nausea, vomiting, bradycardia, hypotension, altered sensorium or seizure episodes due to inadvertent intravascular injection of LA, liver perforation, intraperitoneal injection, bowel perforation were recorded. Hypotension (defined as decrease in systolic blood pressure greater than 20% from baseline) was treated with ephedrine 6 mg IV bolus and was repeated if required. Bradycardia (Heart rate less than 60 beats per minute) was treated with 0.3-0.6 mg of atropine IV bolus.

The quality of block was assessed according to the following scale:

Numeric Scale for Quality of Block:

Grade IV: (Excellent) No complaint from patient.

Grade III: (Good) Minor complaint with no need for the supplemental analgesics.

Grade II: (Moderate) Complaint that required supplemental analgesia.

Grade I: (Unsuccessful) Patient given general anaesthesia.

Intermittent bolus of 25-50 mcg of fentanyl was given intravenously to patients who needed supplemental analgesics. All patients were observed in postoperative recovery room for duration of analgesia, time to first rescue analgesic requirement and total analgesic consumption in 24 hours. The patients were assessed for pain based on Visual Analogue scale (VAS). The patients were explain about VAS in detail. Tramadol 50 mg intravenous was used as a rescue analgesic in patients who had VAS score >3 postoperatively. Comparability of the groups was analyzed by student's t test. For intragroup comparison paired 't' test was used and for intergroup comparison unpaired 't' test was used. we used a sample size of total 60 patients (30 in each group). For all statistical analysis, the value of p

<0.05 was considered statistically significant and value of  $p < 0.001$  was considered highly significant. All statistical tests were done using SPSS software version 16.0). Graphs were prepared using Microsoft excel. Data was expressed as mean  $\pm$  standard deviation.

The various observations noted included time of onset of sensory block, time to reach maximum/highest level of sensory block, maximum motor block (modified bromage scale), duration of surgery, VAS postoperatively at 4 hourly intervals upto first 24 hours, time taken for first rescue analgesia postoperatively (duration of analgesia) and total analgesic consumption in first 24 hours, quality of block, and incidence of any adverse effects (eg-bradycardia, hypotension, nausea, vomiting, headache, bowel perforation, bladder retention etc)

**OBSERVATIONS** The baseline demographic parameters were statistically comparable in both groups (Table 1). The intraoperative hemodynamic parameters were comparable regarding Heart rate (HR), but SBP, DBP and MBP were significantly reduced in Group S (figure 1). 3patients had hypotension and 2 patients had Bradycardia in Group S while no complications were seen in Group T. The time needed to perform block and time needed for maximum level of sensory block were significantly more in Group T. There was significantly lower VAS scores in Group T (figure 2)and the duration of post operative analgesia was significantly higher in Group T (Table 2). The total dose of rescue analgesic required in Group T was significantly less (Table 2). The total fentanyl consumption was higher in Group T. a significantly higher number of patients in Group T had lower bromage scores (Table 2).

**TABLE 1 DEMOGRAPHICS**

	GROUP T	GROUP S	P value	Significance
	MEAN $\pm$ SD	MEAN $\pm$ SD	> 0 . 5N	S
AGE (YEARS)	64.4 $\pm$ 4.7	69.85 $\pm$ 6.14	> 0 . 5N	S
HEIGHT (CM)	156.0 $\pm$ 3.2	155.8 $\pm$ 3.1	> 0 . 5N	S
WEIGHT(KG)	63.45 $\pm$ 5.3	65.5 $\pm$ 6.86	> 0 . 5N	S
ASA grade (I/II)	2 2 / 8	2 3 / 7	> 0 . 5N	S
DURATION OF SURGERY (MIN)	60.24 $\pm$ 6.21	61.82 $\pm$ 6.51	> 0 . 5N	S

**TABLE 2 :COMPARISON OF SENSORY MOTOR BLOCK CHARACTERISTICS AND USAGE OF DRUGS**

PARAMETER	GROUP T (N=30)	GROUP S (N=30)	p VALUE	INFERENCE
<b>A D V E R S E E F F E C T S</b>				
B r a d y c a r d i a			0	2
h y p o t e n s i o n ( n a u s e a / v o m i t i n g )			0	3
h e a d a c h e			0	0
L A t o x i c i t y			0	0
liver perforation/ bowel hematoma, intra peritoneal injection)			0	0
U r i n a r y R e t e n t i o n			0	2
Time needed to perform block (mins)	15.22±1.55	10.20±0.52	< 0.001	H S
Time needed for maximum level of sensory block	28.0±1.29	6.68±0.74	< 0.001	H S
Modified bromage score (3/2/1/0)	0 / 0 / 0 / 30	12 / 10 / 8 / 0	< 0.001	H S
Time taken for first analgesia	941.0±23.18	240.25±5.44	< 0.001	H S
Total rescue analgesia	57.5±24.5	110±20.5	< 0.001	H S
Total fentanyl used in mcg	76.25±23.61	50.0±0.0	< 0.001	H S
Quality of block (4/3/2/1)	0 / 10 / 20 / 0	28 / 2 / 0 / 0	< 0.001	H S

**TABLE 3****ADVERSE EFFECTS****TABLE 4****QUALITY OF BLOCK IN BOTH GROUPS**

G R A D E	GROUP T (%)	GROUP S (%)
4	0 ( 0 % )	28 ( 92.5 % )
3	9 ( 30.0 % )	2 ( 7.5 % )
2	21 ( 70.0 % )	0 ( 0.0 % )

1	0 ( 0 . 0 % )	0 ( 0 . 0 % )
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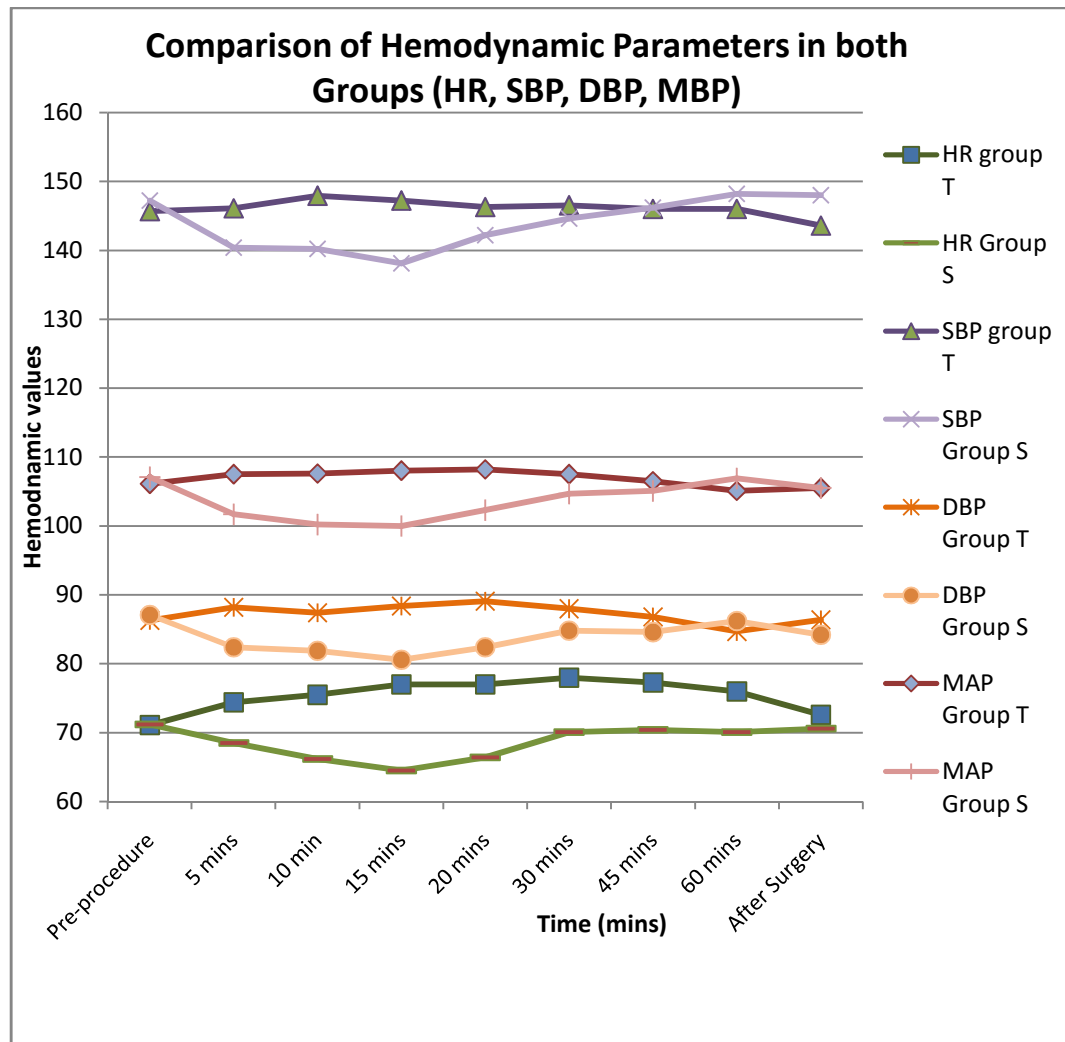
**GRADE4: Excellent**

**GRADE 3: Good**

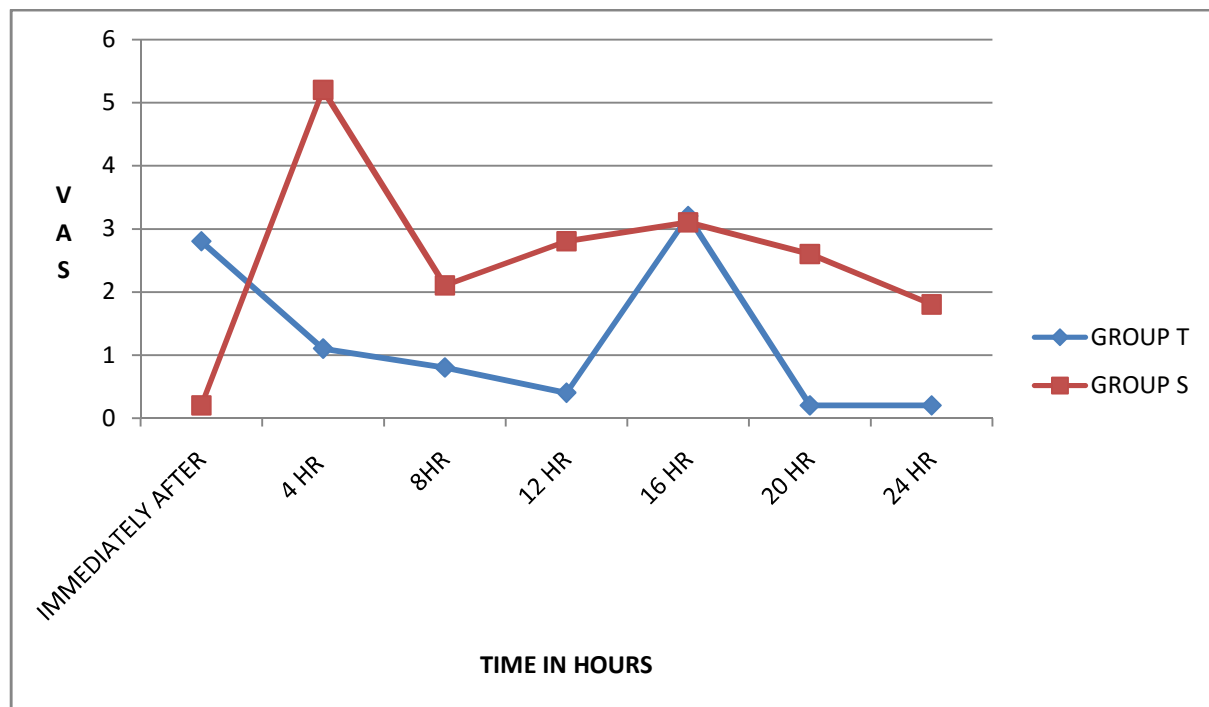
**GRADE2:MODERATE**

**GRADE1: FAILED**

**FIGURE 1COMPARISON OFPER OPRETIVE HEMODYNAMICS(n=30 in each group)**





**FIGURE 2****MEAN VAS SCORE IN FIRST 24HOURS ( n=30)**

**DISCUSSION:** Ultrasound is ramponedly used in this decade for Regional anaesthesia.as it provides better visualisation, provide precise lower dosage and better sensorimotor block with virtue of few adverse effects.ilioinguinal and iliohypogastric nerve blocks also provide regional blockage but with TAP block,Local infiltration from public tubercle towards umbilicus to curtail sensation from opposite side fingers,and infiltration at neck of sac provide total field block for unilateral hernia repair. Transverse abdominis plane (TAP) block is a holly grail of regional anaesthesia technique that provides analgesia following abdominal surgery. TAP block significantly reduces pain associated with lower abdominal surgery, regardless of whether it is used as sole anaesthetic or for postoperative analgesia USG has provided the required precision and safety to this truncal block.Time required to perform block has been also curtailed with USG guidance(22)

Unilateral spinal anaesthesia using 0.5% bupivacaine is a standard and effective regional anesthesia technique in restricting sympathetic block in all high risk patients including geriatric patients. Minimal haemodynamic changes following this technique is observed. The present study was carried with the aim of establishing the efficacy and safety of USG guided TAP,IIG,IH blocks(21) in comparison to unilateral spinal block in geriatric patients.

The DEMOGRAPHIC data of the patients in both groups (table1) were similar in age,mean height, weight and ASA grades. The duration of surgical procedure was also comparable in both groups.

The DURATION required to perform block (table 2) was greater in group T ( $15.22 \pm 1.55$  min.) in comparison to group-S ( $10.20 \pm 0.52$  min) and was found to be highly significant ( $p < 0.001$ ).

The TIME to highest/maximum level of sensory block (table 2) was higher in group T ( $28 \pm 1.29$  min) as compared to group S ( $6.68 \pm 0.74$  min) and was found to be highly significant ( $p < 0.001$ ). **Shibata et al** (2007) assessed the extent of ultrasound guided TAP block by pinprick method & found that the mean upper and lower level of sensory block at 30 min after local anesthetic injection were T10 (range, T9–11) and L1 (range, T12–L1), respectively (11). In group T of our study the time to reach the maximum level of sensory block was  $28 \pm 1.29$  min. Thus the results in our study was comparable to the above study. **Nesek Adam et al** (2011) compare between unilateral and bilateral spinal anesthesia in hypertensive patients and found the mean time for peak onset of sensory block was  $5.4 \pm 0.8$  min in their unilateral group as compared to  $5.1 \pm 0.8$  min in bilateral group (12). In group S of our study the time to reach the highest level of sensory block was  $6.68 \pm 0.74$  min which was comparable to the above two studies.

There was NO MOTOR blockade in group T whereas mean modified Bromage scale grade was  $2.05 \pm 0.55$  in group S (table 2), a highly significant difference ( $p < 0.001$ ). **Zorica Jankovic et al** (2009) also found that there are no motor deficiency in TAP block (14). In the study of **Nesek Adam et al** (2011), for comparison between unilateral and bilateral spinal anaesthesia, the mean modified bromage scale was  $2.5 \pm 0.6$  min in unilateral and  $2.4 \pm 0.6$  min in bilateral group at 15 minute of block, which is consistent with our study (12).

In group-T HR was higher compared to their pre-procedure values at all time intervals measured (figure 1). This rise in heart rate may be attributed to many factors like anxiety or inability to achieve excellent grade of block with TAP block. In group-S the heart rate was lower compared to their pre-procedure value at all time interval measured. Heart rate then returned to pre-procedure values after 20 minutes.

In group-T there were no significant changes in the systolic, diastolic and mean blood pressures (SBP, DBP, MAP) compared to their Baseline values. In group-S there was a statistically significant fall in the systolic, diastolic and mean blood pressures after giving unilateral spinal block. Hypotension was noticed in 10% patients (3 out of 30 patients), that was treated with 6.0 mg of mephentermine IV bolus. Blood pressures returned to their Baseline values after 15 minutes. In the study of **Sulagna Bhattacharjee et al** (20) systolic and diastolic BP were significantly higher in Group N (TAP block with normal saline followed by general anesthesia) in comparison to group B (TAP block with 0.25% Bupivacaine followed by general anaesthesia) (15). **K. O Connor et al** (2010) reported that there is no haemodynamic sequelae of neuraxial sympathectomy in TAP block as in neuraxial block (16). The fall in SBP and DBP after unilateral spinal was similar to study by **Casati et al** (1999) in the unilateral spinal group, They noticed hypotension in 10% patients that were treated with 100mcg of phenylephrine (17). **Nesek Adam et al** (2011) had also noticed slight decrease in blood pressure in their unilateral group. They also noticed hypotension in 10% patients (12).

The duration of analgesia (the time taken for first rescue analgesic) (table 2) was more in group-T ( $941.0 \pm 235.18$  min) as compared to group-S ( $240.25 \pm 5.44$  min). The mean VAS immediately after surgery was more in group-T ( $2.8 \pm 0.55$ ) in comparison to group-S ( $0.2 \pm 0.32$ ) (highly significant,  $p < 0.001$ ). The mean VAS afterwards was more in group-S in comparison to group-T. The finding of prolonged postoperative analgesia after USG TAPB is similar to studies by other authors. **Iyad Abbas Salman et al** (2012) have observed that traditional treatment had better pain control in 1<sup>st</sup> 2 hours whereas TAP block was better thereafter (18). Similarly in the study of **Isil Davarci et al** the VAS score was  $< 1$  up to 90 minute and increased gradually to 1, 3, 3 at 2, 4 and 6 hour respectively and then decreased to 1.5 at 24 hours, in their USA group (unilateral skontrol group (unilateral spinal anaesthesia with Bupivacaine alone) (13).

The quality of block (table 4) was better in group-S in comparison to group-T. As TAP block have no effect on visceral pain, hence quality of block were poorer in TAP group [no patients (0.0%) in grade 4 (excellent) block, 10 patients (30.0%) in grade 3 (good) block, 20 patients (70.0%) in grade 2 (moderate) block and no patients (0%) in grade 1.

Comparing the side effects and complications in both groups, there were no side effects or complications in group-T. **Karim Mukhtar et al** (2009) stated that TAP block have high margin of safety, especially under ultrasound guidance. There have been no reported complication to date with the ultrasound guided technique (20). In group-S, 2 patient (7.5%) presented with bradycardia and 3 patients (10.0%) presented with hypotension. Limiting the spread of the spinal block by giving unilateral spinal greatly reduced the haemodynamic impact, which is due to compensation by a reflex vasoconstriction in the non-blocked areas. Clinical trials comparing unilateral spinal anaesthesia with conventional bilateral spinal block have demonstrated that cardiac index values are much more stable during the former than during the latter, with a smaller reduction in arterial blood pressure and heart rate, and a much lower incidence of clinically relevant hypotension (5% Vs 20%) (**Casati et al 1999**) (17). TAP block thus provides better stable hemodynamic profile.

Regarding limitations of our study, one was the small sample size and hence future studies need to evaluate further.

## CONCLUSION:

(TAP, IIG, IH,) Double TAP block is more efficacious than unilateral spinal block for inguinal hernia repair in geriatric patients in terms of prolonged post operative analgesia, excellent hemodynamic stability with minimal incidence of adverse effects.

Lauren steffel Etal used USG guided TAP & double TAP (TAP, IH, IIG) block for open unilateral hernia repair & they found double TAP block more beneficial. (22) interns of sensorimotor blockage.

unilateral spinal block provides early onset, excellent quality of intra-operative block, limited duration of analgesia, perioperative haemodynamic adverse effects.

Double TAP( TAP ,IIG,IH)block can be used safely as an attractive alternative as sole anaesthetic technique for open hernia repair in geriatric patients who are high risk for general or neuraxial anesthesia.

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Original article

## **NON OPERATIVE VS OPERATIVE MANAGEMENT OF BLUNT HEPATIC INJURY: A RETROSPECTIVE STUDY**

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**Key words: BLUNT HEPATIC INJURY, Management ,A RETROSPECTIVE STUDY**

### **Abstract**

**Back ground:**The liver is one of the most frequently damaged organs and remains the most common cause of death following blunt abdominal trauma. During the last century, the management of blunt force trauma to the liver has changed from observation and expectant management in the early part of the 1900s to mainly operative intervention, to the current practice of selective operative and non operative management. Currently, a non operative management constitutes the treatment of choice in patients with hemodynamic stability. The objective of this study is to examine the outcomes of blunt hepatic trauma, and compare surgical and nonsurgical treatment on patients admitted with hemodynamic stability and with no obvious indications of laparotomy.

**Methods:** A retrospective study of the patients presented with blunt liver trauma was performed from 2016-2017. Variables analyzed included demographic data, cause of injury, grade of injury,

associated injuries, vitals, haemoglobin values, number of blood transfusion, mode of treatment and complications. Clinical parameters, GCS were recorded in all the patients. ultrasonography and CT scan were also done. Patients with unstable hemodynamics who responded to fluid challenge and with stable hemodynamics were included in conservative management of liver trauma. **Results:** A total of 55 patients were analyzed. 5 patients had sustained severe injuries. Mean pulse rate in conservative group was 92 beats/min. Mean blood pressure in conservative group was 110/70 mmHg. Conservative treatment was followed in 50 patients with surgery undertaken in 6 of the patients from this group due to failure of conservative treatment. Mean duration of hospital stay in conservative and operative groups are respectively 17 and 19 days. P value is significant (0.04). **Conclusions:** A non-operative approach results in lower complications, a lesser need for blood transfusions and a lower mortality rate. Failure of conservative treatment did not show a higher incidence of complications or mortality.

### Introduction

Liver and spleen together, account for 75% of injuries in blunt abdominal trauma. Though liver is the second most commonly injured organ in abdominal trauma; it is the most common cause of death following abdominal injury. The liver is although protected under the rib cage but, The large size of the liver, the friable parenchyma, its thin capsule and its relatively fixed position make it prone to blunt injury. Right lobe is more often involved, owing to its larger size and proximity to the ribs [1,2]. Compared to splenic injuries, management of liver trauma still remains a challenge in the best of trauma centres [3,4]. Initially in seventies, these patients with blunt hepatic trauma were explored immediately irrespective of hemodynamics and associated hollow viscus injuries [5]. The surgical exploration in blunt hepatic trauma can prove to be futile as active bleeding stops in about 86% of patients [6]. During the last century, the management of blunt force trauma to the liver has changed from observation and expectant management in the early part of the 1900s to operative intervention, to the current practice of selective operative and nonoperative management. Haemorrhage from a liver laceration is often self-limiting, and uncomplicated healing can occur even in relatively major liver trauma. Intervention is indicated when haemorrhage is excessive, fails to cease spontaneously, or a CT scan demonstrates an expanding central haematoma with arterial bleeding. This latter injury is unsuitable for conservative management, even if the patient is haemodynamically stable, as the expanding haematoma continues to destroy the surrounding normal liver, and eventually ruptures intraperitoneally. The advent of new diagnostic technologies in recent years, such as Computed Tomography (CT), has allowed a paradigm shift from surgical treatment to nonsurgical treatment for selected patients. The use of CT for patients with blunt abdominal trauma determines the presence of a liver injury and its organ injury scale, and excludes other significant lesions, avoiding unnecessary surgery [6-9]. Imaging techniques especially Computerised Tomographic (CT) scan has created remarkable impact in managing liver trauma patients by reducing the number of laparotomies. About 80% of adults and 97% of children are presently managed conservatively worldwide at high volume trauma centres [10,11]. With the ultrasound, FAST (focused assessment by sonography of trauma) became a standard investigation for detection of hemoperitoneum in equivocal cases [12]. The use of CT for patients with blunt abdominal trauma determines the presence of a liver injury and its organ injury scale, and excludes other significant lesions, avoiding unnecessary surgery [6-9]. The further introduction of contrast CT it was possible to classify liver injuries. Motor vehicle accidents are the most common cause of blunt hepatic trauma. These high speed accidents produce tear of III-IV segments at the level of hepatic ligament mostly causing minor grade I-III tears. [13]

### Materials and Methods

In all the patients admitted with blunt abdominal trauma or poly trauma a detailed history was taken regarding age, sex, duration and mechanism of injury. The examination of pulse rate, blood pressure, sPo2 and associated injuries was done. All patients were examined by ultrasonography. The presence of blood in peritoneum and hepatic trauma was the first criteria for inclusion in this study. The diagnostic peritoneal lavage (DPL) was not done in any of the patients instead computerized tomography (CT scan) was done in most of the patients. To analyze the results the patients were divided into two groups, Group A: non operative treatment; Group B : operative treatment. The decision as to which treatment to apply depended on the surgeon, with conservative treatment being implemented in patients fulfilling the following criteria: a) Hemodynamic stability or correct response to plasma volume expansion; b) no indication of surgical treatment due of extra and intra abdominal associated injuries, independent of Glasgow coma scale and severity of hepatic injury. Failure of non operative treatment determines that a laprotomy be carried out, after the initial decision to treat the patient non operatively.

We excluded the patients with obvious indication for surgery: hypotension, evidence of peritonitis, vascular lesions, associated lesions in the hollow viscus. We also excluded patients who required a splenectomy.

The following factors were analyzed: age, gender, cause of injury, systolic blood pressure (SBP) on admission, Glasgow Coma Scale (GCS), grade of injury according to the Organ Injury Scale of the American Association for the Surgery of Trauma (OIS-AAST), presence of associated abdominal injuries, need for blood transfusion, amount of packed red blood cells, platelets and fresh frozen plasma transfusions, complications (related and non-related to the liver), need for surgical intervention, length of hospital stay and mortality [14-19].

Those patients having persistent hypotension systolic blood pressure less than 90 mm of Hg and tachycardia pulse rate more than 110 per minute were considered in hemorrhagic shock. The resuscitation was done using a fluid challenge of Ringer's lactate is infused in short period. If there was absent response or transient response to fluid challenge the patient was considered as hemodynamically unstable. Abdominal computed tomography was done in majority of these patients and grading of injury was done. The patients who were selected for conservative management were kept under observation. The observation regarding peritoneal signs was continuously done by surgery residents even if the patient was kept in a critical care unit. Timely review was done by consultant into progress of patient. The termination of observation period and operative decision was always taken by consultant. The hematocrit values and other haematological tests were done daily. The observations were made regarding number of blood transfusions. The progress of conservative treatment was done by ultrasound even during follow up visits to rule out any long term complication. All these observations were recorded in patients' record and analyzed.

## **Results**

In this study of 55 patients, 45 were males and 10 were females. The age of these patients ranged from 15 to 65 years of age. The injuries were due to traffic accidents (46) all from height (3), and assault (2), buried under wall collapse (2), other (2).

5 patients with unstable hemodynamics were subjected to operative treatment.

The operative procedures included suturing, omental packing and perihepatic packing. Rests of 50 patients were placed on conservative treatment and were included in the study for further analysis.

The CT findings could grade the liver injury in these patients;

Grade I:

1. haematoma: sub capsular, <10% surface area
2. laceration: capsular tear, <1 cm depth

Grade II:

1. haematoma: sub capsular, 10-50% surface area
2. haematoma: intraparenchymal <10 cm diameter
3. laceration: capsular tear, 1-3 cm depth, <10 cm length

Grade III:

1. haematoma: sub capsular, >50% surface area, or ruptured with active bleeding
2. haematoma: intraparenchymal >10 cm diameter
3. laceration: capsular tear, >3 cm depth

Grade IV:

1. haematoma : ruptured intraparenchymal with active bleeding
2. laceration : parenchymal disruption involving 25-75% hepatic lobes or 1-3 Couinaud segments (within one lobe)

Grade V:

1. laceration: parenchymal disruption involving >75% hepatic lobe or >3 Couinaud segments (within one lobe)
2. vascular: juxtahepatic venous injuries (IVC, major hepatic vein)

We had grade I in (45%), grade II in (30.00%), grade III in (18%) and grade IV in (7%) patients.

## **Discussion and conclusion**

In the last 15 years, the treatment of liver trauma has progressively evolved(4,12).At the beginning of 1990's several articles reported the possibility of non surgical treatment in patients



witj hemodynamic stability similar to what is carried out by paediatric surgeons in cases of hepatosplenic injuries(9,12).The aim of this type of treatment is to not only decrease the number of non therapeutic laparotomies(13,14) but to also achieve reduction in mortality and morbidity.In this group of patients immediate surgery is substituted by initial non surgical or conservative management with close monitoring.Operative management is indicated in cases of continued hemorrhage or presence of determined underlying lesions.

Therapeutic evolution has become possible thanks to the diffusion of imaging techniques such as abdominal CT Echocardiography which are more rapid,sensitive and specific in the diagnosis of abdominal injuries and have replaced paritoneal lavage because of its low specificity and bad prediction of the need for lapotomy(17) despite its high sensitivity and speed of application.In our case series based on hemodynamic stability patients were subjected for abdominal CT with contrast to provide better knowledge of his liver injury and his further management. In the series published recently, the applicability of conservative treatment in patients with liver injury has varied from 35% to 82% [6,16] according to the year, the selection criteria and the number of patients studied. The two main variables guiding the therapeutic approach were hemodynamic instability and the need for transfusion [19-21]. In our centre conservative treatment was implemented in almost 50% of the cases in the last 5 years with a failure rate of 21%, which is slightly higher than what has been reported in the literature [6]. There are no predictive criteria to allow either the selection of the type of adequate treatment or to predict the failure of conservative treatment. Thus, the application of conservative treatment in cases of liver trauma obliges the surgeon to perform continuous monitorization of the patient during the first 48 hours and to have adequate infrastructure to allow immediate surgery on observation of clinical deterioration of the patient [7]. During the first years most series limited the cases to non-severe injury (grade  $\leq$  III) [5], restricting the use of conservative treatment to values below 40% of the cases. Later, the good results achieved led to progressive widening of the inclusion criteria.

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## **STUDY OF EFFECT OF CAFFEINE PRESENT IN COFFEE ON VISUAL AND AUDITORY REACTION TIMES ON FIRST YEAR MEDICAL STUDENTS**

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**Key words: CAFFEINE PRESENT , VISUAL AND AUDITORY REACTION TIMES**

### **Abstract**

Introduction: Caffeine present in coffee is known to be consumed by students and professionals to allay sleep and bring about concentration. Coffee being one of the mostly widely used beverages, its effect on auditory and visual reaction time is the topic of study.

Purpose : this study is aimed at checking out if caffeine present in coffee can alter the visual and auditory reaction times in the subjects.

Materials and methods : The study was conducted on 77 medical students out of which 42 were male and 35 were female medical students. The students were not habitual coffee drinkers and were experiencing the effect of caffeine on their auditory and visual reaction times.

Results : We found that caffeine had significantly reduced the auditory and visual reaction times in both male and female medical students.

Conclusion : consumption of caffeine in the form of coffee can significantly aid students and professionals in concentration and thus reinforces the concept of usage of this beverage within limits.

### **Introduction**

Caffeine is one of the most commonly used substance found in everyday beverages like tea and coffee. It is an alkaloid compound and is actually a bitter substance found in coffee beans, cocoa beans and many other plant products. The scientific name for caffeine is 1,3,7-trimethylxanthine(1) It is considered as one of the most commonly used psychoactive drug in the world. But used judiciously within limits it is known to have many beneficial effects. The USFDA considers moderate intake of caffeine to be 'SAFE'.

Caffeine is known to stimulate the central nervous system. Mild cortical stimulation appears to be beneficial resulting in more clear thinking and less fatigue. Caffeine in low doses is capable of causing desirable improvement of physical and cognitive functions. Safe doses of caffeine are considered to be around 300 mg/day in an adult(2,3). Beneficial doses of caffeine which

increased motor and mental performances range to about 65 to 130 mg of caffeine in a single take.

But the usage of caffeine is also considered to be addictive in nature. Certain amount of psychic dependence or habituation develops from the usage of caffeine. Regular use and dependence on caffeine is known to cause cravings for this substance in the form of nervousness, headache and irritation(4). But overall the benefits of moderate caffeine usage mostly outweigh the dis-benefits.

Considering the beneficial effects of moderate caffeine usage the present study was done with a motive to find the effects of caffeine present in a standard cup of coffee on visual and auditory reaction times.

Reaction time is a simple and effective method of studying central neuronal processing and is a simple method of determining sensory-motor association, performance and cortical arousal. It is the time that elapses between a person being presented with a stimulus and the person initiating a motor response to the stimulus. Apart from the time required for sensory motor association this is the time required by the brain for perceptual decision making and motor planning (6)

Considering the effects of caffeine on improved concentration, improved attention span and other cognitive effects we decided to study the effects of caffeine on reaction time which needs good reflexes and integrated information processing in the synapses as well as in the CNS. We also had to decide on doses of caffeine so that it fell into the range where beneficial effects of caffeine would be manifested.

### **Materials and Methods**

The study was conducted on 77 first year medical students of grant government medical college in the department of physiology when the authors were posted there. Informed consent from the subjects and Approval from the institutional ethical committee was taken to conduct the study. Entire batch of 200 students were requested to enroll for the study. But those who turned up for the study at their own will were primarily considered. Habitual coffee drinkers were excluded from the study to discard the effects of caffeine dependence. Subjects being first year medical students were mostly of the same age range. Too obese or too lean subjects were excluded from the present study.

Coffee sachets from a well-known coffee brand were taken as a source of caffeine. One coffee sachet of 1.5 gms contained 47.5 mgs of caffeine. 2 gms of coffee powder were used for making one cup of coffee which contained around 63 gms of caffeine. Considering the fact that beneficial dose of caffeine for increased mental and motor performance is taken to be around 65 to 130 mgs of caffeine our coffee dose came to near ideal doses.(7)

Subjects were tested for reaction times 'before' and 30 minutes 'after' the intake of coffee as the effects of caffeine are known to be more pronounced within the first hour of coffee intake(8). Reaction times (RT) measurements were done in the form of auditory reaction time (ART) and visual reaction time (VRT).

Reaction time (RT) apparatus (Anandagencies ,Pune) was used for the study. It has a built-in 4 digit chronoscope and display accuracy of 1ms. Recordings were taken in the morning time. Subjects came with as usual normal breakfast. Recordings were taken 'before' and 30 minutes 'after' the intake of standard cup of coffee as mentioned before. ART was recorded for auditory beep sound stimulus and VRT for red light stimulus. The subjects were given visual and auditory stimuli from the front to avoid the effect of lateralized stimulus. They were instructed to release response key with their dominant hand as soon as they perceived the visual or auditory stimulus. Before starting with the actual test Subjects were given adequate exposure to get acquainted with the working of the apparatus.(5,9).

### **Statistical analysis**

Statistical analysis for this study was done using Graphpad prism 5 software. Students t(paired ) test was used for analyzing the results on the same set of students before and after coffee intake. Data is presented here as mean $\pm$ sd. p values of less than 0.05 were accepted as indicating significant differences between pre and post coffee tests for RT.

### **Results**

Results are summarized in tables 1 and 2.

Data was analyzed separately in male and female medical students. In both the genders caffeine was found to significantly decrease the reaction time. Decrease in reaction time was found in both VRT and ART.

Table 1

Effect of caffeine on 42 male medical students on their Auditory reaction time(ART) and Visual reaction time(VRT) with B showing RT before intake of caffeine and A showing RT 30 minutes after intake of caffeine.

n=42 males	B	A	p value
ART	243.5 $\pm$ 10.43	231.5 $\pm$ 12.38	< 0.05
VRT	200.2 $\pm$ 7.77	186.6 $\pm$ 12.01	< 0.05

ART and VRT values are in ms and expressed as mean  $\pm$  sd

Table 1

Effect of caffeine on 35 female medical students on their Auditory reaction time (ART) and Visual reaction time(VRT) with B showing RT before intake of caffeine and A showing RT 30 minutes after intake of caffeine.

n=35 females	B	A	p value
ART	243.0 $\pm$ 10.35	228.8 $\pm$ 11.32	< 0.05
VRT	199.8 $\pm$ 10.22	183.0 $\pm$ 11.60	< 0.05

ART and VRT values are in ms and expressed as mean  $\pm$  sd

## **Discussion**

Caffeine in the form of coffee is the world's most widely used psychoactive substance. But the use of caffeine is legal and widely accepted, unlike other psychoactive substances. Caffeine is most commonly consumed by humans in infusions extracted from the beans of coffee plants. The USFDA lists caffeine as a "Multiple purpose generally recognized as safe food substance". (10) Evidence for behavioural effects of caffeine is well documented in the literature. It is associated with increased subjective alertness. However, there are debates on whether such changes are in fact improvements or merely reversal of the negative effects of caffeine dependence (11,12). To counter these confounded doubts, we chose to administer caffeine in those subjects who were not habitual coffee drinkers.

The widespread consumption of coffee in the absence of a clear definition of physiological and behavioral spectrum of action has continued to stimulate research. Much of the research done so far has produced inconsistent results. Mental performance where speed, endurance or vigilance was required showed reported benefits from caffeine intake. (13)

Studies done on caffeine intake have shown both positive as well as negative effects on response accuracy. Possible reasons for the contradictory findings could be due to differences in dose, protocol, task and subjects. The reaction time being made of sensory, decision and motor components, it depends on which of these components caffeine has a major role to play.

In our study, the effects of caffeine were seen to improve the reaction times in both the visual as well as the auditory scales. Studies done by Bullock and Gilliland (14) on the auditory modality have shown speeding up of the sensory component of brainstem auditory evoked potentials. This finding suggests that caffeine keeps the auditory sensory pathways alert, probably at the brainstem level.

Similarly, studies done by Tharion et al (15) on both auditory and visual stimuli showed caffeine to significantly ignore distracting or irrelevant stimuli, thus helping the subjects focus more on the task, thereby giving rise to improved reaction times. Also, studies done by Lorist et al (16) showed the effect of caffeine in reducing VRT by stimulating the input and output stage of the information processing system.

The study done by Lorist et al also supported the view that caffeine increases cortical arousal and perceptual sensitivity, and that the stimulating effect of caffeine was mainly located at the input and output stages of the information processing. Caffeine did not seem to affect the central processing.

Caffeine to a certain extent also altered the energetical states of the subjects. Ingestion of caffeine within physiological limits caused the subjects to experience a decrease in fatigue, lesser drowsiness, enhanced wakefulness or increased energy. (16,17)

All these factors including improved information processing, alertness, decreased fatigue, and increased concentration could be responsible in bringing out the response obtained in our study.

Conclusion:

On the basis of our present study we could arrive at the conclusion that caffeine intake within 'Safe' and physiological limits could definitely help in improving the reaction times in subjects. In our study ART as well as VRT was shown to improve with supervised doses of caffeine in the form of coffee.

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### Original article

## EFFECT OF TOTAL DOSE PARENTERAL IRON ON CARDIOVASCULAR FUNCTION IN IRON DEFICIENCY ANEMIA

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**Key words:** TOTAL DOSE PARENTERAL IRON , CARDIOVASCULAR FUNCTION

### ABSTRACT:

**Introduction:** Iron deficiency is a whole spectrum of clinical manifestation and abnormalities in the physiological functions of the body organs and tissues at rest or during stress, primarily or secondarily to iron deficiency.



**Material and Methods:** This study was conducted at a tertiary care hospital. A group of thirty five patients of iron deficiency anaemia who had a baseline change in their ECGs were selected. Iron deficiency anaemia was defined as haemoglobin < 10g/dl with a ferritin level of <30µg/L. The patients were then given the required total parenteral iron dose in the form of iron sucrose.

**Results:** The study noted a significant improvement in electrocardiogram of the patients. Twenty one of the thirty five patients had a normalization of their ECGs with best results seen with juvenile pattern, followed by occasional VPCs and ST-T changes showing the least improvement.

**Discussion:** An improvement was noted in ejection fractions the patients with a low ejection fraction compared to those with a higher ejection fraction. The study noted a significant improvement in the complaints such as fatigue, leg cramps and menorrhagia.

**Conclusion:** All these changes were however not associated with a significant increase in haemoglobin levels, thereby showing that iron per se has a significant role in the integrity of the cardiovascular system as well as in the metabolism of the cells in general.

## INTRODUCTION

Iron is an essential element for the function of all body cells. It plays a critical role in cell-cycle regulation, electron transport in the respiratory chain, DNA synthesis and other metabolic reactions. Its availability is crucial for the functioning of oxygen binding molecules such as haemoglobin and myoglobin, and many iron containing enzymes including the cytochromes in the mitochondria<sup>i</sup>.

Iron deficiency is the most common nutritional deficiency worldwide; it affects nearly 1.6 billion people<sup>ii</sup>. Iron deficiency and iron deficiency anaemia are often encountered in the general population, particularly among children and women with abnormal uterine bleeding<sup>iii</sup>. Menorrhagia, defined as blood loss of >80ml per menstrual cycle may result from systemic diseases or reproductive tract abnormalities<sup>iv</sup>. Among women of reproductive age, the prevalence of abnormal uterine bleeding ranges between 10% to 30%<sup>v</sup>. Iron deficiency anaemia is also commonly reported in patients with certain chronic conditions such as chronic kidney disease, inflammatory bowel disease, chemotherapy induced anaemia, chronic heart failure, trauma and as a consequence of certain surgical procedures.

Absolute iron deficiency is characterized by low serum ferritin levels (typically defined as ferritin levels <100 mcg/l) and low transferrin saturation values (<20%). It is commonly encountered in patients who experience blood loss during chronic or acute illness or trauma, those with poor intake or decreased gastrointestinal absorption of iron from dietary sources, and those in whom physiological demand for iron is increased, such as pregnancy, infancy and adolescence<sup>vi</sup>.

Anaemia, defined by the WHO as haemoglobin <11g/dl is frequently seen in the postpartum period and affects 4-48% of women who gave birth. In one study, up to 30% of women in the postpartum period had anaemia and approximately 10% suffered from severe anaemia, with haemoglobin levels less than 9g/dl. Iron deficiency is the most common cause of post partum anaemia, and its prevalence is greatest in women from ethnic minorities and low income families.

While the major portion of iron exists in the body as haemoglobin, iron is also an important constituent of myoglobin in muscles and of various heme and non-heme iron dependent enzymes present in every cell, playing a vital role in cellular respiration and a host of other biochemical reactions. An appreciation of the essential role of iron in the normal

functioning of body tissue as a constitute of energy backbone required for various physiological processes would make one realize how some of the manifestations observed in patients of iron deficiency anaemia could be, and indeed are due to iron deficiency per se independent of the anaemia. These manifestations can occur with haemoglobin within a normal range. In order to emphasize the role of iron in physiological processes and to classify situations where clinically significant effects are seen due to iron deficiency in the absence of or independent to the anaemia, a concept of iron deficiency is essential. Iron deficiency can thus be defined as the whole spectrum of clinical manifestation and abnormalities in physiological functions of body organs and tissues at rest or during stress, primarily or secondarily to iron deficiency.

It has been adequately shown that in iron deficiency states, normal functioning of several body tissues such as myocardium, peripheral nerves, jejunum, brain, liver and kidney is significantly altered and that this is primarily as a result of iron deficiency at the cellular level. These adequately justify the broad concept of iron deficiency syndrome, a term which should replace the conventional but restricted term iron deficiency anaemia.

Several studies have consistently shown that iron deficiency per se and not anaemia is responsible for the deterioration of cardiac function in patients with iron deficiency anaemia as evidenced by improvements with parenteral iron therapy in such patients of electrocardiogram and 2Decho before significant rise in haemoglobin levels occur<sup>vii,viii,ix</sup>. This study aims to consolidate these findings and to assess the actual role of iron over cardiovascular as well as other systems. Primary aim was to evaluate the improvement in electrocardiogram of patients with iron deficiency anemia, following parenteral iron therapy. Also to look for an improvement in ejection fraction of the left ventricle in patients with iron deficiency anemia, following parenteral iron therapy. We correlated these improvements with an increase in hemoglobin levels. Our secondary aims were to assess the effect of parenteral iron therapy on organs and organ systems other than cardiovascular system.

## **MATERIALS AND METHODOLOGY**

This study was conducted at Sheth VS General Hospital, Ahmedabad, a tertiary care hospital. A group of thirty five patients of iron deficiency anaemia who had a baseline change in their electrocardiogram were selected.

Iron deficiency anaemia was defined as haemoglobin < 10g/dl with a ferritin level of <30µg/L. The patients were explained about the nature of their disease and the study and consent was taken for their participation in the study as well as for receiving intravenous iron sucrose. A baseline 2D Echo was done for each patient and the patients were interviewed, examined and evaluated. The patients were then given the required total parenteral iron dose in the form of iron sucrose in divided doses of 200mg 12hrly under strict monitoring for vital signs and development of any adverse reactions.

The dose for the same was calculated using the following formula:

$$\text{Iron requirement (mg)} = [2.4 \times \text{body wt (kg)} \times (15 - \text{Hb in g/dl})] + 500 \text{ (for stores)}$$

Twenty hours following the last dose of iron the patients were again assessed for symptomatic improvements/ worsening and adverse reactions. A fresh electrocardiogram and a follow up 2D Echo were performed in these patients and any changes therein were noted.

### **INCLUSION CRITERIA**

1. Proven iron deficiency anaemia (as defined above)
2. Baseline electrocardiographic changes (occasional ventricular premature contraction, juvenile pattern, minimal ST-T changes)
3. Age between 25 and 60 years.

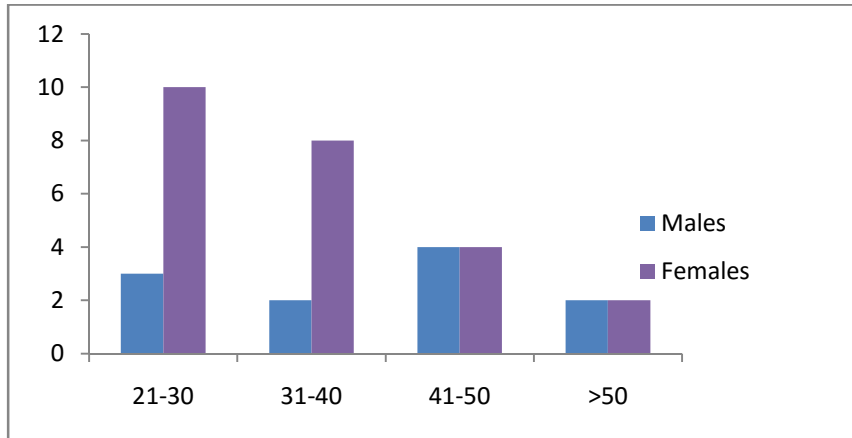
### **EXCLUSION CRITERIA**

1. Anaemia of other causes (chronic disease, genetic defects, B12 deficiency, etc.)
2. Severe anaemia needing Blood transfusion
3. Age < 25 or > 60 years
4. Normal baseline electrocardiogram
5. Ischemic heart disease or serious arrhythmias on baseline electrocardiogram
6. Regional wall motion abnormalities on 2D Echo.
7. Patients who did not give consent for the study/intravenous iron therapy.

## OBSERVATIONS AND RESULTS

The study consisted of 35 patients of which 24 were females and 11 were males. The mean age was 37.54 years.

**Figure-1**



The mean ferritin level of the patients was 15.05 and the mean haemoglobin of the study population was 8.41 g/dl at the start of the study which increased to 9.10 g/dl at the end of the study. ( $p > 0.01$ , not significant)

**Table-1**

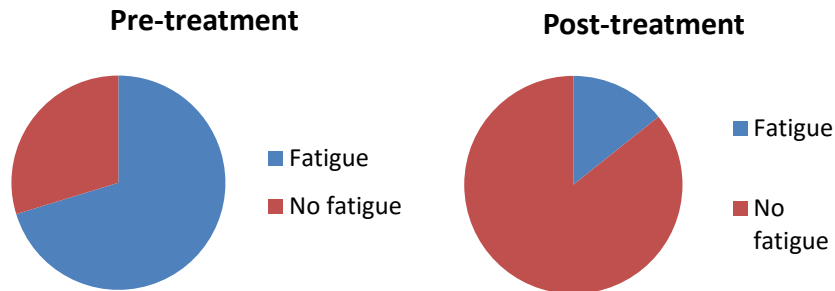
Haemoglobin (gm %)	No. of patients (pre-study)	No. of patients(post-study)
<8	12	8
8-8.99	13	10
$\geq 9$	10	17

The three ECG changes included in the study included occasional VPCs, minimal ST-T changes and juvenile pattern. 21 of the 35 patients recorded a normalization of their ECGs. ( $p < 0.05$ , significant)

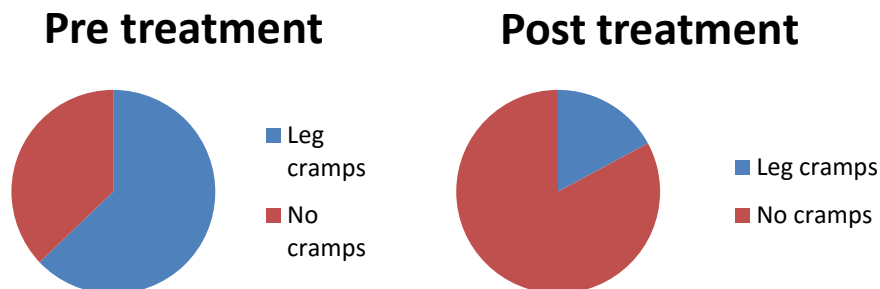
**Table-2**

	Pre-treatment	Post-treatment
VPCs	10	4
ST-T changes	10	6
Juvenile pattern	15	4

The following chart shows the EF% of the patients before and after IV iron therapy.

**Figure-2**

Sixteen of the twenty two patients who had leg cramps reported an improvement in their cramps whereas 6 patients noticed no change. ( $p < 0.01$ , significant). Of the 20 patients having joint pain at the start of the study, 5 had an improvement, 9 had no change and 6 noted a worsening of their symptoms. ( $p > 0.01$ , not significant).

**Figure-3**

All seven patients who had menorrhagia noticed an improvement in their symptom after intravenous iron treatment. ( $p < 0.01$ , significant). Of the four patients with chest pain, two noticed an improvement while two noticed no change in their symptom. Eleven patients had gastrointestinal disturbance at the start of the study in the form of nausea, constipation or dyspepsia. Two patients noted an improvement; seven had the same symptoms, and two noticed worsening of the symptoms whereas eight previously unaffected patients noticed new symptoms.

## SUMMARY AND CONCLUSION

35 patients with iron deficiency anaemia with electrocardiogram changes were included in this study to evaluate the cardiovascular effects of total dose parenteral iron therapy. The study noted a significant improvement in electrocardiogram status of the patients. 21 of the 35 patients had a normalization of their electrocardiogram with best results seen with juvenile pattern (11 out of 15), followed by occasional ventricular premature contraction (6 out of 10) and ST-T changes showing the least improvement (4 out of 10). No age or gender association was found for the same with patients of all age groups and both sexes noting equal improvements.

This findings are in correlation with studies conducted by Verghese et al, Pathare et al, Gardner et al, EJ Butchart et al and Mehta et al<sup>x, xi</sup>. As far as ejection fractions were concerned an improvement was noted in the patients with a low ejection fraction compared to those with a higher ejection fraction, however the improvement was not found to be statistically significant.

This shows correlation with the findings of Alvares and Mahmood while in contrast to those of Bhadra as well as Sagouri<sup>xii, xiii</sup>. However these studies evaluated an improvement in the ejection fraction of the test subjects 7 days after intravenous iron possibly resulting in the difference of results. The study also noted a significant improvement in the complaints such as fatigue, leg cramps and menorrhagia. No significant associations were noted in complaints like joint pain and chest pain whereas there was a worsening of gastrointestinal symptoms noted in the study population.

All these changes were however not associated with a significant increase in haemoglobin levels, thereby showing that iron per se has a significant role in the integrity of the cardiovascular system as well as in the metabolism of the cells in general.

This has been correlated with several studies including those by Mehra et al, Bhadra et al, Alvarez et al, Hall et al, Gregory et al and Lee et al<sup>xii, xiv, xv, xvi</sup>.

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**Original article****A BEGINNER SURGEON'S EXPERIENCE OF MINIMAL ACCESS SURGERY AT TERTIARY CARE HOSPITAL**

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**ABSTRACT:**

**Introduction:** Minimal access surgery is the need of the hour for departments of surgery running throughout the country. Laparoscopic surgeries are being performed routinely in surgical departments with increasing frequency. Basic laparoscopy surgeries are nowadays incorporated in training programs for post graduate students. Therefore it is important for a surgeon to achieve enough experience in basic laparoscopy and move on to advanced laparoscopic procedure for benefit of the continuing field of surgical education

**Material & Methods:** in this prospective observational study, 120 cases of laparoscopic surgery performed at department of general surgery, AMC MET MMC were reviewed in terms of age & sex distribution, mean operative time & post op complications.

**Results:** out of 120 cases performed, 28 lap appendicectomies (23.3%), 51 lap cholecystectomies (42.5%), 27 lap hernias (22.5%), and single case of hydatid cyst of liver, nephrectomy, hiatus hernia, and ventral rectopexy were performed. Age & sex distribution of cases, the mean operative time & post-operative general complications of laparoscopy were comparable to reference data & were found satisfactory.

**Conclusion:** laparoscopy surgery is a rapid advancement in field of general surgery and should be integrated in routine curriculum as well as practice of any surgical training institute. However sufficient experience should be gained in basic laparoscopy before progression towards advanced stages of laparoscopy surgery.

**KEYWORDS:** laparoscopy, minimal access surgery, appendicectomy, cholecystectomy, hernia.

**INTRODUCTION:** Laparoscopic surgery has become a necessity in a surgical department nowadays and is being performed with increasing frequency nationwide in tertiary care centers. Basic & advanced laparoscopy techniques have established themselves as gold standard in management of diseases of appendicitis, gallbladder calculi, inguinal & hiatus hernia. For any center well equipped with necessary technical setup it has become mandatory to provide facilities and skill demanded for laparoscopic surgery. We put forward our experience of various basic as well as advanced laparoscopic procedures performed at AMC MET medical college and hospitals over the past one year.

**MATERIAL&METHODS:** Data of all laparoscopic surgeries performed from January 2016 to January 2017 was retrospectively reviewed. IRB at AMC MET medical and LG hospitals Ahmedabad approved this study. A total of 120 laparoscopy surgeries were performed during a period of twelve months from 3/1/16 up-to 3/1/17. 61 cases of cholecystectomy, 28 cases of appendectomy, 26 cases of inguinal hernio- plasty (TEP &TAPP),1 case of Nissen's Fundoplication, 1 case of Umbilical Hernia repair, 1 case of Nephrectomy, 1 case of Hydatid cyst exploration& Ventral Rectopexy were performed. A follow up period of 6 months was selected to observe general complications of laparoscopic surgery.

**Inclusion Criteria:** Only elective cases were selected for laparoscopy. Patients of calculus cholecystitis were selected for interval cholecystectomy. Patients of simple appendicitis with emergency presentation were selected. Patients of uncomplicated unilateral and bilateral inguinal hernia & Umbilical hernia were selected. A patient of type 1 hiatus hernia& a patient of Hydatid cyst of liver were selected. Patient of unilateral non functioning kidney & isolated rectal prolapsed were selected for Laparoscopic Nephrectomy & Laparoscopic ventral rectopexy respectively.

Laparoscopy surgery was performed after diagnosis, pre-operative preparation and anaesthetic workup. All Pt were operated in a sterilized operative theatre and all universal pre- cautions were followed. Pnuemo-peritoneum was created using closed Veress needle method, and IAP between 8-15 mm hg were kept depending upon type of surgery and operative findings. Optical xenon light source and 30\* camera with Full HD three chip camera system was used.All patients were evaluated on age, sex, and ASA grade, pre-operative co-morbidities, intra-operative findings, intra-op complications rate & indications for conversion to open procedure, mean operative time, post-operative stay &general complications of laparoscopic surgery.

### **OBSERVATIONS:**

All patients of appendicitis were operated on index admission within 24 hrs of admission. The mean age of patients undergoing Laparoscopic Appendectomy was 21.1 yrs, the youngest 10 yrs and oldest 42 yrs. 18(64.2%) were females and 10(35.8%) males. All patients were operated by 3 port laparoscopic appendectomy technique. Intra-op findings were inflamed appendix in 92.5% (26), pus collection 7.1% (2) & bowel adhesions in 10.7% (3). Position of the appendix was retro cecal in 67.85% (19), pelvic in 25% (7) & pre ileal in 7.1% (2). Mean operative time was 37.2 min and none of the pt required conversion to open surgery. Postoperative complications were seen in 4(14.2%) pts, with 1 URTI, 2 Fever, 1 wound infection which were treated successfully. Mean post operative stay was 72.8 hrs (3 days). No mortality was reported in our study.

All cases selected for laparoscopic cholecystectomy were elective. All patients of cholecystitis were operated on interval basis admitted 6 weeks after the initial episode of cholecystitis. The mean age of patients under- going Laparoscopic cholecystectomy was 47.1 yrs youngest 18 yrs& oldest 79 yrs. 50 were females and 11 males. Pre op morbidities were diabetes mellitus 18 (29.5%), hypertension 23 (37.7%), LVD 3 (4.9%), acute bronchitis 1 (1.6%). All patients were

operated by standardized 4 port technique. Cystic duct and artery were secured by metal clips in 55 (90.1%) & intra-corporeal suturing 6 (9.9%). Intra-op findings were calculous cholecystitis in 53 (86.8%), bowel adhesions 12 (19.6%), mucocoele in 7 (11.4%), perforated gall bladder 2 (3.2%). Mean operative time was 76.4 min and 2 patients required conversion to open surgery. Indications for conversion were intra operative bleeding & duodenal adhesions respectively. Post op complications were seen in 11 (18.03%) pts vomiting 6, fever 3, URTI 1, sub-acute intestinal obstruction 1. All complications were managed conservatively. The mean postoperative stay was 3.7 days. No mortality was observed in our study.

Only uncomplicated reducible cases of direct & indirect inguinal hernia were selected. All cases were elective. The mean age of pts was 49.3 yrs, youngest 15 yrs & oldest 75 yrs. All 26 patients were males. 20 (76.9%) were unilateral and 6 (23.7%) were bilateral inguinal hernia. 16 (61.5%) were indirect & 10 (38.4%) direct inguinal hernia. Pre-op morbidities were diabetes mellitus 3 (11.5%), hypertension 4 (15.3%), LVD 1 (3.8%). 24 cases were operated by TEP and 2 cases by TAPP repair. The mean operative time was 84.2 min. post op complications were URTI 1 (3.8%), inguinodynia 1 (3.8%). 1 pt required conversion to open surgery. The mean post op stay was 2.7 days. Pts were followed up over a mean period of 6 months with max follow up 9 months without any recurrence. There was no mortality.

A 63 yrs male pt of hiatus hernia was operated by Lap Nissen's fundoplication using 5 port technique. the operative time was 92 min. there were no intra op or post op complications and pt was followed up for 6 months without recurrence of symptoms.

A 50 yr male pt of hydatid cyst of liver was operated laparoscopically. The operative time was 91 min. there were no intra op or post op complications. Drain was removed on day 7. Pt was followed up over a period of 6 months with no symptoms or recurrence.

A 46 yr female patient of unilateral non functioning kidney was operated for laparoscopic nephrectomy by standardized trans-peritoneal 4 port technique. Operative time was 156 min. Paralytic ileus was observed post operatively and resolved with conservative management.

A 56 yr female patient of isolated rectal prolapse was operated for laparoscopic ventral rectopexy by standardized 3 port technique. Operative time was 137 min. post operative recovery was found uneventful over follow up of 4 months.

A 32 yr female patient of small umbilical hernia was operated for IPOM repair by standard 4 port technique. Operative time was 97 min. recovery was uneventful with follow up of 8 months.

**DISCUSSION:** In all cases of laparoscopic appendicectomy, pt epidemiology, the mean operative time, post op stay & the complication rates were comparable with reference studies and international data. All cases of emergency and elective presentation were managed laparoscopically & no cases required conversion to an open procedure. Difficult intra op presentations such as localized abscess and gangrenous appendicitis could be managed laparoscopically without a significant change in mean operative time or complications.

In all cases of laparoscopic cholecystectomy, pt epidemiology, mean operative time, mean post op stay, and complication rates were comparable to international data. Significant pre op morbidities such as

Type of Surgery	Avg Age (yrs)	No. of Surgeries	Avg op. time (min)	Avg Post op. stay (days)	Complications (%)
Lap Appendectomy	21.1	28	37.2 min	3 days	4%
Lap Cholecystectomy	47.1	51	76.4 min	3 days	14.8%
Lap Inguinal Hernia repair	49.3	26	84.2 min	2.7 days	14.2%
Lap Nissen's fundoplication	63	1	78 min	5 days	-
Lap Hydatid cyst aspiration	50	1	90 min	7 days	-
Lap Nephrectomy	46	1	156 min	7 days	100%
Lap Umbilical hernia	32	1	97 min	3 days	-
Lap Ventral Rectopexy	56	1	137 min	5 days	-

Diabetes and hypertension were successfully operated laparoscopically without significant complications. Difficult cholecystectomies could be managed laparoscopically & advanced techniques such as intra corporeal suturing were performed at the cost of prolonged operative time. Conversion rate to open procedure was lower compared to international data in our study. No post-op bile leak or fistula was observed in our study. Generalized complication rate was also lower in our study compared to reference data.

In all cases of TEP, TAPP & Umbilical hernioplasty, mean operative time, duration of post op stay, post op pain (VAS), were higher compared to reference data. Small size of sample population might be a factor. Over a comparable follow up period no recurrences or mesh related complications were observed. Initial increased operative time was comparable with reference data with increasing pt experience.

Single cases of advanced laparoscopic procedures such as lap Nissen's fundoplication, lap Hydatid cyst aspiration, lap rectopexy & Lap nephrectomy were also performed with encouraging results.

**CONCLUSION:** Laparoscopic surgery is a rapidly growing sub specialty. Laparoscopic approach has become gold standard in management of acute appendicitis, cholecystitis etc. and quickly gaining popularity in management of several other abdominal as well as thoracic surgical diseases. A surgical training institute must focus on performing of basic laparoscopic surgeries such as lap appendectomy or cholecystectomy on routine basis before performing more advanced surgeries laparoscopically. It is recommended for any surgeon learning

laparoscopic surgery to perform adequate number of basic laparoscopic surgeries and acquire ample experience before performing more difficult surgeries and advanced laparoscopic maneuvers.

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### Original article

## A STUDY ON EFFECTIVENESS OF SINGLE DOSE ANTIBIOTIC THERAPY IN LAPAROSCOPIC CHOLECYSTECTOMY TO PREVENT SURGICAL SITE INFECTIONS

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**Key words: SINGLE DOSE ANTIBIOTIC THERAPY ,LAPAROSCOPIC  
CHOLECYSTECTOMY ,PREVENT SURGICAL SITE INFECTIONS**

### **Introduction:-**

The prophylactic use of antimicrobial agents to reduce the postoperative infection is widely practiced<sup>1</sup>. The objective of preoperative antibiotic prophylaxis is to prevent postoperative infections. Rational use of antibiotic is extremely important as injudicious use can adversely affect the patient, cause emergence of antibiotic resistance and increase the cost of health care<sup>2,3</sup>.

Antibiotic resistance has become a global menace, and WHO in 2012 had given a clear call to reduce the antibiotic use and prevent resistance to antibiotics<sup>4</sup>.

Several evidences have shown that strict aseptic technique alone could decrease but not eliminate the contamination of the surgical field completely. Therefore, the need for antibiotics to complement aseptic technique is now being widely recognized and accepted<sup>5</sup>.

In spite of wide knowledge about the effectiveness of antibiotic prophylaxis, administrative regimens are often inappropriately practiced. Main concern is the duration of prophylaxis, which is often longer than recommended<sup>6,7</sup>. Antibiotic prophylaxis is a preventive method in which antimicrobial agents are used prophylactically to combat the infectious complications in a therapeutic procedure. In conventional practice, antimicrobials are used for a predetermined period after therapeutic procedure to combat the infection<sup>8</sup>.

Most often in government hospitals, where the environmental hygiene is not adequately maintained and over load of surgical patients with the fear of development of surgical site infection even for clean and clean-contaminated surgeries; antibiotics are usually given for 7-10 days. The traditional approach for this multi dose usage often leads to huge expenditure to the hospital and enhance emergence of resistance to the particular drug and the group to which it belong<sup>9</sup>. This study is thus intended to study the effect of single-dose antibiotic prophylaxis given 30 min prior to surgery with the standard chosen antibiotic versus the conventional use of the same antibiotic for 7 days.

### **Aims & Objectives:-**

- ✓ To compare proportion of early post-operative infection in clean surgeries after single dose of prophylactic antibiotic and multiple dose post-operative antibiotics.
- ✓ To assess cost-effectiveness of single dose antibiotic regimen versus conventional multi-dose regimen.

**Methodology:-**

This study was conducted as a prospective study in the Department of General Surgery in LG General Hospital, Maninagar from June 2016 to December 2017.

Totally 50 patients admitted for Laparoscopic Cholecystectomy in our hospital were included in this study. All the surgeries were carried out in the same operation theatre environment and same preoperative safety protocol, and post-operative care was followed for all patients

**Inclusion criteria:**

- Patients with no comorbid conditions and medically as well as anesthetically fit for surgery.

**Exclusion criteria:**

- Patient with co-morbid renal, cardiac, hepatic damages.
- Surgeries which had to be converted into Open Cholecystectomy.
- Surgeries in which any intra-operative complication was encountered.
- Patient on steroid or having immune deficiency.
- Non-willing patients

**Pre-operative preparation and care:**

All the patients posted for these elective surgeries were admitted on the day prior to surgery. All necessary investigations were done and anesthetic fitness obtained. The operative site was cleaned/shaved with aseptic precaution. All patients were asked to take body wash with soap on the day of surgery.

**Aseptic precautions in the operation theater:**

Asepsis is maintained, and checklists were verified. All the instruments were sterilized. Standard surgical scrub for 5-10 min was mandatorily followed by the surgical team

**Post-operative care:**

Temperature and vitals were monitored periodically, and the charts were maintained strictly. Wound inspection was done on 1<sup>st</sup>, 3<sup>rd</sup> and 7<sup>th</sup> day. All patients were followed up upto 7 days and ensured that antibiotics were given at appropriate time as per the protocol.

**Result:-**

Total 50 patients undergoing Laparoscopic Cholecystectomy for cholelithiasis were divided into two groups. Patients in the control group were given, 7 days of antibiotics. Study group patients got only one dose of prophylactic antibiotic 30 minute before surgery.

**Demographic profile:**

The mean age, weight, hemoglobin level, duration of surgery and duration of hospital stay for each group of patients were measured. The Demographic profile of all the patients in both the groups were studied and tabulated as follows

Sex	Study Group	Control Group
Male	8	6
Female	17	19
Total	25	25

Mean Age Range	Study Group	Control Group
<20 Years	1	1
20-30 Years	3	4
30-40 Years	8	7
40-50 Years	8	8
>50 Years	5	5

Demographic Profile	Study Group	Control Group
Mean Age	44.5 Years	46 Years
Mean Weight	74 kg	78 kg
Hemoglobin	12.5 g/dl	13 g/dl
Duration Of Surgery	1 hour & 10 mins	1 hour
Duration of Hospital Stay	1 and half days	3 days

**Antibiotic profile:**

The use of antibiotics were predetermined as follows



**Study group:**

- One dose of Inj. Ceftriaxone 1 g IV given 30 min prior to surgery and no more antibiotics were prescribed.
- 2<sup>nd</sup> day dressing changed and checked for infection on 3<sup>rd</sup>, 5<sup>th</sup> and 7<sup>th</sup> day.
- Suture removed on the 10<sup>th</sup> day.

**Control group:**

- In the post-operative ward for the first 3 days Inj. Ceftriaxone 1 g IV was given twice a day.
- For next 4 days Tablet Cefexime 200 mg was given twice a day.
- 2<sup>nd</sup> day dressing changed and checked for infection on 3<sup>rd</sup>, 5<sup>th</sup> and 7<sup>th</sup> day.
- Suture removed on the 10<sup>th</sup> day.

**Infection Grading:**

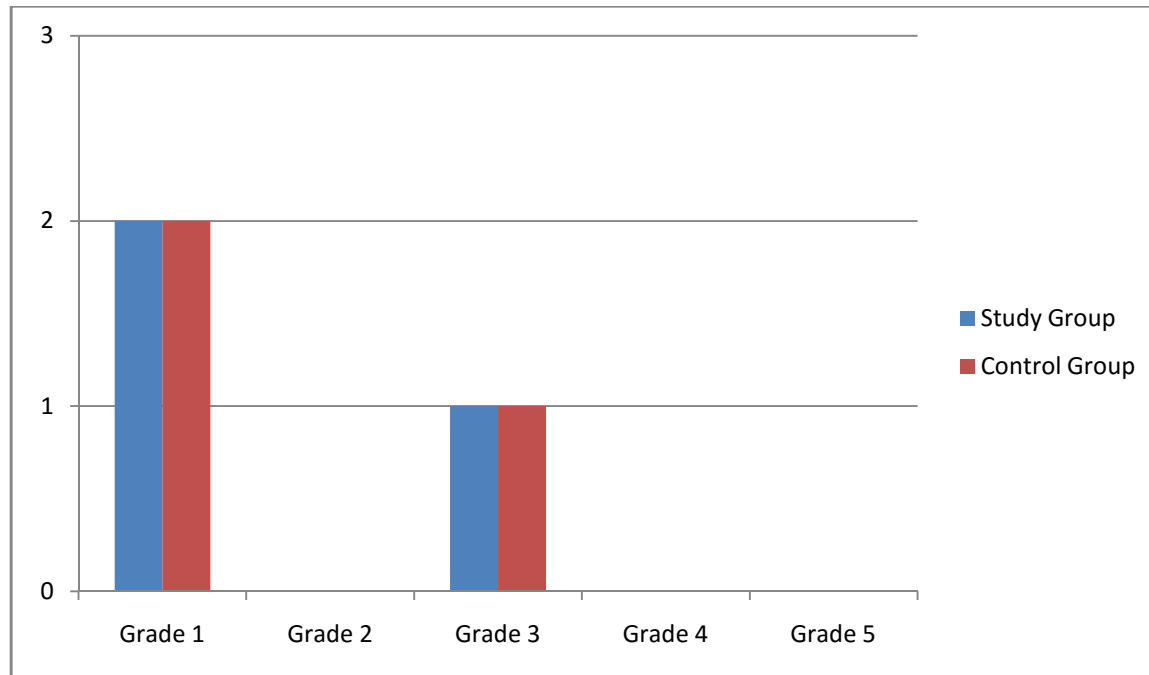
In the ward, based on the **Southampton scoring system** on the 3rd, 5th, and 7th post-operative period the wounds were inspected and the infection grades were documented.

Southampton scoring system	
Score	Condition of the wound
0	Normal Healing
1	Bruising and mild erythema
2	Erythema and signs of inflammation
3	Clear (or) serous discharge
4	Pus Formation
5	Deep, severe wound infection.

Out of the 50 patients, only 6 patients, 3 in each group developed infection in the post-operative period. No change in the management protocol was done. On appropriate local wound management, infections were controlled. No statistically significant difference with respect to infection prolife was noted in both the groups. The results are tabulated below.

Grade of Infection	Study Group			Control Group		
	3 <sup>rd</sup> Day	5 <sup>th</sup> Day	7 <sup>th</sup> Day	3 <sup>rd</sup> Day	5 <sup>th</sup> Day	7 <sup>th</sup> Day
Grade 1	1	1	-	-	2	-
Grade 2	-	-	-	-	-	-
Grade 3	1	-	-	-	1	-
Grade 4	-	-	-	-	-	-

<b>Grade 5</b>	-	-	-	-	-	-
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### **Side effects of antibiotic treatment:**

All patients were observed for the known side effects of the drugs used. None developed antibiotic side effects in the study group. However in control group, four patients had gastrointestinal symptoms i.e. nausea, vomiting and diarrhea.

### **Mean cost of antibiotics used:**

Mean cost of antibiotic was Rs. 65.80 in case group and Rs. 553.60 in control group, showing a cost reduction of 88.11%.

### **DISCUSSION:-**

Our study which was done to assess the effectiveness of a single dose of prophylactic antibiotic versus the traditional use of 7 days antibiotics has shown no significant difference in the wound infection rate in both the studied groups. However, there is a significant increase in the cost and side effects of antibiotics in the control group using conventional 7 days antibiotics.

The use of prophylactic antibiotic in all surgical cases are advocated ever since, the concept of use of antibiotic preoperatively to curtail and prevent wound infection was postulated by Bernard and Cole in 1964<sup>10</sup>.

With so much advancement in the strict asepsis of the environment and hygiene of the operation theatres which is being practiced widely, it was questioned in many surgical settings on the need of antibiotic at all for clean and clean-contaminated surgical cases. However, in high turnover hospitals especially in government run hospitals, even while all the sterile precautions are practiced, the surgical procedures can imbibe bacteria or other microbial agents in the blood and lead to bacteremia. Thus the use of long-acting antibiotic to cover the perioperative period is recommended<sup>11</sup>.

Several studies have been conducted on the choice of antibiotic and timing of use of antibiotics. Most of the studies have recommended the first dose to be given 30- 60 min prior to surgery, and long-acting antibiotic must be selected<sup>12</sup>.

Arjona F et al had conducted a study to find out the economic advantages following use of prophylactic antibiotic rather than traditional 7 days antibiotics, using 5260 patients in a medical Centre in Southern Taiwan and stated that use of prophylactic antibiotic alone for the surgical patients had resulted in gain of 1.5 million dollars for the public<sup>13</sup>. So, our study also concludes that, there is a significant advantage of economic gain when only prophylactic antibiotic is used.

Inadvertent and over use of antibiotics can cause side effects and also can lead to the development of drug resistance bacteria. In our study, it is also noted that a significant number of the patients had developed side effects of antibiotic during this period.

Along with prophylactic antibiotics, clean surgical environment, adequate hand washing, adequate preparation of patients and following universal precautions will improve the wound healing and prevent the infection in the patient<sup>14</sup>.

### **CONCLUSION:-**

Our study concludes that the judicious use of prophylactic antibiotic by itself can prevent any wound infections which will lead to potential economic benefits and prevent the development of resistant strains of bacteria. Hence, single dose prophylactic antibiotic will be effective in reducing postoperative infection if proper aseptic precautions during surgery are undertaken along with.

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## **AMBLYOPIA AND QUALITY OF LIFE**

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### **Abstract**

**Introduction:** Quality of Life is an important outcome measure in healthcare. Till today the Quality of Life of Indian amblyopic patient remains poorly understood, as there is no published study discussing them.

**Method:** A prospective cross sectional design of 91 amblyopic subjects between ages 3 to 12 years were conducted. Age and gender matched subject without any ocular pathology were taken as controls. The subjects underwent detailed clinical evaluation. Amblyopia and Strabismus Questionnaire was translated to Gujarati language and psychometric properties were analysed. The subjects completed the validated Gujarati questionnaire. The differences in Quality of Life among amblyopes and controls were examined, according to age, gender and clinical features.

**Result:** Amblyopia and Strabismus Questionnaire had an average content validity index was 0.86. The cronbach's alpha coefficient for internal consistent reliability was 0.733. The correlation coefficient analysis examining the test retest reliability was 0.914. The mean total score of Amblyopia and Strabismus Questionnaire was  $82.84 \pm 18.44$ . The mean score for amblyopic subjects were significantly lower ( $82.84$  vs  $97.69$ ;  $p < 0.05$ ) than controls. There were no statistical significant differences in the total score and individual domains in respect of age and gender. Amblyopic patients with strabismus scored lower in the scale of social contact and appearance in comparison to the non strabismic amblyopes ( $p < 0.05$ ).

**Conclusion:** The revised Gujarati version of the Amblyopia and Strabismus Questionnaire appears to be a valid and reliable questionnaire in clinical setting for Indian culture for Gujarati population. The amblyopes have a poorer Quality of Life.

**Key words:** Amblyopia, Quality of Life, Validity, Reliability, Psychometric property.

**Background:** Amblyopia is defined as a "a decrease of visual acuity in one eye when caused by abnormal binocular interaction or occurring in one or both eyes as a result of pattern vision deprivation during visual immaturity, for which no cause can be detected during the physical examination of the eye(s) and which in appropriate cases is reversible by therapeutic measures."<sup>1</sup> Quality of Life (QoL) is emerging as an important outcome measure for interventions designed to improve health, well-being, or both. Quality of Life differs across groups of patients as defined by disease, levels of severity, demographic features, socioeconomic status and cultural background. WHO defines quality of life (QoL) as an "individuals' perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns"<sup>5</sup>

Till today the Quality of Life of Indian amblyopic patient remains poorly understood, as there is no published study discussing them. There are few Quality of Life questionnaires which have been developed, demonstrating good psychometric property, but the questionnaires has not been translated and validated in any Indian languages. The present study aims to validate the Gujarati version of Amblyopia and Strabismus Questionnaire and to find out the Quality of life of paediatric amblyopes.

**Methodology:**

**Study design and Participants:** The investigation used a prospective cross sectional design to study the effect of amblyopia on Quality of Life. For assessment of Quality of Life the sample population was derived from Binocular vision and Orthoptic outpatient department of a tertiary eye hospital located in Western India.

The inclusion criteria for the study were as follows: 1) age between 3 and 12 years with monocular/ binocular amblyopia with or without strabismus 2) no ocular or facial abnormalities or eye disease except strabismus 3) visual acuity of better eye 6/12 or better for monocular amblyopia 4) visual acuity > 6/24 for binocular amblyopia 5) no previous history of surgery 6) not taking any anti-anxiety or anti-depressant medication. In addition, subjects who had participated in the pilot study or for the evaluation of psychometric properties of Gujarati version of the questionnaire were excluded to avoid familiarity with the questionnaire.

Age and gender matched subject were taken as controls. Subjects with any type of amblyopia, strabismus, ocular and systemic disorder, any reported psychological problem were excluded. All the subjects and controls were native of Gujarat and preferred Gujarati as the language of communication. All the clinical examination and guidance to children or parent for filling up the questionnaire, was performed by single investigator (researcher).

For assessment of Quality of Life of amblyopic subject, Amblyopia and Strabismus Questionnaire (A&SQ) was obtained from [www.retinafoundation.org/pdf/questionnaire.html](http://www.retinafoundation.org/pdf/questionnaire.html). The English version of A&SQ was translated to Gujarati following a standard forward backward translation procedure to develop the Gujarati version of A&SQ. Assessment of psychometric property of the Gujarati version of A&SQ was performed.

**Clinical Examination:** After detailed history taking, sensory evaluation was performed with Worth Four Dot Test for distance and near. Stereopsis was measured with Titmus test (fly, animals and circles). For measurement of visual acuity Log MAR visual acuity chart was used.

The angle of strabismus was measured by the simultaneous and alternating prism cover tests during fixation at distance (6 m) and at near (30 cm). Retinoscopy was performed with cycloplegia, followed by subjective refraction to obtain best corrected visual acuity. Accommodative response was evaluated using Monocular estimation method.

In the next stage Slit Lamp examination was performed for evaluating any anterior segment anomaly. Detailed fundus evaluation with binocular indirect ophthalmoscopy was done to rule out any posterior segment abnormality. Glasses with full correction were prescribed followed by adaptation period of one month. Occlusion hours were determined as per the norm of Pediatric Eye Disease Investigator Group.

**Data Collection and Analysis:** All data were analysed by SPSS statistical package (SPSS, Version 20.0; significance  $P \leq 0.05$  two tailed test). A value of  $p \leq 0.05$  was considered significant. The Kolmogorov – Smirnov test was used to examine the normal distribution of the data. Content validity index was used for determining item validity. Convergent validity of the questionnaire was performed by calculating the correlations between scores of each domain and total score. Discriminative validity was evaluated by comparison of the median score of amblyopes as that of normal subject using Mann –Whitney U test. . For reliability internal consistency was estimated by Cronbach’s alpha coefficient and test retest reliability was assessed by intra class correlation coefficient. The correlation ( $r$ ) between the clinical parameters and the five A&SQ domains was measured by the Pearson correlation test (two-tailed). The differences in Quality of Life among amblyopes and controls were examined, according to age, gender, clinical features, using independent sample t tests.

## Results:

**Psychometric properties:** The average content validity index was 0.86, indicating good content validity. The expert agreed that the questionnaire was culturally and conceptually adequate to measure the quality of life of amblyopic subject. AS&Q had low to moderate correlations between the score of each domain with  $r$  ranging from 0.146 to 0.509 ( $p < 0.05$ ), but had a high correlation between score of each domain with the total score, which ranged from  $r = 0.378$  to 0.802 ( $p < 0.01$ ) indicating adequate convergent validity (Table 1).

	Domain1	Domain2	Domain3	Domain4	Domain5	Total
Domain1	1	.509**	.422**	.446**	.197	.802**
Domain2	.509**	1	.146	.390**	.172	.378**
Domain3	.422**	.146	1	.417**	.221*	.120

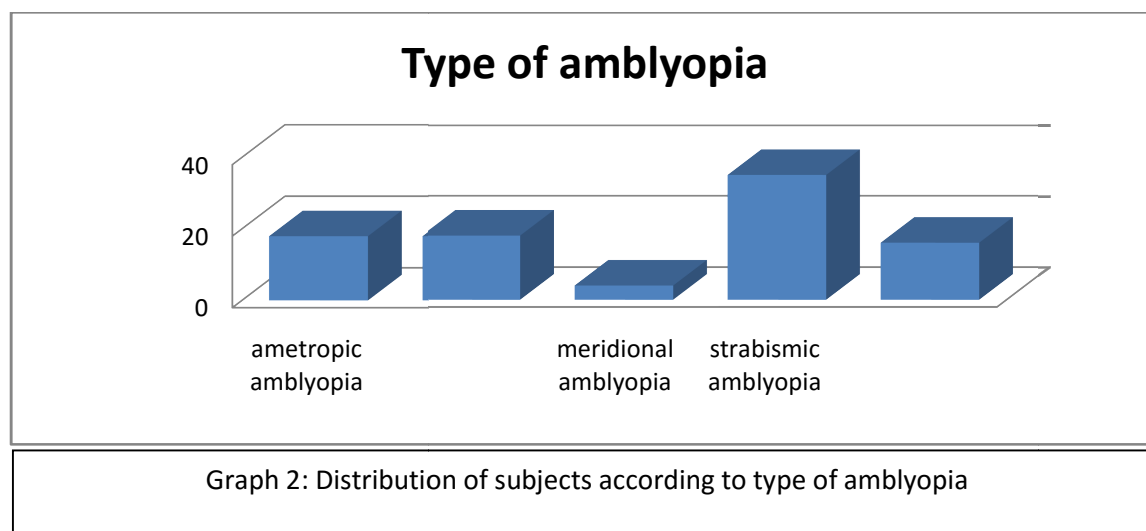
Domain4		.446**	.390**	.417**	1	.186	.628**
Domain5		.197	.172	.221*	.186	1	.639**
Total		.802**	.378**	.120	.628**	.639**	1

The cronbach's alpha coefficient for internal consistent reliability was 0.733, indicating good internal consistency or homogeneity; the values for all the domains ranged from 0.605 to 0.819. The correlation coefficient analysis examining the test retest reliability for a subset of amblyopic subject who filled up the questionnaire after 15 days interval was 0.914 for overall score and 0.763- 0.975 for the domain ( $p < 0.05$ )

Scale(items)	Test-retest reliability (n=20)	Internal consistency reliability(n=91)
Fear of losing better eye	0.975	0.696
Distance estimation	0.763	0.819
Visual disorientation	0.828	0.605
Double vision	0.924	0.803
Social contact and appearance	0.792	0.721
Total	0.914	0.733

Table 2: Reliability of A&SQ

**Participant Characteristics:** A total of 108 subjects diagnosed with amblyopia, which fulfilled the inclusion criteria were enrolled in the study. The entire questionnaire was returned, but 17 were incompletely completed, leaving a total sample size of 91 subjects. Distribution of patients according to type of amblyopia is shown in figure 1. All age and gender matched visually normal subjects, taken as controls, also returned the valid questionnaire.



**The AS&Q score on total and domains:** The mean total score of A&SQ was  $82.84 \pm 18.44$ . The mean score for amblyopic subjects were significantly lower ( $82.84$  vs  $97.69$ ;  $p < 0.05$ ) than



controls. The domain “fear of losing better eye” had lowest score while the domain “diplopia” had the highest score. There were no statistical significant differences in the total score and individual domains in respect of age and gender. Amblyopic patients with strabismus scored lower in the scale of social contact and appearance in comparison to the non strabismic amblyopes ( $p < 0.05$ ). No significant correlation was found with the visual acuity in better seeing eye and the total score.

QoL Score	Total	Domain1	Domain 2	Domain 3	Domain4	Domain 5
Male	83.62	79.55	84.77	82.43	86.27	85.09
Female	81.94	73.33	85.34	84.21	84.44	82.36
Age: 3-7 years	83.24	77.81	84.13	82.96	86.12	85.21
Age: 7-12 years	82.8	77.03	84.93	83.45	85.23	83.37
Strabismic Amblyopia	82.16	77.02	84.41	81.46	86.88	81.05*
Non strabismic Amblyopia	83.57	74.63	85.75	83.70	86.49	87.3*
Total	82.84	77.08	84.44	83.13	85.55	84.01
Domain 1: Fear of losing better eye, Domain 2: Distance estimation, Domain 3: Visual Disorientation, Domain 4: Diplopia, Domain 5: Social contact and appearance* $p < 0.05$						

**Discussion:** The original A&SQ was developed in Dutch language, an official language of Netherland, later on the questionnaire was validated for Chinese and Italian languages for use in Chinese and Italian population. According to the constitution of India there is no national language<sup>15</sup>. Although Hindi and English are used for official purpose, such as parliamentary or judiciary purpose, state within India have the power and liberty to specify their own official language<sup>16</sup>. Hence a questionnaire common to all Indian nationals, an Indian version, could not be developed. Since the study was performed on the subjects of the state of Gujarat, a Gujarati version of the questionnaire was developed. Further translated and validated version of A&SQ in various Indian languages of the state can yield an overall picture of QoL of amblyopes in India.

The A&SQ is the self-reported questionnaire. As all the subjects belonged to the paediatric age group, there was parental involvement while answering the questions. It is difficult to state that the impact of amblyopia felt by the child is same as that thought by the adult. The parent or guardian assessment of what child perceives can be questionable. Parents can judge the child response from some real like experience such as school work, exam results or peer

interactions. To overcome these difficulties parents were instructed to involve the children or to discuss with the child while answering the questionnaire. We cannot also over rule the fact that how difficult it is for the child between 3 to 7 years to fill up the questionnaire without parental involvement. Moreover subject between 7 to 12 years were also included to get more responses directly from the child and to negate the influences of parental judgement.

The overall analysis of the questionnaire showed that there was significant difference in overall scores in Quality of Life between amblyopes and controls. The findings are consistent with the findings of van de Graff et al<sup>17</sup>, Macron et al<sup>18</sup> and Bian et al<sup>19</sup>. In the domain “social contact and appearance” female scored slightly lower than males although the differences is not statistically significant. The concept of beauty is integrated with females in Gujarati society; the males are not far behind in consciousness of appearance in day to day life. Strabismic amblyopes scored lower than non strabismic amblyopes in the domain of “social contact and appearance”. The appearance of misaligned eye may cause a feeling of inferiority and negative social attitude in strabismic amblyopes compared with non strabismic amblyopes.

There was no significant correlation between age of the amblyope and the total score. This may be attributed to the paediatric age group of the patient. Also there was no significant correlation between the score and visual acuity as well as the severity of amblyopia.

The mean A&SQ score in amblyopes was 81.72 which is higher in comparison with the findings of van de Graff et al<sup>17</sup>, Macron et al<sup>18</sup> and Bian et al<sup>19</sup>. The differences in the score can be attributed to different population considered for the studies. There was variation in ethnicity, socio cultural life as well as the age of the population concerned. It may be hence assumed that the paediatric population with or without strabismus are less affected by their condition, which is reflected in the Quality of Life score.

**Conclusion:** To conclude, the revised Gujarati version of the A&SQ appears to be a valid and reliable questionnaire in clinical setting for Indian context especially for the state of Gujarat. QoL of amblyopic subject is poorer than controls. There is a significant difference in the QoL of amblyopes to that of controls. There is no difference in the overall QoL with age and gender. Lastly, the assessments of QOL through this questionnaire can be repeated at different times during therapy in order to monitor the changes in quality of life in the management of amblyopia.

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Original article

### **Epidural Bupivacaine 0.5% and Ropivacaine 0.75% in Lower Limb Orthopedic Procedures : a comparative study**

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## **Abstract**

**Background** Epidural blockade is one of the most useful and versatile procedures in modern anaesthesiology. Bupivacaine a long acting amide local anaesthetic though widely used but associated with side effects like neuro and cardio toxicity. Ropivacaine, developed as a possible alternative to Bupivacaine, has lower lipophilicity hence associated with a decreased potential for neuro and cardiac toxicity .

**Aims** Study was done to compare the haemodynamic variations , onset time and duration of sensory and motor block and complications if any of epidural anaesthesia produced by bupivacaine 0.5% and ropivacaine 0.75% in patients undergoing lower limb surgery.

**Methodology** 60 patients, aged between 18-65 years, ASA I and II, undergoing various lower limb surgeries were randomly allocated in 2 groups of 30 each. The time for loss of pinprick at T10, intensity of motor block, duration of sensory and motor block and hemodynamic changes were assessed for both the groups and compared .

**Results** The time of onset and duration of sensory block was comparable for both the drugs. Bupivacaine 0.5% produced more intensity and longer duration of motor block than ropivacaine 0.75% Both the drugs were comparable with respect to hemodynamic changes.

**Conclusions** Epidural ropivacaine 0.75% can be safely used as a possible alternative to bupivacaine 0.5% in lower limb orthopedic procedures.

**Keywords** : Epidural Anaesthesia; bupivacaine; Ropivacaine; lower limb surgeries;

## **Introduction**

Epidural blockade is becoming one of the most useful and versatile procedures in modern anesthesiology. It is more versatile than spinal anesthesia, giving the clinician the opportunity to provide anaesthesia and analgesia, as well as enabling chronic pain management. It provides better postoperative pain control and more rapid recovery from surgery. For orthopaedic surgery, the provision of pain relief enables early post operative mobilization, accelerates rehabilitation and return to normal function. . It also decreases intraoperative blood loss, perioperative ischaemic events, postoperative hypoxic episodes & venous thrombosis offering an excellent sensory block. <sup>1</sup> Bupivacaine is commercially available as a racemic mixture containing equal proportions of the S(-) and R(+) isomers. Despite its popularity, it is associated with a number of side effects like unwanted motor blockade, CNS and cardiotoxicity. There have been many reports of death attributable to bupivacaine induced cardiotoxicity after accidental intravenous injection. These cases resulted in the continued search for new and safer local anaesthetic agents.<sup>2</sup> Ropivacaine, a new long acting amide local anaesthetic was introduced as an answer to bupivacaine induced cardiotoxicity. Ropivacaine is developed as a pure S(-) enantiomer of propivacaine. It is less lipophilic than bupivacaine and is less likely to penetrate large myelinated motor fibres resulting in a relatively reduced motor blockade. This reduced lipophilicity is also associated with decreased potential for neuro and cardiotoxicity. Thus ropivacaine appears to be an important option for regional anaesthesia and for the management of post operative and labour pain.<sup>3</sup> The present study is designed to evaluate the time of onset and duration of sensory and motor blockade of ropivacaine 0.75% and bupivacaine 0.5% when administered epidurally for lower limb surgeries.

### **Material and method**

After approval from ethic committee, 90 patients between the age group 18-65 years of ASA I and II physical status, scheduled to undergo various lower limb orthopedic procedures under epidural anaesthesia with anticipated duration of surgery more than 1hr were included and randomly allocated into two groups of 30 patients each. A prospective double blind study was

conducted after taking an informed consent from the patients. Patients with a history of hypertension, diabetes, and liver disease, acute or chronic renal disease, known case of neurological disease, psychiatric disorders with anticipated difficult airway, neurosurgical and cardiovascular surgical cases and patients posted for emergency surgeries, patients with BMI  $>28 \text{ kg/m}^2$ , patients shorter than 150 cm, infection at the site of injection, with congenital anomalies of spine and patients with coagulation abnormalities, history of seizures and patients in shock were all excluded from the study. All patients included in the study were visited on the previous day of surgery and a detailed pre anaesthetic examination was carried out. An informed valid written consent was taken. Premedication with tablet lorazepam 2mg and ranitidine 150mg was given orally the night before surgery. Patients were asked to maintain nil per oral

status for at least 6 hours. In the operation theatre, baseline blood pressure and pulse was recorded. An 18 G IV cannula was inserted and all patients received 20 ml/kg of Ringers lactate solution to increase their circulating fluid volume before the epidural block. Patients were given left lateral position and under aseptic conditions skin was infiltrated with lignocaine 2% and 2 ml was given. Epidural space was located with 18 G Tuohy needle in L3-L4 space using the midline approach with loss of resistance technique and after negative aspiration for blood epidural space was located, 3ml of lignocaine test dose was administered to exclude intrathecal and intravascular placement of the needle. After 5 min period, the study drug was injected incrementally over 2 min and later patients were made supine. All assessments were made by an anaesthetist who did not know the drug used.

Measurement of blood pressure and pulse rate were recorded at 0,5,10,15,20 min and thereafter every 15min. Intraoperatively and postoperatively, complications like fall in blood pressure, variation in heart rate, respiratory rate and SpO<sub>2</sub> were noted. Sensory blockade using pinprick sensation was assessed until complete loss of sensation at T10 (taken as onset of sensory block) and then every 2 min to determine the time taken for maximum height of block

and there after every 15 min to determine the time for two segment regression and regression of sensory block at T12 taken as duration of sensory block. When sensory block reached T10 motor block was assessed using a modified bromage score. (Table 1) Thirty was the number in each group, where any results could be statistically significant hence this number was selected. Student T-Test was used to find out significance between samples. Data was reported as mean value  $\pm$ S.D. A P-value of  $< 0.05$  was considered statistically significant,  $<0.001$  as highly significant and  $> 0.05$  as not significant.

## Results

Score	Description
1	Complete block ( unable to move feet / knees)
2	Almost Complete block ( able to move feet only)
3	Partial block ( just able to move knees)
4	Detectable weakness of hip flexion while supine ( full flexion of knees)
5	No detectable weakness of hip flexion while supine
6	Able to perform partial knee bend

	Ropivacaine n=30	Bupivacaine n=30	Significance
Age (yrs)	30.2 $\pm$ 9.15	32.9 $\pm$ 9.43	ns
Height ( cm)	158.9 $\pm$ 3.6	160 $\pm$ 3.4	ns
Weight (kg)	56.73 $\pm$ 7.52	58.93 $\pm$ 8.22	ns
Sex ( male /female)	18/12	17/13	ns
Duration of surgery (min)	118.8 $\pm$ 23.6	114.7 $\pm$ 16.2	ns

	Ropivacaine	Bupivacaine	P value
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	n=30	n=30	
Onset of sensory block(min)	9.06 ± 3.82	8.76 ± 2.95	0.73 (ns)
Time for maximum height of sensory block (min)	15.76 ± 5.29	15.1 ± 5.43	0.63 (ns)
Time of two segment regression ( min)	100 ±13.34	102 ±13.87	0.48 (ns)
Time for regression of sensory blockto T12 (duration of sensory block )(min)	194 ± 17.93	190 ± 11.47	0.37 (ns)

**Table 4 : Maximum height of sensory block at segmental level : no o patients**

	Ropivacaine n=30	Bupivacaine n =30	P value
T <sub>5</sub>	-	1(3.33)	> 0.005
T <sub>6</sub>	13 (43.33%)	11 (36.66%)	
T <sub>7</sub>	8( 26.66 %)	6 (20 %)	
T <sub>8</sub>	9(30 %.)	12 (40 %)	

**Table 5: motor block**

	Ropivacaine n=30	Bupivacaine n=30	P value
Total duration of motor block (min)	130± 11.31	157 ± 12.09	< 0.001 (HS)
Modified Bromage grading of motor block	2.1	1.6	0.002 (s)

**Table 6: Incidence of complications- number of patients in each group**

	Ropivacaine	Bupivacaine
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Hypotension	1	3
Bradycardia	1	1
Nausea Vomiting	3	3

Demographic profile of three groups were similar regarding age , sex , height , duration of surgery (Table2) and ASA status of the patients. The mean time for onset of sensory block at  $T_{10}$  was  $9.06 \pm 3.82$  min for group R and  $8.7 \pm 2.95$  min for group B ( $p=0.72$ ). Time for regression of sensory block to  $T_{12}$ (duration of sensory block) was  $194 \pm 11.93$  min and  $190 \pm 11.30$  min for group R and group B respectively ( $p=0.37$ ) (table 3). In group R, 13 patients (43.33%) had a maximum height of sensory block up to  $T_6$ , 8 patients (26.66%) upto  $T_7$  and 9patients (30%) up to  $T_8$ . In group B, 11 patients (36.66%) had a maximum sensory block upto  $T_6$ , 6 patients (20%) up to  $T_7$  and 12 patients (40%) upto  $T_8$  and one patient (3.33%) upto  $T_5$  (table 4 ). Statistical analysis by chi squared test shows that the two groups are comparable ( $p>0.05$ ) Total duration of motor block was  $130 \pm 11.31$  min in group R and  $157 \pm 12.09$  min in group B( $p < 0.001$ ) When the sensory block reached  $T_{10}$ , the mean modified Bromage grade of motor block achieved in group R was 2.1 and in group B was 1.6( $p=0.002$ ) Statistical analysis using students unpaired t-test shows that this difference is statistically significant ( Table 5). Changes in heart rate, blood pressure and respiration were similar between the groups.

## DISCUSSION

Orthopedic surgeries are usually associated with perioperative pain which is a potent trigger for the stress response and autonomic system and is thought to be an indirect cause of various adverse effects like myocardial ischaemia, infarction, thromboembolic phenomena, impaired pulmonary function, ileus, fatigue, muscle catabolism, postoperative infection and postoperative confusional states. Epidural anaesthesia and analgesia is considered by many as the gold standard technique for major surgery. It has the potential to provide complete analgesia for as long as the epidural is continued. Epidural techniques are particularly effective at providing

dynamic analgesia, allowing the patient to mobilize and resume normal activities unlimited by pain. It also improves the postoperative outcome and attenuates the physiologic response to surgery, in particular, significant reduction in pulmonary infections, pulmonary embolism, ileus, acute renal failure and blood loss.<sup>4</sup>

Bupivacaine is an excellent drug for epidural anaesthesia, but its major disadvantage is its cardiotoxicity when used in high volumes required for epidural block. Ropivacaine is a long acting regional anaesthetic which has been developed for the purpose of reducing the potential toxicity associated with bupivacaine. It is developed as a pure S(-) enantiomer. R and S enantiomers of local anaesthetics have been demonstrated to have a different affinity for the different ion channels of sodium, potassium and calcium which results in a significant reduction of CNS and cardiac toxicity of the S(-) compared to R(+) enantiomers.<sup>3,5,6</sup> The present study included 60 patients of ASA I and II physical status aged between 18-65 yrs, undergoing various orthopedic procedures on the lower limb under epidural anaesthesia. The mean age incidences and sex distribution between the groups were comparable. The mean height, weight and duration of surgery were similar. We found that the onset of sensory block with ropivacaine and bupivacaine was comparable. Studies have shown that that there was no statistical difference in the onset of analgesia between the drugs.<sup>8,9</sup> We have used 15ml volume of both the drugs and our study demonstrated that in the ropivacaine group 43% patients had a maximum dermatomal level of sensory block to T<sub>6</sub> and 30% to T<sub>8</sub>. In the bupivacaine group 37% had a maximum height of block to T<sub>6</sub> and 40% to T<sub>8</sub>. Thus the maximum height of sensory block between the two groups was comparable when equal volumes were used. Similarly, A P Wolff et al<sup>8</sup> in their study found out that the maximum cephalad spread between the two groups was comparable. They had used 20ml volume of ropivacaine and bupivacaine and the maximum cephalad spread was T<sub>4</sub> with both the drugs.

Time for two segment regression was similar for both the drugs in our study. Wahedi et al<sup>9</sup> in their study also observed that the two segment regression time was  $140 \pm 60$  min for bupivacaine 0.5% and  $124 \pm 29$  min for ropivacaine 0.75% and were comparable. We found that our results are in contrast to the results obtained by Katz et al<sup>7</sup> who observed that the times to two segment regression were  $2.7 \pm 0.8$  hours with bupivacaine 0.5% and  $3.4 \pm 1.0$  hours with ropivacaine 0.75%, which was significantly longer than bupivacaine.

We have studied the duration of sensory block upto its regression to  $T_{12}$  and the duration of surgery was approximately 118min and mean time of regression of sensory block at  $T_{12}$  was 194 min the supplemental analgesia was given with injection tramadol 50 mg intravenously so that the patient doesn't have discomfort with the various orthopaedic positions used. The time for regression of sensory block to  $T_{12}$  was similar for both the drugs and we were unable to demonstrate any statistically significant difference between the groups. Studies by D P McGlade et al<sup>10</sup> and Katz et al<sup>7</sup> also have shown that time for regression of sensory block to  $T_{12}$  was similar for both the drugs

In our study, the mean modified Bromage grading of motor block was  $1.6 \pm 0.6$  with bupivacaine and  $2.1 \pm 0.7$  with ropivacaine when the sensory block reached  $T_{10}$ . As this difference was found to be statistically significant, bupivacaine group is said to have a higher intensity of motor block than ropivacaine. Ropivacaine is less lipophilic than bupivacaine and is less likely to penetrate the large myelinated motor fibres resulting in a relatively reduced motor blockade. Thus it has a greater degree of motor and sensory differentiation which is useful when motor blockade is undesirable.<sup>3,5,6</sup> Similar results have been reported in studies by Andrea Casati et al<sup>11</sup> and L M M Morrison et al.<sup>12</sup> This is in contrast to studies done by D P McGlade et al<sup>10</sup> and David L Brown et al<sup>13</sup> who failed to demonstrate a significant difference in the intensity of motor blockade between the two drugs. We have assessed the motor block when the sensory block reached  $T_{10}$  and then evaluated at the end of surgery only because of a possible interference with the

surgeon during the procedure. This may explain why some of the patients had an inadequate motor block before the surgery. No problems were reported by the surgeons during the procedure. The total duration of motor block was  $130 \pm 11.31$  min for ropivacaine and  $157 \pm 12.09$  min for bupivacaine. This difference was found to be statistically significant. Hence, ropivacaine has a shorter duration of motor block than bupivacaine. Our results are similar to a study done by David L Brown et al<sup>13</sup> where the duration of motor block with 20 ml of 0.5% ropivacaine was  $220 \pm 52$  min and 0.5% bupivacaine was  $276 \pm 52$  min which was longer. This is in contrast to D P McGlade et al<sup>10</sup> who failed to demonstrate a significant difference in the duration of motor blockade when 0.5% concentration of the drugs were used.

We observed that there was a fall in the systolic and diastolic blood pressure below the baseline after epidural administration at various intervals in both the groups. But this difference was not statistically significant ( $p > 0.05$ ). Two patients in group R and three patients in group B had clinically significant hypotension ( $SBP < 30\%$  baseline) which was corrected with IV mephentermine 6mg bolus. Pulse rate was assessed at various intervals after the administration of epidural anaesthesia and the change in mean pulse rate between the groups was not statistically significant ( $p > 0.05$ ). one patient in each group had bradycardia (heart rate  $< 60$ ) which was corrected with IV atropine 0.5mg bolus. There was no difference in the respiratory rate between the groups when measured at various intervals after administration of epidural anaesthesia. ( $p > 0.05$ ) Our results correlate with studies done by D P McGlade et al<sup>10</sup> and David L Brown et al<sup>13</sup> who also observed that there was no statistically significant difference between the groups with respect to hemodynamic changes.

## **CONCLUSIONS**

Results of this study demonstrate that there was no statistically significant difference in the onset and duration of sensory blockade between ropivacaine 0.75% and bupivacaine 0.5%. the cardiovascular changes ie the heart rate and blood pressure changes were similar between the

groups. Bupivacaine 0.5% produced more intense motor blockade of longer duration compared to ropivacaine 0.75%.

In conclusion, epidural ropivacaine 0.75% can be safely used as a possible alternative to bupivacaine 0.5% in lower limb orthopedic procedures.

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**Original article**

**Visual outcome in Methanol Poisoning: A study of an outbreak in Ahmedabad in July 2009**

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**Original article**

**VISUAL OUTCOME IN METHANOL POISONING A STUDY OF AN OUTBREAK IN AHMEDABAD IN JULY 2009 , Authors DR SHACHI PATEL\* DR REEMA RAVAL\*\***

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### **Abstract**

*This paper describes various aspects of presentation of methyl alcohol poisoning, especially ophthalmic and its correlation with visual outcome with different modalities of management. In the outbreak of methyl alcohol poisoning in Ahmedabad in July 2009, 138 patients admitted in Smt. Shardaben Hospital were selected for this study. Fifty seven of them presented with severe acidosis and visual impairment and lost their lives in spite of treatment. Twenty seven out of the 81 who survived had visual impairment. Thus total 84 (61%) patients out of 137 had visual impairment. Ophthalmic examination was done in all the 81 cases in detail. We found that the amount of alcohol consumed and acidosis had unfavourable impact on visual impairment as well as prognosis. Early correction of acidosis and early institution of hemodialysis had favourable visual prognosis.*

**Keywords:** methyl alcohol poisoning, acidosis, ocular manifestations, toxicology

### **Aims and objectives**

This is a retrospective study to evaluate the adverse effects of methanol on eye, to find out whether it has any correlation with age, the amount of consumption of methanol and blood pH level and to see the effect of hemodialysis on visual recovery.

### **Introduction**

Methyl alcohol, popularly known as wood alcohol, is a cheap and potent adulterant of liquors. It produces toxic metabolites in the body causing severe damage to the tissue even when consumed in small amounts. In a country like India, where poor people can only afford cheap alcohol, outbreaks of methyl alcohol poisoning are not infrequent. These outbreaks have been responsible for heavy toll of mortality and morbidity. Even 10 ml of methyl alcohol can cause severe retinal damage leading to permanent blindness.<sup>1</sup> Consumption of 100-125 ml is lethal. Effects of alcohol depends upon various

factors like amount of alcohol consumed, concentration of methyl alcohol in that liquor, rate of oxidation and rate of excretion in an individual. According to Henderson and Haggard<sup>2</sup>, it takes more than a week to eliminate the methyl alcohol acquired by a single large absorption. If there is a repeat exposure before methanol or formic acid is completely excreted, the effect is cumulative. A toxic concentration is thus gradually built up in the blood as a result of repeated exposure to concentrations that are otherwise not extremely toxic by themselves.

Sudden outbreak of methyl alcohol poisoning occurred in Ahmedabad in July 2009. In this, one of the worst outbreaks in Gujarat, 136 patients lost their lives and over 276 patients were treated at various hospitals. Most victims belonged to Majurgam, Odhav, Amraiwadi, Raipur and Rakhial areas of Ahmedabad city (The Times of India, 11<sup>th</sup> July, 2009).

This paper describes various aspects of presentation of methyl alcohol poisoning, especially ophthalmic and its correlation with visual outcome with different modalities of management.

### **Materials and methods**

A total of 138 patients with history of consumption of methyl alcohol were admitted to Smt. Shardaben Hospital and were examined by us. Fifty-seven patients presented with severe acidosis and visual loss lost their lives in spite of treatment. The remaining 81 cases were examined in detail and followed up daily for 4 days. Ophthalmic examination was done in all cases to check visual acuity, pupillary reaction and fundus with direct as well as indirect ophthalmoscopy. Visual acuity was checked with Snellen's chart; a two-line increase in the vision was considered as improvement in vision. Peribulbar Inj. Triamcinolone acetonide 40 mg was given in 80 cases in both the eyes immediately within an hour, while 1 patient refused for ophthalmic treatment as he had no ocular complaints. Three patients, not showing improvement with routine treatment, were given inj. Methyl prednisolone 1 gram in 250 ml of normal saline for 3 days followed by oral prednisolone 1mg/kg in tapering dose.

Blood samples of all patients were taken for hemogram, pH, S. Bicarbonate level, S. Methanol level, S. Ethanol level, S. electrolytes, arterial blood gas analysis (ABGA), Blood urea and S. Creatinine. All patients were given medical treatment by consulting physicians in form of I.V. infusion sodium bicarbonate to correct the acidosis, absolute ethyl alcohol, 0.9% saline and hemodialysis. Supportive treatment was given in form of folic acid (leucovorin) and injectable vitamin B1, B6 and B12. Forty patients with unstable vital signs, severe visual symptoms and severe acidosis not improving with the bicarbonate therapy were treated with hemodialysis.

### **Results**

Out of the 138 patients, 57 patients died (55 males and 2 female) and had severe visual loss. Out of remaining 81, 27 had visual complains. Thus 84 (61%) out of 138 patients had visual impairment. All 81 cases were males. Age of the patients ranged from 19 to 71 years with a mean age of 40.32 years. The



duration within which patients presented after consumption of alcohol ranged from 12 hours to 5 days. The amount of alcohol consumed ranged from 100 ml to 800 ml (mean = 363 ml). The exact concentration of methanol in the liquor was not known. One conservative estimate put it around 20 to 22 % which was responsible for higher mortality. The mean pH of the blood was 7.25 (range = 6.6 to 7.4) and mean S. bicarbonate was 13.83 mEq/L (range = 2.5 to 28.2) among 73 patients whose pH measurements were available. In initial vision assessment, 27 patients (33.3%) had vision 'Counting Fingers less than or equal to 1 meter' and was taken as visual impairment. Pupil was normal in size and reacting to light in 34 patients; sluggishly reacting in 28 patients; semi-dilated and fixed in 8 patients; and Marcus Gunn pupil in 11 patients. Ophthalmoscopic examination was normal in 34 patients; hyperemic disc in 30 patients; signs of papillitis in 9 patients; and disc pallor in 8 cases.

Out of 34 patients above 40 yrs of age, 12 (35%) had visual impairment and 6 of them (50%) showed improvement. Of the 47 patients below 40 yrs of age, 15 (32%) cases had complaint of visual impairment, of which 9 (60%) cases showed improvement after treatment.

Visual impairment was directly correlated to amount of alcohol consumed; 75% (3 out of 4) patients who had consumed >600 ml alcohol had visual impairment compared to 21% (3 out of 14) of patients who consumed less than 250 ml alcohol (see Figure 1a).

**Figure 1a. Correlation of amount of alcohol consumed and visual impairment**

The outcome of visual impairment was also correlated to the amount of alcohol consumed; out of 65 patients who consumed less than 400 ml of alcohol, 17 (26%) patients developed visual impairment; 11 of them (65%) showed improvement. Of the 16 patients who consumed more than 400 ml alcohol, 10 (63%) had visual impairment; 5 of them (50%) showed improvement after treatment (see Figure 1b).

**Figure 1b. Correlation of visual outcome and amount of alcohol consumed**

A direct correlation between visual impairment and acidosis was also found. Visual impairment was found in 67% (6 out of 9) patients with blood pH less than 7.1 as compared to 15% (5 out of 34) patients with pH between 7.3 and 7.4 (Figure 2a).

**Figure 2a. Correlation of Acidosis and visual impairment**

Patients with lesser acidosis at presentation had better visual outcome. Among 18 patients who had visual impairment with pH more than 7.1, 13 (72%) patients showed improvement after treatment. Of 6

patients with visual impairment and pH less than 7.1 only 2 (33%) showed improvement on treatment (Figure 2b).

### **Figure 2b. Correlation of Acidosis and Visual prognosis**

Hemodialysis was carried out in 18 out of 27 cases having visual impairment; 12 of them (67%) showed improvement. Of 9 patients with visual impairment at presentation who were not treated with hemodialysis, only 4 (44%) showed improvement (See Table 2).

### **Table 1. Correlation of Hemodialysis and Visual outcome**

All the three patients, who were given I.V. Methyl prednisolone, showed visual improvement.

## **Discussion**

Methyl alcohol poisoning is an acute medical emergency. To reduce the mortality and morbidity caused by the alcohol prompt and effective management is required. Concentration of methanol in the consumed alcohol is very important. Methyl alcohol in its pure form has higher toxicity. It has same metabolic process as ethyl alcohol so when it is consumed along with ethyl alcohol; inhibition of its metabolism is likely causing less toxicity.<sup>3</sup> In one outbreak in Bombay, 33 (70%) out of 47 patients had ocular changes.<sup>4</sup> In present outbreak out of 138 patients admitted in Smt. Shardaben hospital 84 (61%) had visual complaints.

Methyl alcohol is metabolized by alcohol dehydrogenase enzyme in formaldehyde, which is further broken down to formic acid which is responsible for its toxic effects. Formic acid is responsible for inhibition of normal metabolism in optic nerve cells.<sup>5,6</sup> Collection of the metabolites lead to acidosis which is responsible for damage to the ganglion cells of the retina. In our study out of 11 patients having severe acidosis (pH < 7.0), 5 showed signs of visual impairment (45%).

Symptoms appear as early as 12 hours of consumption of alcohol. Initial symptoms are of alcohol intoxication; later on symptoms of acidosis including visual disturbances appear. Characteristic visual changes include pupillary dilation and loss of pupillary reflex. Roe<sup>7</sup> observed normal optic fundi in majority of cases with occasional blurring of the disc margins and tortuosity of the vessels. He also found pallor of the disc and narrowing of the blood vessels within 6 to 12 weeks, the pallor preceding the narrowing of the vessels. Our observations also are similar.

Bicarbonate administration and haemodialysis are used to correct the systemic acidosis caused by accumulation of formic acid.<sup>8</sup> Prompt administration of ethanol and hemodialysis can cause complete reversal of symptoms of methyl alcohol poisoning.<sup>9</sup> Shukla M et al reported beneficial use of intravenous steroids in treatment of methanol induced blindness irrespective of time of presentation and degree of visual disability.<sup>10</sup> Peribulbar steroids were given to all our patients, however we could not find any

definite correlation of visual outcome and use of local steroids. Three patients, not showing improvement with routine treatment, were given inj. Methyl prednisolone 1 gram in 250ml of normal saline. All the three showed improvement.

Naraqi S. et al in their study of 28 cases in New Guinea had found that the estimated amount of consumed methanol and the rapidity of the appearance of signs of toxicity following methanol ingestion did not seem to influence the outcome of poisoning.<sup>11</sup> In another study of six cases of methanol poisoning in Baroda by Patel JK et al have found no relationship between the amount of liquor consumed and the eye involvement.<sup>12</sup> However we found a definite correlation between the amount of alcohol consumed and visual outcome.

Ravichandran RR et al observed good correlation between the ocular changes and the degree of acidosis in their series of 47 cases of Bombay outbreak in 1984.<sup>4</sup> Our observations are in accordance with earlier reported studies.

Ravichandran et al also found that visual improvement was more with the routine treatment of alkali and ethanol therapy compared to hemodialysis. One patient showed improvement out of 5 who were given dialysis and 30 patients showed good response to intensive alkali and ethanol therapy.<sup>4</sup> We however observed good visual prognosis in patients who were timely treated with alkali as well as hemodialysis. Eleven (64.7%) patients showed visual improvement out of 17 patients treated with hemodialysis.

## Conclusion

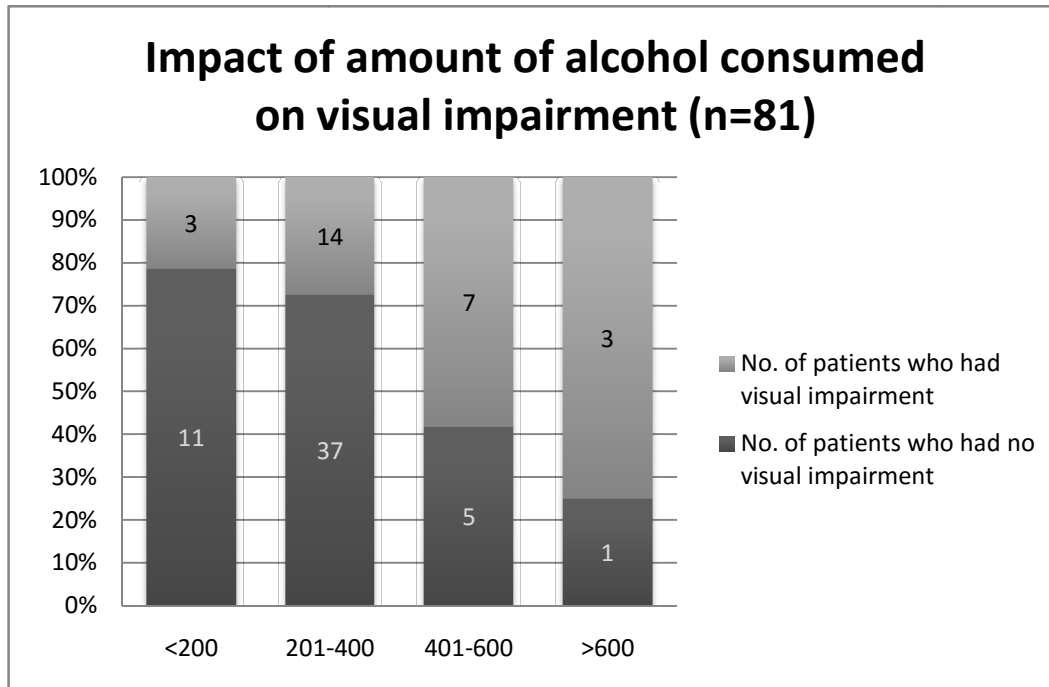
Ocular involvement in methyl alcohol poisoning is frequent and directly correlated to amount of alcohol consumed. Patients with heavy consumption, severe acidosis and loss of vision had higher mortality. In survivors, the amount of alcohol consumed and acidosis had unfavorable impact on visual impairment as well as prognosis. Early correction of acidosis and early institution of hemodialysis had favorable visual prognosis.

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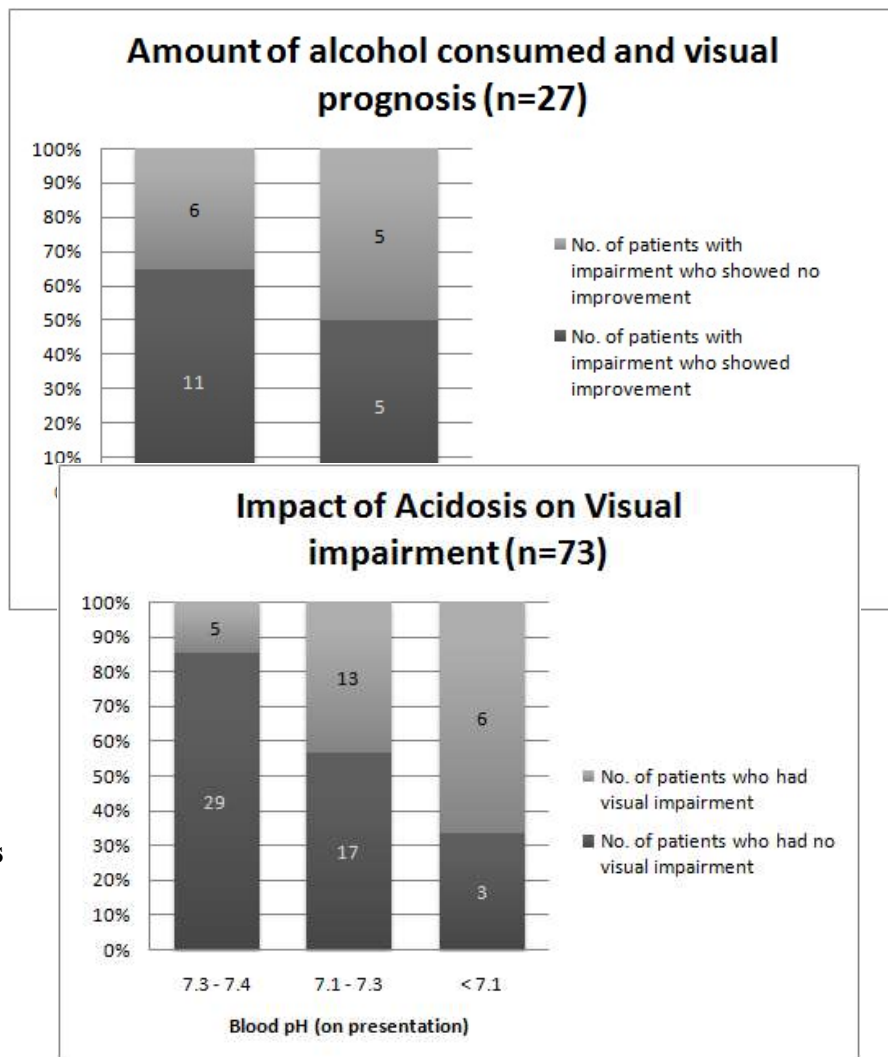
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**Figure 1a. Correlation of amount of alcohol consumed and visual impairment**



**Figure 1b. Correlation of visual outcome and amount of alcohol consumed**

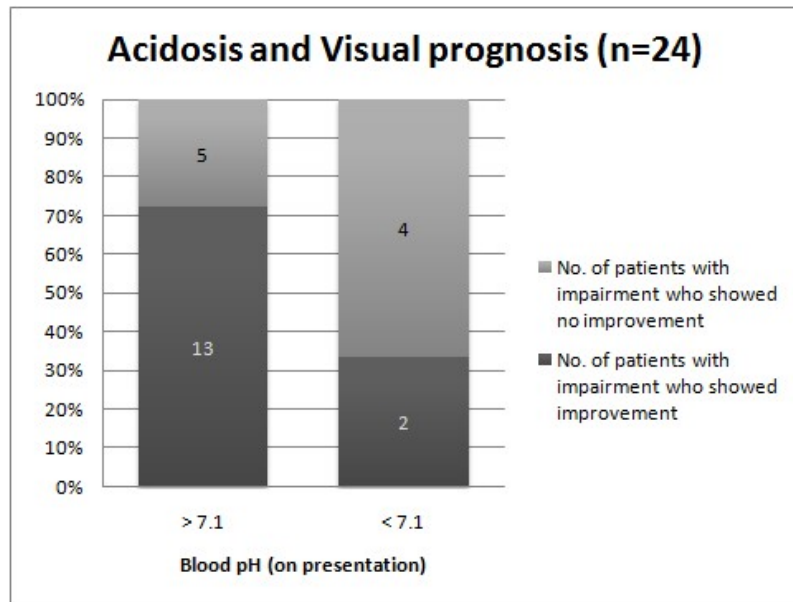


**Figure 2a. of Acidosis**

**Correlation and visual**

**impairment**

**Figure 2b. Correlation of Acidosis and Visual prognosis**



**Table 1. Correlation of Hemodialysis and Visual outcome**

Group	No. of patients	Showed improvement
Given dialysis	18	12
Not given dialysis	9	4

22

Original Article

**PREVALENCE OF VITAMIN D DEFICIENCY IN FEMALES OF HIGHER SOCIOECONOMIC CLASS OF AHMEDABAD, GUJARAT, INDIA**

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**ABSTRACT**

**Background:** Vitamin D is a group of fat-soluble secosteroids responsible for intestinal absorption of calcium &

phosphate-. Vitamin D is a major player in calcium homeostasis and bone metabolism. In humans, the most -important compounds of vitamin D are vitamin D<sub>2</sub> (ergocalciferol) and vitamin D<sub>3</sub> (cholecalciferol). Most of the vitamin D<sub>3</sub> is -synthesized in skin when it is exposed to ultraviolet B rays from sunlight. Vitamin D deficiency causes osteomalacia in adults and rickets in children. Deficiency of vitamin D results in impaired bone mineralization and bone damage, which leads to bone-softening diseases.

**Objective:** To find out the prevalence of vitamin D deficiency in females of higher socioeconomic population of Ahmedabad, Gujarat, India.

**Materials and Methods:** This is a cross-sectional study, carried out among the higher socioeconomic female population in Ahmedabad City, Gujarat, India. In this study, all the 300 subjects included were tested for serum 25(OH)D level by the electro-chemiluminescence immunoassay (ECLIA) method using an automated clinical chemistry analyzer (Elecsys 2010; Roche Diagnostics)

**Results:** In this study, majority (45%) of the subjects were severely deficient, while 39.67% were moderately deficient.

Hence, more than 80% of the subjects were moderate to severely deficient.

**Conclusion:** Serum vitamin D level estimation must be done in health-care management of skeletal disorders

and nutritional- review status. Serum 25(OH)D is the best measure of vitamin D exposure indicating both the effects of diet and sunlight. Severity of vitamin D deficiency also increases with the age.

**KEY WORDS:** Cholecalciferol, vitamin D<sub>3</sub>, 25(OH)D

## **INTRODUCTION:**

Vitamins are organic compounds that are required in minute quantities to sustain life. Vitamin D comprises a

group of fat-soluble secosteroids responsible for intestinal absorption of calcium and phosphate. Vitamin D was

long known to be a major player in calcium homeostasis and bone metabolism. Vitamin D was first discovered at the beginning of the 20th century as a missing nutrient in children with severe bone demineralization, a disease called rickets.

In humans, the most important related compounds of vitamin D are vitamin D<sub>2</sub> (ergocalciferol) and vitamin D<sub>3</sub>

(cholecalciferol).<sup>12</sup> Vitamin D<sub>2</sub> is synthesized by plants (mainly mushrooms and yeast), whereas vitamin D<sub>3</sub> is

synthesized in skin when it is exposed to ultraviolet B rays from sunlight or from artificial food source such as fatty fish, eggs, beef liver, and mushrooms. So, it is also called "sunshine vitamin."<sup>2</sup>

Vitamin D deficiency is common in females especially Muslim population in pregnancy. Vitamin D has been postulated to have a role not only calcium/phosphate homeostasis but in the prevention of cancer, autoimmune conditions, and



cardiovascular disease.<sup>3</sup> Deficiency of vitamin D results in impaired bone mineralization and bone damage, which leads to bone-softening diseases.<sup>4</sup> Individuals obtain vitamin D either through consuming vitamin D-rich foods (oily fish and dairy products) or through the skin's exposure to ultraviolet B radiation from sunlight.

This vitamin D, once it enters the body, is extracted by the liver and converted to calcidiol, which is also known as 25-hydroxy vitamin D [25(OH)D]. This 25(OH)D circulates in the blood stream and is the specific vitamin D metabolite, measurement of which in serum helps in determining a person's vitamin D status.<sup>5</sup> Kidneys convert some amount of calcidiol to calcitriol, which is the biologically active form of vitamin D and known as 1,25-dihydroxy vitamin D [1,25(OH)2D]. Calcitriol, circulating in the blood as a hormone, regulates the concentrations of calcium and phosphate in the bloodstream and promotes the healthy growth and

remodeling of bone. The best indicator of total body vitamin D storage is 25(OH)D because its half-life (2–3 weeks) is far greater than that of 1,25(OH)2

D (8–12 h).<sup>6</sup> The circulating concentration of 25(OH)D is in nanogram per milliliter, almost 1000-fold higher than the concentrations of 1,25(OH)2D. The 25(OH)D also stimulates the vitamin D receptors.

Apart from its bone health-specific use, vitamin D is also used in patients with cardiovascular disease,<sup>7,8</sup> multiple sclerosis,<sup>9</sup> pregnancy to prevent gestational diabetes, preeclampsia, and small infants,<sup>10</sup> tuberculosis,<sup>11</sup> HIV,<sup>12</sup> and deadly form of breast cancer.<sup>13</sup> Reduced

levels of vitamin D in blood are related to increased mortality,<sup>14</sup> and providing vitamin D3 as supplementary to elderly women in institutional care has been found to decrease the risk of death. An excess of vitamin D causes abnormally high blood concentrations of calcium (hypercalcemia), which can cause

overcalcification of the bones, soft tissues, heart, and kidneys. It can also damage the kidney and produce kidney stones. In addition, hypertension can result.<sup>15</sup> The symptoms of hypervitaminosis D appear several months after administration of overdoses of vitamin D, which are dehydration, vomiting, decreased appetite, irritability, constipation, fatigue, and muscle weakness. If the sunlight exposure is not adequate, then the

commonly recommended daily intake of vitamin D will not be suffice.<sup>16</sup> According to the United States Institute of Medicine,<sup>17</sup> the recommended daily dietary allowances of vitamin D are: up to 1 year, 400 IU; from 1 year to 70 years, 600 IU; and after 70 years, 800 IU (conversion: 1 µg = 40 IU and 0.025 µg = 1 IU)

## **MATERIALS AND METHOD**

This is a cross-sectional study, carried out among the higher socioeconomic populations of females in Ahmedabad City, Gujarat, India, during April 1, 2015, to September 30, 2016. In this study, all the 300 subjects who came for the estimation of 25(OH)D level have been included. Informed consent was obtained from all the subjects. The exclusion criteria include: (i) pregnant and lactating women and (ii) those who were taking vitamin supplements. Blood samples were collected from all the 300 subjects after overnight fasting and under aseptic pre-caution into plain vacutainers and labeled properly. After that, serum was separated and labeled properly. Then, the serum 25(OH)D level estimation was done by the electro-

chemiluminescence immunoassay (ECLIA) method using an automated clinical chemistry analyzer (Elecsys 2010; Roche Diagnostics).

Reference range for the serum 25(OH)D level recommended by Mayo Medical Laboratory is 29–80 ng/mL.<sup>18</sup>

Mayo Medical Laboratories<sup>18</sup> has categorized serum vitamin D level < 10 ng/mL as severe deficiency, between 10 and 28 ng/mL as mild to moderate deficiency, between 29 and 80 ng/mL as optimal levels, and >80 ng/mL as toxicity possible. But, in this study, we considered the serum 25(OH)D level greater than 30 ng/dL as adequate, between 21 and 28 ng/dL as mildly deficient, between 10 and 20 ng/dL as moderately deficient, and between 0 and 9 ng/dL as severely deficient.

## RESULTS

This cross-sectional study was carried out for period of 18 months, and a total of 300 patients were selected for serum 25(OH)D level estimation. Among these 300 female patients, 21 (7%) were having adequate level, 25 (8.3%) mild deficiency, 119 (39.7%) moderate deficiency, and 135 (45%) severe deficiency of vitamin D. From total 300 subjects, 28 (9.3%) were between 0 and 20 years, 76 (25.3%) 21 and 40 years, 107 (35.67%) 41 and

60 years, and 89 (29.6%) older than 60 years.

For severely deficient cases, of the total 135 cases, 4 (2.96%) subjects were aged between 0 and 20 years, 33 (24.44%) 21 and 40 years, 49 (36.3%) 41 and 60 years, and 49 (36.3%) older than 60 years.

## DISCUSSION

In this study 7% were having adequate level of vitamin D, 8.3% mild deficiency, 39.6% moderate deficiency, and 45% severe deficiency of vitamin D. In general, majority of the deficient subjects (35.6%) were aged between 41 and 60 years, which is followed by older than 60 years (29.6%). So, two-third of the subjects

was aged older than 40 years. The majority of the deficient subjects (45%) were severely deficient, which is

followed by moderately deficient subjects (39.6%). Hence, more than 85% of the subjects were moderate to severely deficient. Severity of deficiency also increases with the age.

In the study by Arya et al.<sup>19</sup> in 2004, of the total 92 subjects, 78.3% were having vitamin D deficiency. In the

study by Harinarayan et al.<sup>20</sup> in 2004, of the total 316 subjects, 69.3% were having vitamin D deficiency. In the study by Vupputuri et al.<sup>21</sup> in 2006, of the total 105 subjects, 94.3% were having vitamin D deficiency. In the study by Zargar et al.<sup>22</sup> in 2007, of the total 92 subjects, 83% were having vitamin D deficiency. In the study by Agarwal et al.<sup>23</sup> in 2013, of the total 200 subjects, 58% were having vitamin D deficiency. In this study, of the total 444 subjects, 93.3% were having vitamin D deficiency, which is closely similar to the

study by Vupputuri et al. and higher than the studies by Zargar et al. and Arya et al. In one of the study of 18 cities spread all over India done by Beloyartseva et al.<sup>24</sup> of the total 2,119 subjects, 79% were found deficient in vitamin D level.

### **Conclusion**

Vitamin D plays an important role in a wide range of physiologic functions. Serum vitamin D level estimation must be done in health-care management of skeletal disorders and nutritional review status of the population.

Serum 25(OH)D is the best measure of vitamin D exposure indicating both the effects of diet and sunlight. Persons with sun-avoidance behaviors were at higher risk for developing vitamin D deficiency. Vegetarian population has higher risk of vitamin D deficiency. Severity of vitamin D deficiency also increases with the age

### **Acknowledgments**

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**ABSTRACT: Introduction:** In chronic kidney disease (CKD) patients, left ventricular (LV) diastolic dysfunction occurs frequently and is associated with heart failure (HF) and higher mortality. Left ventricular systolic dysfunction is associated with coronary artery disease (CAD) and is a major determinant of prognosis. The aim of this study was to assess indices of LV diastolic dysfunction in CKD patients.

**Material and methods:** Study included 118 CKD patients. All patients underwent transthoracic echocardiography. Diastolic function based on E and A, E/A ratio and pulmonary vein flow velocities as well as EF%, deceleration time, RA, LA volume were assessed. In dialysis patients examination was carried out before and after dialysis.

**Observations:** In CKD patients the stage of renal failure was associated with the significant increase in LV mass, systolic LV & diastolic LV dimensions and in the size of the LA. The increase in the E/E' ratio between groups of patients was seen in this study. The reduction in deceleration time along with the decrease in estimated glomerular filtration rate was also observed in this study.

**Conclusions:** Early identification of factors involved is necessary to prevent this devastating process. Many indexes of contractility are used and each of them has imperfections. It seems that TVI, E, E/A ratio & E/E' ratio are good instruments for the early detection of left ventricular hypertrophy and diastolic dysfunction.

**KEYWORDS:** CKD, TTE, Diastolic dysfunction, systolic dysfunction.

#### **INTRODUCTION:**

Chronic kidney disease (CKD), which prevalence is still growing worldwide, confers a higher risk of coronary artery disease (CAD), chronic heart failure (CHF) and/or death independently of conventional cardiovascular risk factors [1–4]. In CKD patients, left ventricular (LV) diastolic dysfunction occurs frequently and is associated with heart failure (HF) and higher mortality [5]. Several studies have demonstrated that CKD severity was the most independent predictor of elevated LV filling pressure and could be responsible for impaired systolic and diastolic functions in pre-dialysis CKD [6]. Left ventricular diastolic dysfunction is observed even in patients with early stages of chronic kidney dysfunction [7]. It was estimated that 15% of patients starting dialysis therapy have systolic dysfunction of the left ventricle while the prevalence of diastolic dysfunction at dialysis inception is much higher. Either systolic or diastolic dysfunction can lead to clinically evident congestive heart failure [8]. Left ventricular systolic dysfunction is often associated with severe CAD and it is a major determinant of prognosis [9]. Left ventricular diastolic dysfunction in CKD patients is of complex nature. According to studies, it may be influenced by the increase in LV preload due to progression of CKD stage [10]. Also LV hypertrophy, CAD,

microvascular abnormalities, interstitial fibrosis, altered fluid and electrolyte metabolism and neurohumoral alterations might contribute to the development of LV diastolic dysfunction in patients with CKD [11]. Over-activation of the rennin–angiotensin–aldosterone system (RAAS) might play an important role in the pathomechanism since even a mild CKD results in early cardiac fibrosis with mild LV diastolic impairment and preserved systolic function [12].

Therefore the aim of this study was to assess LV echocardiographic indices in CKD patients including those on dialysis.

#### **MATERIAL AND METHODS:**

A cross-sectional analytical study of a population of 50 CKD patients was undertaken at Department of Internal Medicine, AMC MET MMC & LG Hospitals Ahmedabad. The IRB & Ethics committee of AMC MET approved this study. All patients signed informed consent form for TTE.

**Inclusion criteria:** Criteria for inclusion in the study was according to the criteria for the recognition KDOQI CKD and the recommendations of the ESC section of Echocardiography in 2009 on the recognition of diastolic dysfunction of the left ventricle.

#### **Exclusion criteria:**

State after kidney transplantation.

Haemoglobin < 8 g/dl.

Ongoing treatment for Malignancy or received treatment in past.

Active hepatitis B or C.

Repeatedly elevated blood levels of transaminases: alanine transaminase (ALT), aspartate transaminase (AST).

Other: HIV infection or other immune disorders, connective tissue diseases, therapy with immunosuppressive drugs, significant arrhythmias, indwelling cardiac pacemaker (CRT, ICD), h/o venous thrombosis or pulmonary embolism, hyperthyroidism and hypothyroidism, ejection fraction (EF) < 45%, hypertrophic cardiomyopathy, obesity.

All patients underwent transthoracic echocardiography (TTE). Echocardiographic examination was performed in accordance with the recommendations of the ESC section of Echocardiography of 2009. Measurements were made in the M-dimensional and two-dimensional 2D presentation. Flow parameters were evaluated using Doppler (continuous wave method – CW, pulse method- PM and tagged color method) and TDI. In the study, the following indices were assessed: size of the left atrium (LA), end-diastolic dimension of intraventricular septum (IVSd), left ventricle (LVIDd) and left ventricle posterior wall of the (PWd). The results of these measurements were used to evaluate LVEF (%) indicating LV systolic function and LVMI. The spectrum of mitral inflow was recorded using pulsed Doppler examination with Doppler gate placed at the end of mitral leaflets in apical 4-chamber view.

Diastolic dysfunction was assessed by determining the velocities of early (E) and late (A) diastolic transmitral flow, the ratio E-to-A (E/A), deceleration time (DT), isovolumic relaxation time (IVRT) and pulmonary vein flow velocities. Indices of LV diastolic function were analysed depending on the severity of CKD in the study groups.

Three basic types of diastolic dysfunction were distinguished:

1. Impaired relaxation: mild diastolic dysfunction (normal LV filling pressure at rest).
2. Pseudo-normalization: moderate diastolic dysfunction (mildly or moderately elevated LV filling pressure).
3. Restriction: severe diastolic dysfunction (significantly elevated LV filling pressure).

In dialysis patients examination was carried out before & after dialysis.

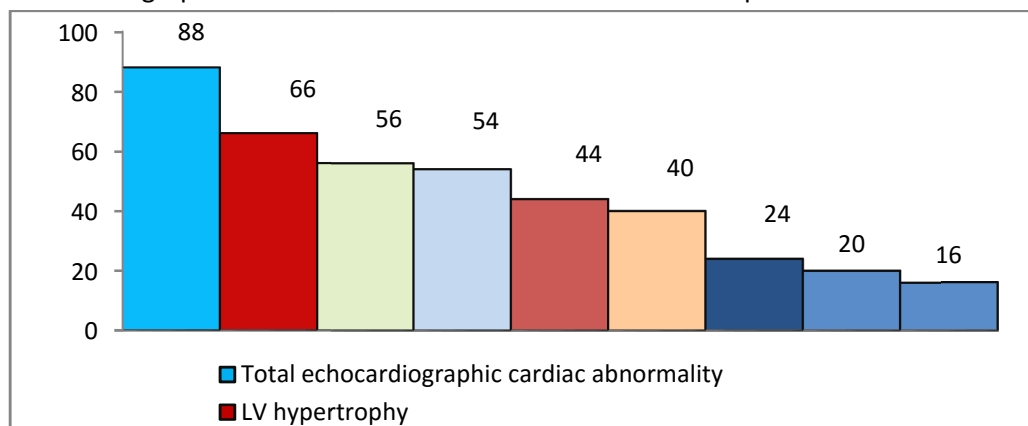
#### OBSERVATIONS:

1. Echocardiographic Parameters in patient of this study:

On TTE the mean values of observed parameters were found as follows,

Parameters	Mean $\pm$ SD
1. LVEF(%)	52.1 $\pm$ 13
2. Peak E(m/sec)	1.05 $\pm$ 0.48
3. Peak A (m/sec)	1.05 $\pm$ 0.51
4. E/A ratio	0.97 $\pm$ 0.4
5. LVIDd(cm)	4.88 $\pm$ 0.76
6. LV mass index(g/m <sup>2</sup> ):	
Male	145.5 $\pm$ 4.3
Female	123 $\pm$ 2.3
7. LVPWd(cm)	1.21 $\pm$ 0.20
8. IVSD(cm)	1.22 $\pm$ 0.21

2. Echocardiographic assessment of cardiac involvement In CKD patients:



3. LV systolic dysfunction in haemodialysis patients and patient on conservative treatment:



In our study, out of 50 patients of CKD, there are 36 patients on hemodialysis and 14 patients on conservative management. Out of 36 hemodialysed patients, 12 patients having systolic dysfunction and there is no systolic dysfunction in patient on conservative management. Thus, LV systolic dysfunction is common in patients on hemodialysis than those on conservative treatment. This correlates with S.Agarwal, P.Dangri, O.P.Kalrastydy. So, severe form of cardiac disease is more in ESRD.

4. **LV Dilatation in patient on haemodialysis & on conservative management:**

In our study, out of 50 patients of CKD, there were 36 patients on haemodialysis and 14 patients on conservative treatment. Out of 36 patients on haemodialysis, LV dilatation is present in 10 patients and there is no LV dilatation in patient on conservative management. So, LV dilatation is more common in patient on haemodialysis than on conservative management. This is compared with Mathenge RN study<sup>115</sup>. Thus, progression of cardiac disease is more in ESRD.

5. **Echocardiographically detectable pericardial effusion in symptomatic and asymptomatic patients of CKD:**

In our study, out of 22 asymptomatic patients (no cardiac symptoms), pericardial effusion is present in 10 (45%) patients & thus echocardiogram is a useful tool for early diagnosis of pericardial effusion before initiation of symptoms in uremic patient population. This is matched with Vaziri N.D. study, which also shows high prevalence of pericardial effusion in asymptomatic CKD patients<sup>58</sup>.

## **DISCUSSION:**

The analysis of echocardiographic parameters in this study showed that in CKD patients increasing stage of renal failure was associated with the significant increase in both systolic and diastolic left ventricular dimensions and in the size of the left atrium.

In more than half of the patients with formed arteriovenous fistula increased left ventricle end-diastolic dimension and worsening of diastolic function (shortening of deceleration time, E wave, the increase in E/A) were observed.

In agreement with Parfrey et al. study, it has been observed that shortly after the dialysis session, a reduction in diastolic diameter of the LV and an increase in the thickness of the LV wall occur which is associated with volume depletion by ultrafiltration (data not shown). Steady growth of interventricular septal thickness in end diastole and systole as well as the increase of LV muscle mass were observed in CKD patients along with the rising CKD stage. Left ventricular muscle mass was over 1.5-times higher in dialysis patients than in CKD stage II subjects. According to Zoccali et al. the increase in mass of 1 g/m<sup>2</sup>/month was associated with a 62% increase in the incident risk of fatal and non-fatal cardiovascular events in dialysis patients. They also suggested that changes in LV mass index represent a stronger predictor of mortality and cardiovascular complications than LV mass itself. Also Miyazato et al. [6] in their study of patients with chronic kidney disease noticed increased LV mass.

**CONCLUSIONS:** In conclusion, in CKD patients maladaptive events leading to LVH, structural changes myocardium as well as diastolic dysfunction and even systolic failure occur frequently. Thus, early

identification and treatment of factors involved in order to prevent this devastating process. Many indexes of contractility have been developed and each of them has imperfections. Now it seems that TVI and E, E/A ratio and E/E' parameters are good instruments for the early detection of LVH and diastolic dysfunction as they are important risk factors for cardiovascular morbidity and mortality in CKD. The limitation of this study is the fact that the number of subjects was relatively small and all patients came from a single centre and thus there is a possibility of bias in the selection process. Greater study group is needed to produce a more accurate representation of the prevalence of diastolic dysfunction in CKD. Moreover, our study population consisted of CKD patients with normal LV EF.

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#### A STUDY OF COMPARISON BETWEEN SILK LIGATION AND BIPOLAR CAUTERY IN TONSILLECTOMY

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## ABSTRACT

**Background:** Tonsillectomy is one of the most commonly performed surgical procedure. Different techniques and instruments have been used for removal of tonsils along with haemostasis but none of them were found satisfactory. The aim of this study is to assess and compare the relative efficacy of silk ligation and bipolar cautery coagulation techniques in controlling bleeding during tonsillectomy.

**Materials and Methods :** This prospective study was conducted at the department of ENT, M.P.Shah Government Medical College, Jamnagar. The study included 70 cases. All patients included were having history of recurrent, chronic tonsillitis, with more than 6-7 episodes in one year, 5 episodes in year for 2 years, or 3 episodes per year for three years. All surgeries were performed by conventional (dissection) method leaving behind the capsule intact. Results of the two groups i.e. tonsillectomy using silk ligation or bipolar cautery for haemostasis was studied.

**Results:** Tonsillectomy of 70 patients was performed; 39(55.71%) male and 31(44.29%) female. Bipolar cautery was used in 35 patients to achieve haemostasis while silk ligation in 35. The age of ranged from 3 to 30 years and above with the mean age of 23.33 years. Analgesia requirement in first 24 hours were equal in both groups.

Incidence of primary haemorrhage was noticed in 6(17.14%) cases when haemostasis was achieved with use of silk ligation and in 2(5.71%) cases when bipolar cautery used( due to loosening of knot and rise of blood pressure after the effect of anaesthesia wears off and due to post-operative reactionary oedema). Incidence of secondary haemorrhage was nil after tonsillectomy with use of both bipolar cautery and silk ligation. In our study, bipolar cautery was better than silk ligation in post-operative haemorrhage.

**Conclusion:** chances of secondary haemorrhage were equal but primary haemorrhage was significantly less in bipolar cautery.

## INTRODUCTION

Tonsillectomy is one of the most commonly performed surgical procedures particularly in paediatric age group with varying popularity over the world. Celsus and Paulus Aegineta described tonsillectomy in literature in 1000BC<sup>1,2</sup>. Aulus Cornelius Celsus(25-50AD) described a procedure whereby using the finger to separate the tonsils from the neighbouring tissue before they were cut out. Galen (121-200AD) was the first to advocate the use of surgical instrument known as the snare. In the 7<sup>th</sup> century Paulus Aegineta(625-690AD) described a detailed procedure for tonsillectomy, including dealing with the inevitable post-operative bleeding. The Greeks called the tonsils indurated and inflamed antiades. They were loosened by scraping around them and then torn out; alternatively they were picked up with little hook and excised with a scalpel. After that the fossae were washed out with vinegar and painted with a medication to reduce bleeding<sup>3</sup>. Scottish physician Peter Lower in 1600 AD introduced the cold steel technique including the sanre,the ligature and the excision. The operations become popular in nineteenth century after the invention of "tonsillotome"by Guillotine<sup>4</sup>. Different techniques and instruments have been used for removal of tonsils along with haemostasis but none of them were found

satisfactory. Modern methodologies like, use of harmonic scalpel, bipolar scissor dissection, microdebrider endoscopic tonsillectomy and laser tonsillectomy techniques has revolutionized the surgery of tonsillectomy<sup>5</sup>. These new ways are considered to reduce the size of the tonsils, to decrease the time period, to minimise and prompt control of bleeding during surgery and to decrease post-operative pain and to resume his or her normal day-to-day activities<sup>6</sup>. American Academy of Otolaryngology-Head and Neck Surgery (AAO-HNS) recommends that children who have three or more tonsillar infections a year that result in significant loss of school or work and some associated with chronic suppurative otitis media and cervical lymphadenopathy while the young adult patients with repeated attacks (3-4 per year for 2-3 year) of acute tonsillitis or a sleep disorder should be a candidate for removal of enlarged tonsils<sup>7</sup>. Today the dissection method is still preferred for the removal of enlarged or recurrent infected tonsils in spite of various modern methods and surgical instruments and is usually safe and simple<sup>8</sup>. It is important to find the proper plane of dissection to avoid excessive bleeding. It has been regarded as a major surgery because of its known post-operative haemorrhage and complications due to anaesthesia. With the advent of different technologies like electro-cautery tonsillectomy, microdebrider endoscopic tonsillectomy, tonsillectomy by harmonic scalpel, laser tonsillectomy and coblation tonsillectomy, it has been possible to reduce the size of tonsil and effective haemostasis. However, their cost and availability limit their use. In spite of all new surgical tools and techniques, haemorrhage is still a significant complication during and after tonsillectomy and about 5% patients may face this problem at any time from first 24 hours to 10 days after operation<sup>10</sup>. Primary haemorrhage occurring <24 hours after tonsillectomy remains the most serious complication of surgery. Today the modern methods for tonsillectomy has turned this operation as an outpatient procedure in many centers at UK and USA but still debate is going on for control of haemorrhage<sup>9</sup>. Haemorrhage due to tonsillectomy has been classified according to the time i.e. primary haemorrhage which occurs during the first 24 hours of surgery and secondary haemorrhage occurs after 24 hours of surgery<sup>13,14</sup>.

Bipolar cautery and silk ligation are the two common means for controlling haemorrhage during and after tonsillectomy with variable results.

With use of bipolar cautery the area of tissue ligation is localized between the fine tips of cautery forceps causing less tissue necrosis in a more controlled and precise fashion resulting in less post-operative bleeding but there is always a danger of necrosis and infected slough formation which may lead to secondary haemorrhage<sup>17,18</sup>. Secondary haemorrhage in silk ligation due to loosening of knot and ligation while straining during coughing or vomiting and post-operative oedema.

The aim of this study was to compare the morbidity and determine the efficacy of bleeding control during tonsillectomy using two different methods of haemostasis during surgery i.e. silk ligation versus bipolar cautery.

## **MATERIALS AND METHODS**

It was a prospective and comparative study conducted in ENT Department of M.P.Shah Medical College, Jamnagar between July 2011 –September 2013, where 70 patients gathered from the out patient department.

Tonsillectomies in all cases were performed according to the criteria approved by the American Academy of Otolaryngology-Head and Neck Surgery(AAO-HNS).

**Inclusion criteria:** chronic and recurrent tonsillitis, too big tonsils with blockage of throat, peritonsillar abscess, sleep apnoea and unusual enlargement of tonsils between age group of 3 to 30 years and more.

**Exclusion criteria:** with bleeding tendency, recent episode of acute tonsillitis, metastatic malignancies, eagles syndrome, co-existing upper or lower respiratory tract infection, contraindications to anaesthesia, uncontrolled medical illness, anaemia and patients underwent adenotonsillectomy.

Informed consent was taken in all cases regarding the surgical procedure and inclusion in the study. A detailed history was taken. All the patients were admitted to the ward and investigated to determine their fitness for general anaesthesia and surgery. Clinical examination, socio-economical class evaluation and laboratory investigation like complete blood picture, bleeding and clotting time, prothrombin time, platelets count, urine analysis, chest x-ray and ECG were done.

All operations were performed by the same surgeon under general anaesthesia using the dissection method leaving behind the capsule intact. Bleeding points were immediately clamped and ligated. The tonsillar fauces were packed with cotton taken from the measured pad. Once the tonsils were snared off, they were squeezed thoroughly into the gauze(which was again taken from the measured pad) and the tonsils discarded. Patients were assigned on alternate basis into two categories with respect to mode of haemostasis; by bipolar cautery in 35 patients(50% of cases) and silk ligation in the other 35 patients(50%). Suture ligation was carried out with silk 1 and cautery with use of bipolar cautery on coagulation setting. Complete haemostasis was achieved in both the groups. All cases were kept for observation in the recovery room for any immediate post-operative bleeding. Vital signs were monitored every 15 minutes in the recovery room and half hourly for the first two hours and then two hourly for the first 8 hours in the ward. The patients were shifted to the ward after complete recovery from general anaesthesia. Any excessive bleeding from the corner of mouth, difficulty in breathing, nausea and vomiting noted and recorded on the chart. Monitoring of vital signs; pulse rate, blood pressure, respiratory rate during next 24 hours for all patients was done. Blood stained saliva in the absence of rapid collection of blood for first 12 hours was taken as normal. The frequency of haemorrhage in the first 24 hours was compared in the two groups.

## RESULTS

A total of 70 cases were selected for the tonsillectomy.

We used bipolar cautery in 35 cases and silk in 35 cases to achieve haemostasis during the surgery.

Intra-operative inj.dynapar was given to all patients .Analgesics required in the first 24 hours were almost equal in both the group with no significant difference.

Primary haemorrhage was noticed in 2(5.71%) cases when haemostasis was achieved using bipolar cautery and in 6(17.14%) cases when silk ligation was used to control the bleeding during tonsillectomy (Table-4).

Not a single case noted for secondary haemorrhage.

**Table-1:** GENDER DISTRIBUTION OF PATIENTS FOR TONSILLECTOMY (n=70)

Gender	No. Of patients	Percentage (%)
Male	39	55.71
Female	31	44.29

39(55.71%) male and 31(44.29%) female, indicating slightly higher incidence in the male population (Table-1).

**Table-2** AGE DISTRIBUTION OF PATIENTS IN OUR STUDY (n=70)

Age group( in years)	Total no of cases	Percentage (%)
3 to 10	13	18.57
11 to 20	42	60
Above 21	15	21.42

The distribution of patients among different age group was, 13 cases belonging to 5 to 10 years, 42 cases 11 to 20 years and 15 cases were 21 above(Table-2).

**Table-3** INDICATIONS OF TONSILLECTOMY IN OUR SERIES (n=70)

Sr no.	Disease	No of patients	Percentage of patients
1	Chronic tonsillitis	55	78.57
2	Chronic suppurative otitis media	9	12.85
3	Bilateral cervical lymphadenopathy	5	7.14
4	Obstructive sleep apnoea	1	1.42

In this study 55(78.57%) cases were having recurrent episodes of tonsillitis for last 2 to 3 years,9(12.85%) cases were associated with chronic suppurative otitis media, in 5(7.14%) cases were

persistent cervical lymphadenopathy not responding to medical treatment with tonsillitis as the cause, 1(1.42%) case was associated with obstructive sleep apnoea (Table-3).

**Table-4** POSTOPERATIVE HEMORRHAGE (n=70)

Sr no.	Method of haemostasis	Primary haemorrhage	Secondary haemorrhage
1	Bipolar cautery	2 (5.71%)	0(0%)
2	Silk ligation	6(17.14%)	0(0%)

Primary haemorrhage was noticed in 2(5.71%) cases when haemostasis was achieved using bipolar cautery and in 6(17.14%) cases when silk ligation was used to control the bleeding during tonsillectomy. Not a single case noted for secondary haemorrhage (Table-4).

## DISCUSSION

Post-tonsillectomy haemorrhage remains the most serious and even fatal complication of tonsillectomy. Haemostasis is usually secured by ligating the bleeders or coagulating them by cautery or by a combination of both of them. Primary haemorrhage is generally considered to be related to surgical technique whereas factors that influence wound healing contribute to secondary haemorrhage.

In our study a total of 70 cases were selected for tonsillectomy; 55.71% males and 44.29% females, indicating a higher incidence in the male population due to increased preponderance for treatment in our male dominating society.

In our study the analgesics required in the first 24 hours were almost equal in both groups with no significant difference. This is similar to other studies comparing electro-dissection to the conventional technique<sup>12</sup>.

Primary haemorrhage was noticed in our study in 5.71% cases where haemostasis was achieved using bipolar cautery and in 17.14% cases when silk ligation used to control the bleeding during operation. Adel Sahib AL study in a retrospective study found post-operative bleeding in 7.2% of patients who underwent bipolar cautery as compared to 5.8% of patients with silk ligation. Secondary haemorrhage noticed in our study was 0.0% case. Adel Sahib AL study found secondary haemorrhages in 4.1% with silk ligation and 4.8% with used of bipolar cautery<sup>17</sup>.

## CONCLUSION

Primary haemorrhage occurring during tonsillectomy is a serious threat and control of bleeding during the procedure should therefore be meticulous. Chances of primary haemorrhage was less in bipolar cautery as compared to silk ligation. Chances secondary haemorrhage was nil in both methods. Our study has shown that bipolar cautery is a better method of haemorrhage control as compared to tying of silk ligatures.

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**EPIDEMIOLOGY OF TIBIA FRACTURES: A 6-MONTH STUDY IN A MAJOR ORTHOPEDIC HOSPITAL**

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**Abstract:**

Aims and Objective:

1. Collect data of tibia fractures at VS General Hospital.
2. Demographic distribution of tibia fracture.
3. Correlate and elaborate various aspects like cause and management.

**Background:**

Epidemiologic differences in the site and type of fractures within different populations arise due to inherent differences in the populations, their culture practices and lifestyles.

Through this study, we aim to provide data that may help to update the demographic information of patients that are diagnosed with tibial fractures in terms of the frequency of such injuries, mechanism of injury, fracture patterns and sites and the surgical procedure involved in their care.

**Materials And Methods:**

This study is designed as a retrospective observational study of 100 patients who were diagnosed with tibial fractures between February and July, 2017.

**Results:**

Most of our patients were young male adults, with ages between 21 and 40 years.

RTA was the most common cause of fracture.

Evening was the most common time of the day followed by afternoon, during which patients were brought in.

Isolated fractures were more common than polytrauma.

Maximum patients had fracture in midshaft region of closed variety and were managed operatively.

**Inference And Conclusion:**

Tibia fracture is most common in young male patients who are more involved in motor vehicle activities. There seem to be a major dominance of RTA at evening which appears to have increased traffic activity.

**BACKGROUND**

Epidemiologic differences in the site and type of fractures within different populations arise due to inherent differences in the populations, their culture practices and lifestyles. We have chosen to focus on a relatively less studied fracture, the tibial fracture. With the rapid pace at which

countries are developing, road traffic accidents (RTAs) are beginning to account for a major share in significant morbidity and mortality. This is compounded by the fact that in developing countries like India, RTAs are usually poorly documented and fatalities remain under-reported. This study was designed to provide an update on various aspects of tibial fractures that were brought to the Vadilal Sarabhai General Hospital, Ahmedabad, between February and July, 2017. Through this study, we aim to provide data that may help to update the demographic information of patients that are diagnosed with tibial fractures in terms of the frequency of such injuries, mechanism of injury, fracture patterns and sites and the surgical procedure involved in their care.

### **MATERIALS AND METHODS**

This study is designed as a retrospective observational study of 100 patients who were diagnosed with tibial fractures between February and July, 2017. Patient charts were reviewed and data was collected for gender, age and details of the fracture like the cause, site, type and pattern, operative procedure, follow-up care, complications and other relevant clinical data.

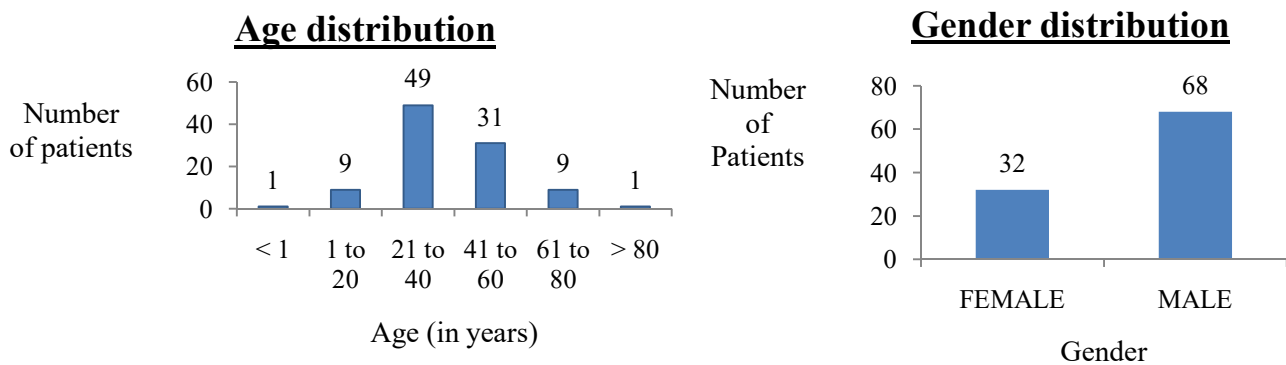


**VARIOUS TYPE OF TIBIA FRACTURES:-**

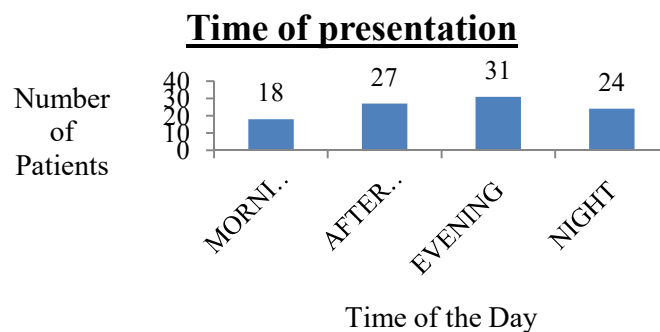


## **RESULTS AND DISCUSSION**

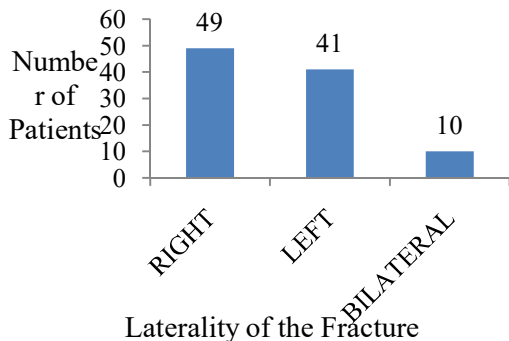
We collected data of 100 patients (32 female, 68 male). The mean age of our patients was  $37.64 \pm 16.96$  years. The median age was 35 years. Most of our patients were young adults, with ages between 21 and 40 years. One of our patients was 8 months old, while one was 85 years of age. This was also seen in the study carried out by Elsoe *et al*<sup>1</sup> in 2015



Evening was the most common time of the day followed by afternoon, during which patients were brought in. 31 patients came in the evening while 27 came in the afternoon

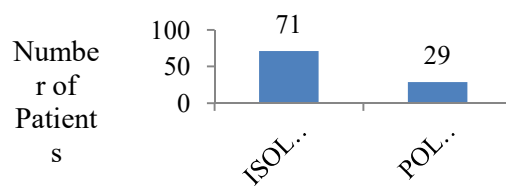


**Laterality of the fracture**



Isolated fractures were more common than polytrauma (71 compared to 29), with right tibial fractures (49) being almost as favored as left (41). Bilateral fractures were seen in 10 patients.

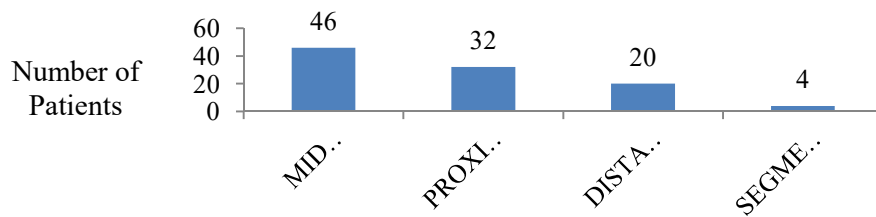
**Type of injury**



Type of Injury

46 fractures occurred in the mid shaft region, 32 in the proximal shaft. This has also been observed by Grecco *et al*<sup>2</sup>. Two of the segmental fractures were associated with bilateral tibial fractures- one mid shaft fracture and one distal shaft fracture, which have been included in their respective categories

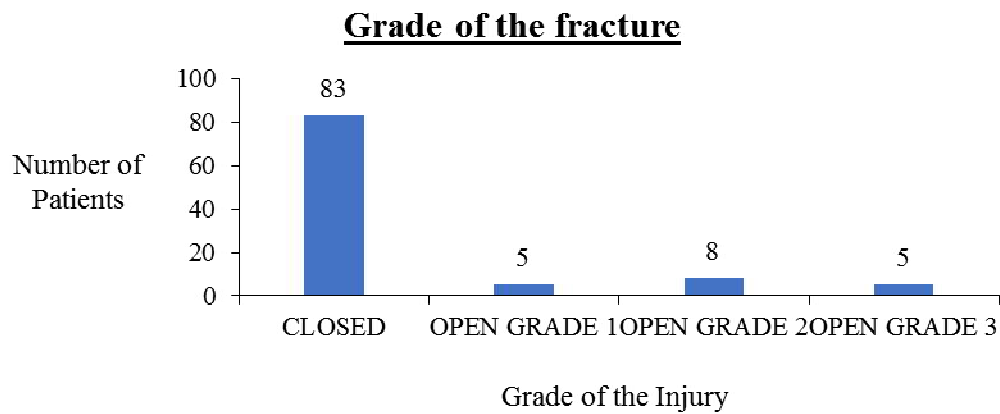
**Level of the fracture**



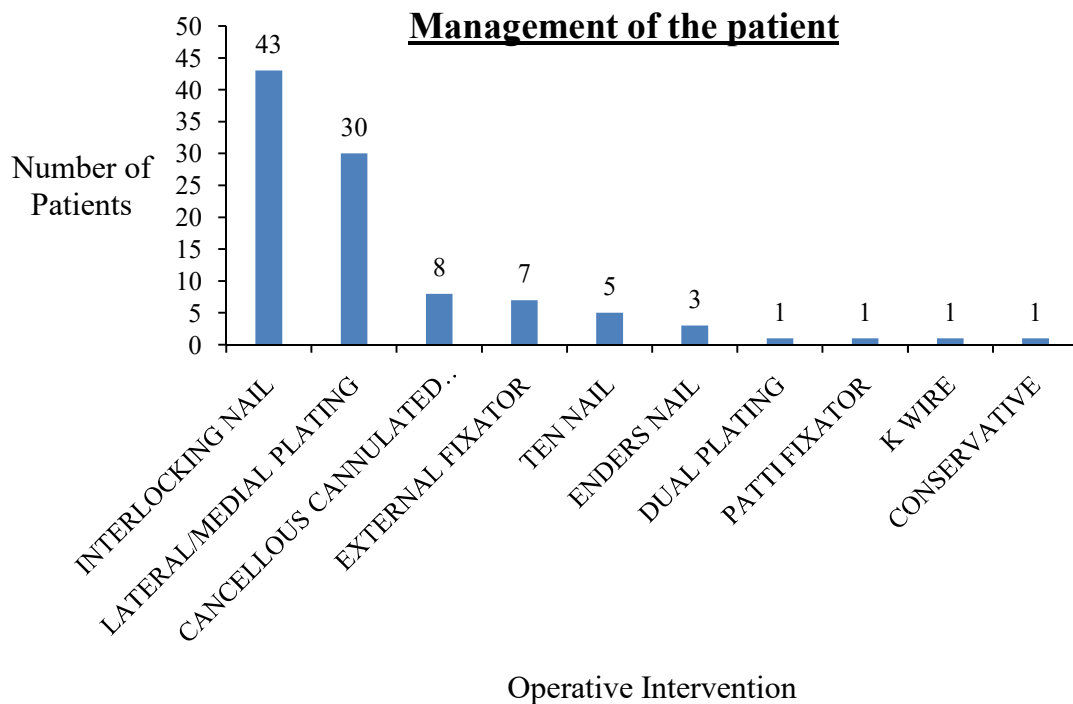
Level of the Injury

We saw mostly closed fractures (83), while out of the remaining open fractures, grade 2 fractures were the most common ones. (including one bilateral fracture in which one limb had

closed fracture while the opposite limb had open grade 2 fracture, which has been included in both categories), as also seen in the study conducted by Grecco *et al*<sup>2</sup>.

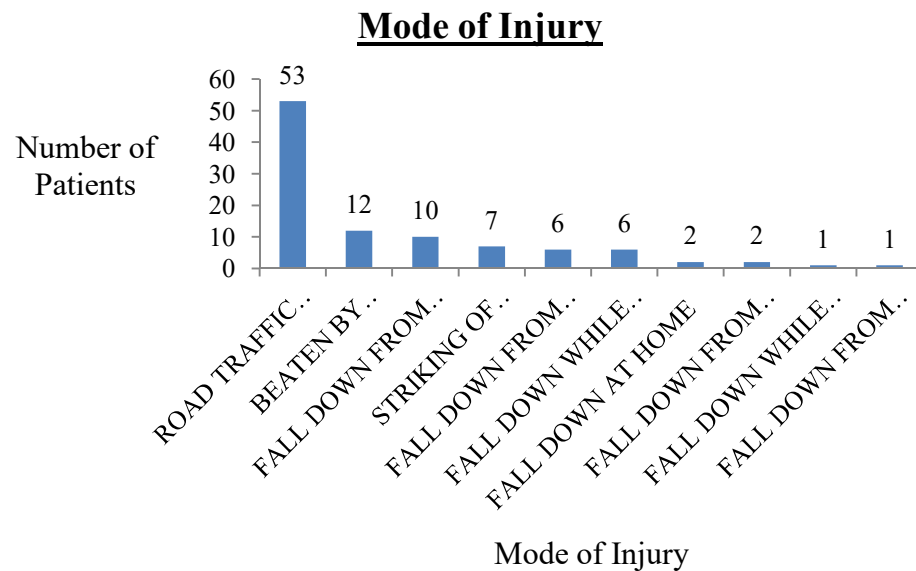


The most common form of intervention was operative, in which the interlocking nail was used most frequently (43 patients) followed by plating (30 patients). This was considered the best form of management in a study by Foote *et al*<sup>3</sup> in 2015. In one patient operative intervention was not required because of minimal displacement.



The most common cause of tibial fractures was seen to be road traffic accidents (RTAs) (53 patients). This was also observed in other independent studies in developing countries, as seen in the study by Clelland *et al*<sup>4</sup> in 2016 and by James and Kealey<sup>5</sup> in 2014.. Assault (beaten by

opposite party) was a distant second, while fall down from height and whilewalking was seen in



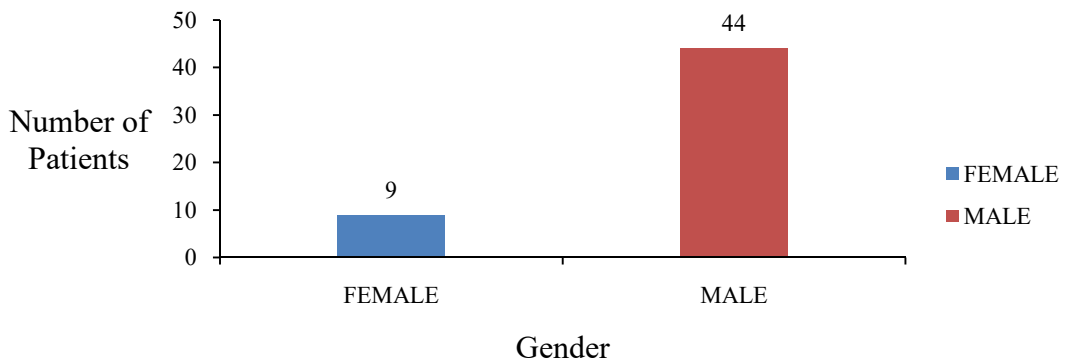
only 6 patients each.

### **Evaluation of patients with RTA**

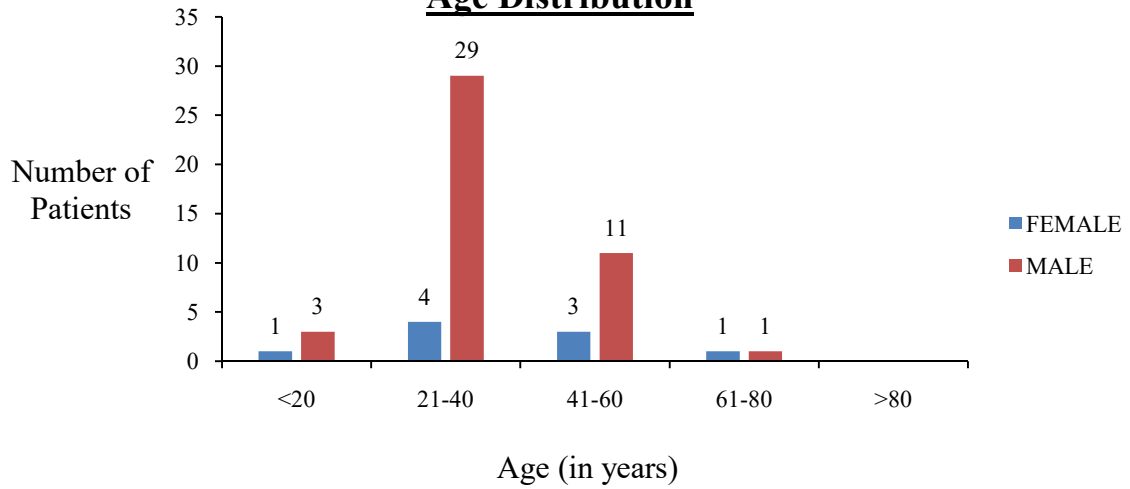
Out of a total of 53 patients that had experienced tibial fractures due to RTAs, majority were male (44 patients) between the ages of 21 and 44 (29 patients) as observed by Clelland *et al.* in 2016<sup>4</sup>. This was also seen by Elsoe *et al*<sup>1</sup> in 2015. Isolated tibial fractures were seen more commonly (35 patients), and more so on the left limb in males, while the fractures were seen in either limb equally commonly in females who had an RTA. Bilateral fractures were seen only in

male patients.

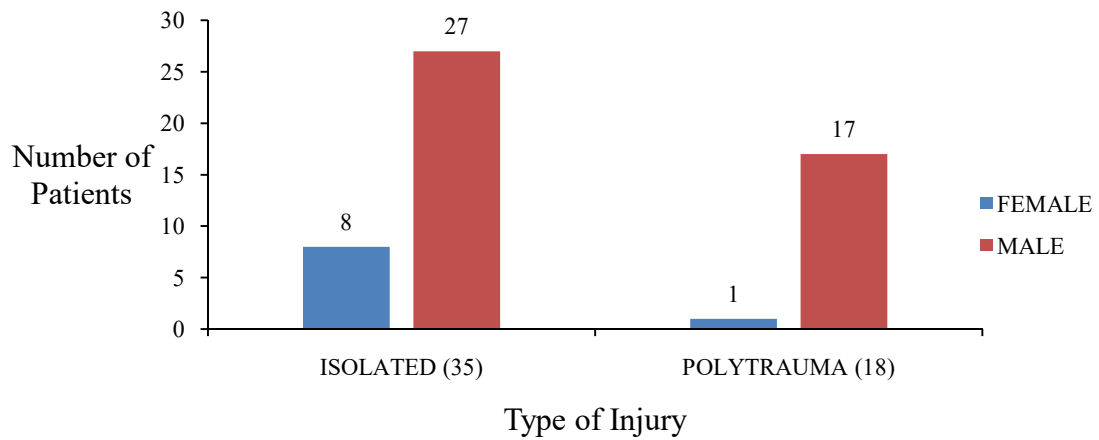
**Gender Distribution**



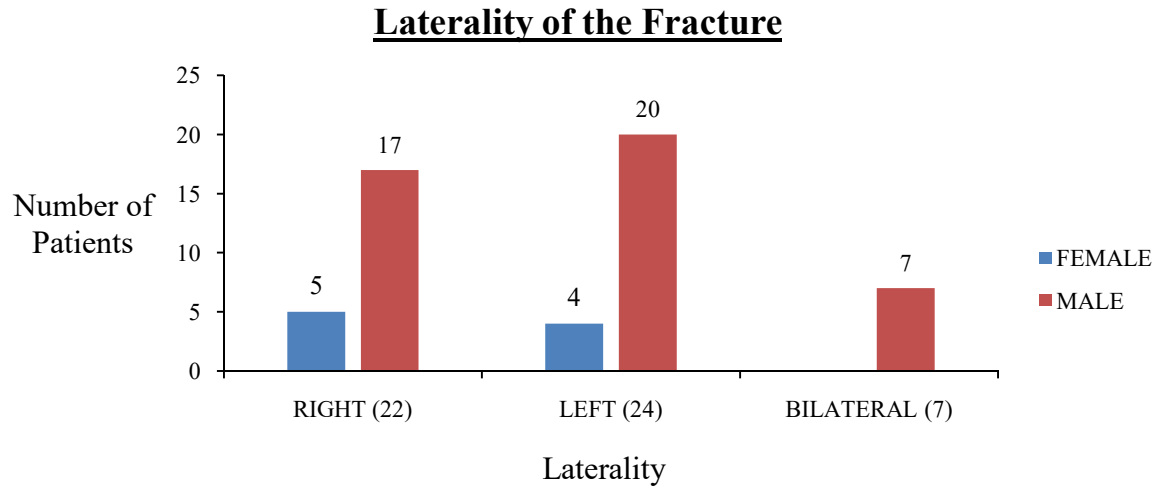
**Age Distribution**



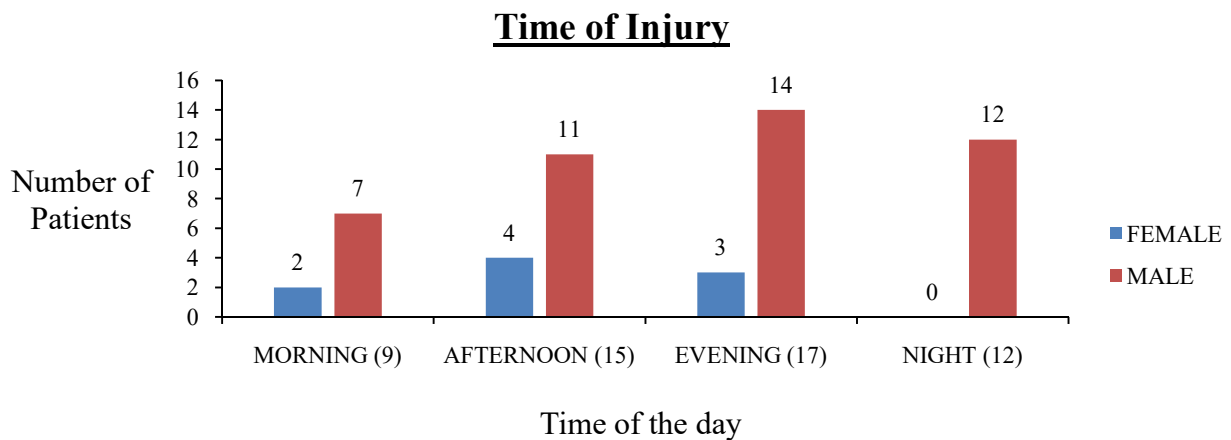
**Type of Injury**



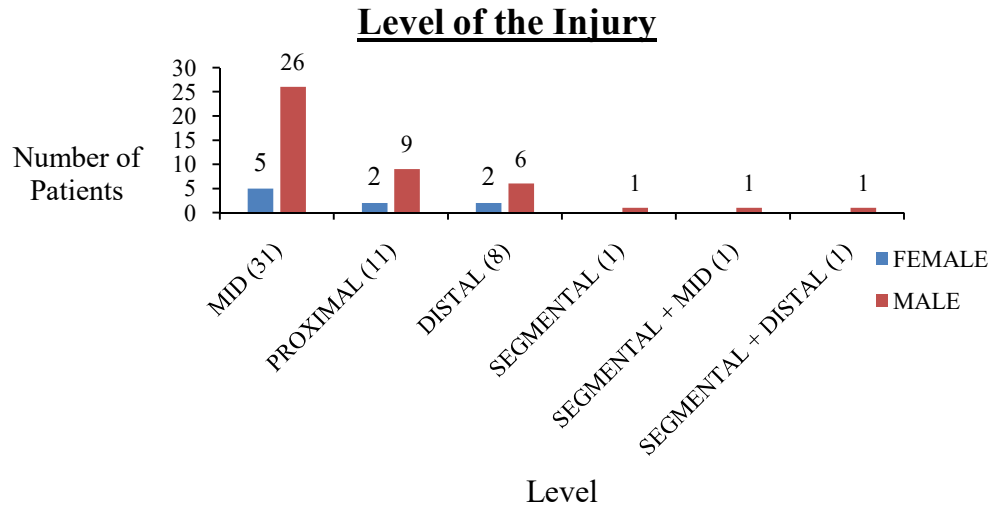




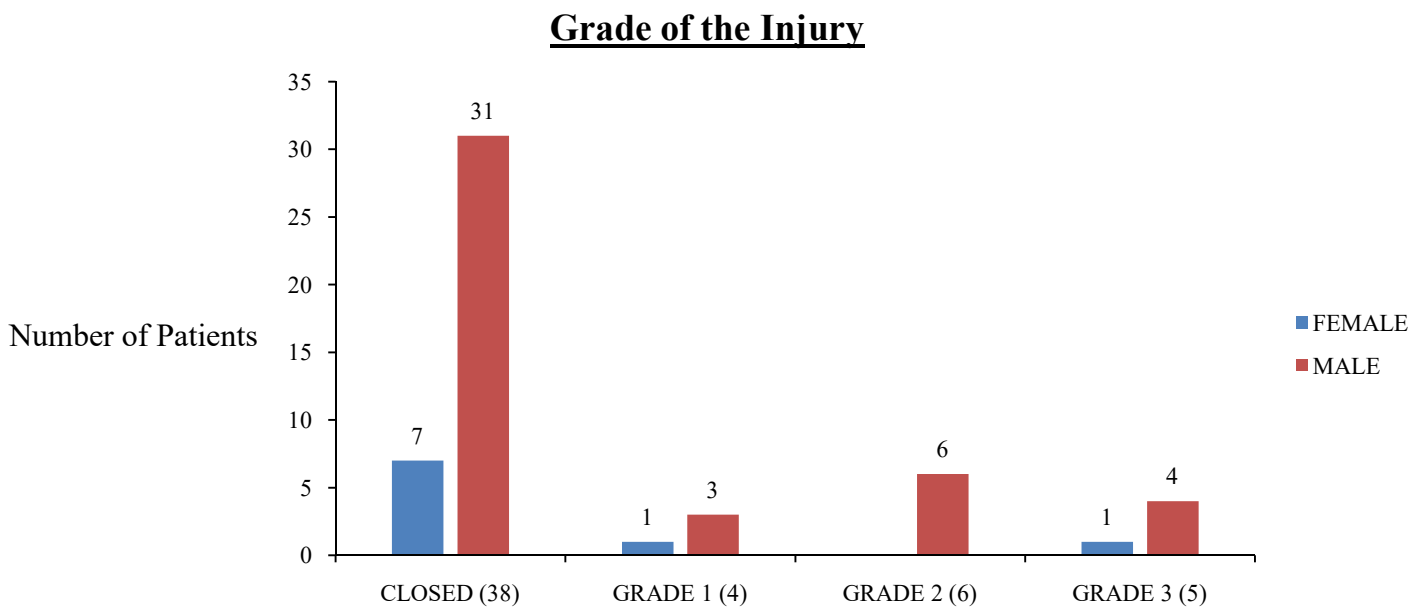
While male patients presented more commonly in the evening and night time (14 and 12 patients, respectively), females were seen more commonly during afternoon and evening (7 patients in total).



As seen in general, mid shaft fractures were more commonly seen than proximal fractures and distal fractures. Both the bilateral fractures had an element of segmental fracture in one limb, while the other showed mid shaft fracture or distal shaft fracture.

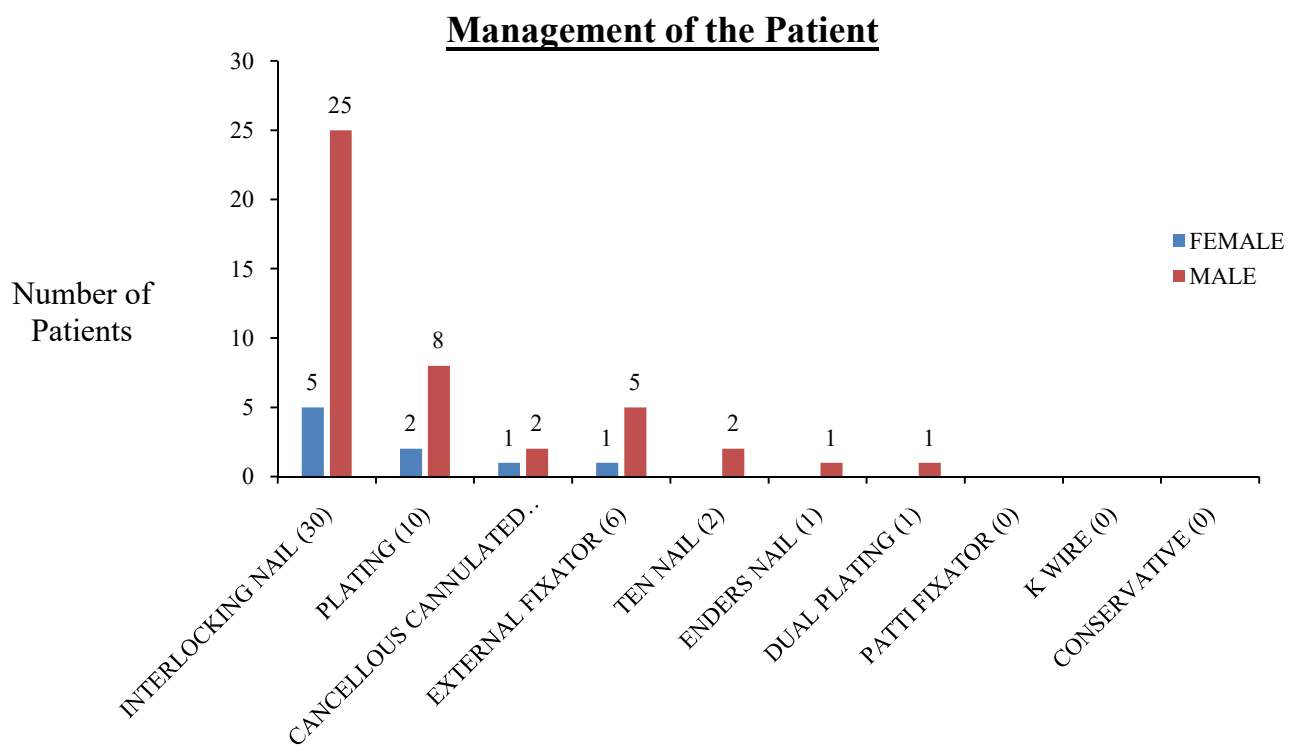


Again, as seen generally, closed fractures were more common than open ones. However, none of the females we observed had open grade 2 fractures.



All the patients who had presented with tibial fracture due to RTAs were managed operatively. Most of the patients were managed using interlocking nails (30 patients) or plating (10 patients). Nailing required the least re-operative intervention, followed by external fixation and plating, as seen in the study by Foote, *et al.*<sup>3</sup> in 2015.

However, patients with open fractures were mostly fixed with external fixator as a primary damage control surgery. This was later converted to internal fixation once the wound management was complete.



## **CONCLUSION**

In our study, we found that road traffic accident was the most common cause for tibial fractures in adults. Tibial fractures were seen most commonly in young adult males who experienced road traffic accidents in the evening and night and all such fractures required operative management.

## **Take home MESSAGE:**

As per our study, maximum occurrence of tibia fracture is in young male adults involved in motor vehicle activities. Accidents tend to occur in high traffic zones which are most crowded during evening hours

Young males need to follow traffic rules and proper safety measures. Their morbidity is a burden on their family as well as the community, both mentally and economically.

## **DRIVE SAFE!**

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Original article

**COMPARATIVE STUDY OF EFFECT OF MEDITATION ON RESTING CARDIOVASCULAR PARAMETERS IN HEALTHY MEDITATORS AND NON-MEDITATORS.**

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**Abstract:**

**Background:** Meditation has been practiced all over the world, to increase calmness and physical relaxation, to improve psychological balance, to cope with illness, or to enhance overall health and well-being. Meditation is a practice where one focuses his or her mind on a particular object, thought or activity to achieve a mentally clear and emotionally calm state. It has been shown by previous studies that meditation influences autonomic nervous system (ANS). ANS plays a vital role in regulation of various cardiovascular parameters like pulse and blood

pressure. The present study was designed to observe the effect of meditation, on cardiovascular parameters like pulse and blood pressure. **Aims and objectives:** To study the effect of meditation on resting pulse and blood pressure in normal subjects. **Methodology:** Permission of institutional ethical committee was taken before study. Subjects included 100 healthy meditators and 100 healthy non meditators. Resting cardiovascular parameters like pulse and blood pressure was measured in both groups and compared. The data was analysed using demo version of SPSS 20.0 to obtain the arithmetic mean for age, height, weight, BMI, systolic and diastolic BP, heart rate.

**Results:** The mean values of resting cardiovascular parameters like heart rate, systolic blood pressure, diastolic blood pressure were statistically significantly less in meditators than non-meditators. **Conclusion:** Regular meditation increases parasympathetic dominance in our body and reduces the sympathetic drive. This result in better cardiac reserve in meditators compared to non-meditators. Also, regular meditation helps meditators to combat anxiety and stress effectively.

**Key words: meditation, pulse, blood pressure.**

### **Introduction:**

The English meditation is derived from the Latin 'meditatio' from a verb 'meditari' meaning "to think, contemplate, devise, ponder". Meditation is a practice where one focuses his or her mind on a particular object, thought or activity to achieve a mentally clear and emotionally calm state (1). Meditation refers to "A family of self-regulation practices that focus on training attention and awareness in order to bring mental processes under greater voluntary control and thereby foster general mental well-being and development and/or specific capacities such as calm, clarity, and concentration" Shapiro and Walsh (2). Goleman stated that "the need for the meditator to retrain his attention, whether through concentration or mindfulness, is the single invariant ingredient in... every meditation system" (3). Meditation techniques have also been used for counselling and psychotherapy, as it has been proved that it reduces stress and anxiety. Meditation

produces mental and physical relaxation. From physiological point of view, meditation can induce an altered state of consciousness, corresponding to altered neuro-physiologic states. Meditation has been practiced all over the world, to increase calmness and physical relaxation, to improve psychological balance, to cope with illness, or to enhance overall health and well-being.

There are several techniques of meditation. Basically, all methods & practices of meditation come from following basic techniques: One can focus on breathing, one can focus on an object (e.g. light), focus on a sound, focus on a thought, focus on sensory perceptions. Based on these techniques, different methods of meditation have been described like Patanjali Rajyoga, Anapan Sati, Smriti Upasthan, Vipashyana, Prekshadhyan, Jaindhyan, Transcendental. Amongst others are Mantra dhyana, Zen meditation, Yoganindra, Nyas, Dynamic meditation, Sahajdhyan, Tratak, Kayotsarga, Atidhyana, Bhavidhyana, Swapnadhyan, Tahata, Spanddhyan etc. Real meditation can restore physical, mental & emotional health. It can be helpful in controlling several lifestyle disorders, psychosomatic disorders including high BP, coronary artery disease, diabetes, asthma, rheumatism etc. In this stressful life, it is a powerful weapon for acute as well as chronic stress. Meditation produces a specific positive physiological response pattern in our body. Meditation has effects on metabolic, autonomic, endocrine, neurological & psychological systems of the body. Some studies have proved that mindfulness practices are beneficial for the brain's self-regulation and control by increasing activity in the anterior cingulate cortex.

Meditation is associated with bringing relief in depression and anxiety, and guiding us towards happiness, relaxation, and emotional balance (4). Various studies have shown that mindfulness has resulted in increased antibody titers to the influenza vaccine (5).

Examination of brain waves suggest during meditation has shown that mental activity during meditation is wakeful and relaxed (6). Long term meditation has been shown to change brain anatomical structure like grey matter concentrations and the precuneus (7). Changes in gray matter improves learning and memory processes, emotion regulation, self-referential

processing, and perspective taking in meditators. Several researches have shown that meditation serves as a neuro protective factor that slows age-related brain atrophy (8). The autonomic nervous system is a part of nervous system which control subconsciously and regulates bodily functions such as the heart, digestion, blood vessels, respiratory rate, pupillary reflexes, urinary bladder and all internal viscera. The sympathetic nervous system is considered to be 'fight or flight' system, while the parasympathetic nervous system is considered the "rest and digest" system. ANS plays a vital role in regulation of various cardiovascular parameters like pulse and blood pressure. The present study was designed to observe the effect of meditation, on cardiovascular parameters like pulse and blood pressure.

**Aims and objectives:**

To study the effect of meditation on various cardiovascular parameters in normal healthy subjects.

**Materials and Methods:**

Permission of the institutional ethical committee was taken before the commencement of the study. Ours was a cross sectional, comparative study. 200 subjects between 18-45 years were included for the study. The subjects belonged to two groups: 100 meditators and 100 non-meditators. The meditators used to practice meditation every morning for at least 45 minutes, for 3 or more years at local meditation center under supervision of meditation guru. Non-meditators included subjects who had never done any kind of meditation. All subjects included in the study were healthy and matched for age, gender. Exclusion criteria were smokers, on any medication, any known disease, those having any type of addiction. Before testing, the subjects were laid down or seated for about 30 minutes in a quiet room with neutral temperature and humidity. Written informed consent of all the participants was taken before the start of the study. Detailed clinical history, anthropometric measurement and examination of subjects was done.



Sample size was calculated using the formula for difference of means. The data was analysed using demo version of SPSS 20.0 to obtain the arithmetic mean for age, height, weight, BMI, systolic and diastolic BP, heart rate, Difference in the mean values was subjected to Mann-Whitney U test. Power of the study was 80% and significance level was set as  $p < 0.05$ .

### Results:

Table 1 shows anthropological characteristics of meditators and non-meditators.

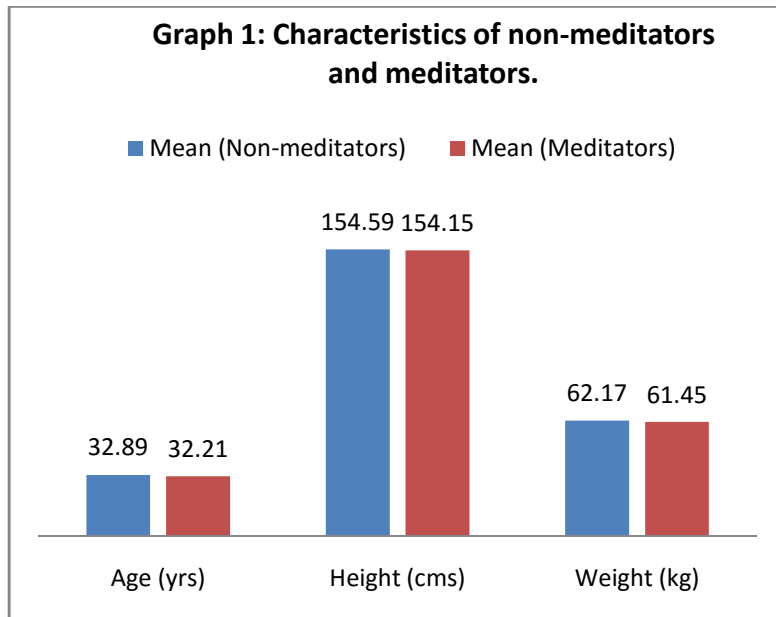
Table 1: Characteristics of non-meditators and meditators.

Anthropometric variables	Non-meditators n=100 Mean (SD)	Meditators n=100 Mean (SD)	p-value
Age	32.89 (6.28)	32.21 (5.71)	>0.05
Height (cms)	154.59 (2.74)	154.15 (3.67)	>0.05
Weight (kg)	62.17 (6.33)	61.45 (6.97)	>0.05

( $p > 0.05$  Not significant)

\* There was no statistical difference in mean values of age, height and weight as shown in Table 1.

Graph 1: Characteristics of non-meditators and meditators



\* Table 2 shows results (mean and SD) of resting cardiovascular parameters in meditators and non-meditators:

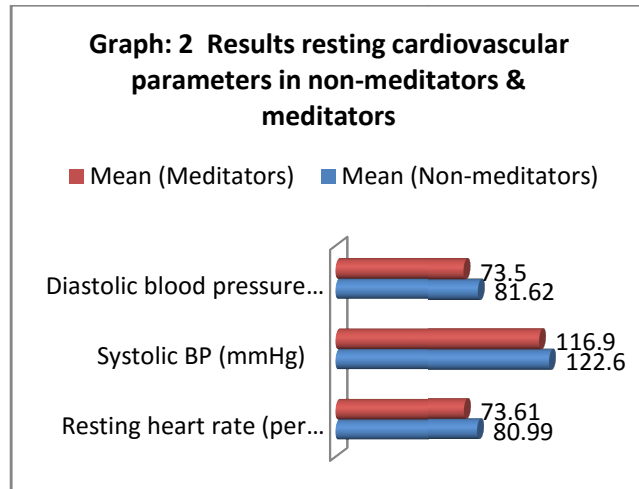
Table 2: Mean values of resting cardiovascular parameters in meditators and non-meditators.

Parameters	Non-meditators n=100 Mean (SD)	Meditators N=100 Mean (SD)	P-value
Resting heart rate (per minute)	80.99 (3.83)	73.61 (1.47)	p < 0.01
Systolic blood pressure (mmHg)	122.6 (5.07)	116.9 (4.92)	p < 0.01
Diastolic blood pressure (mmHg)	81.62 (2.17)	73.5 (4.77)	p < 0.01

(p < 0.01 highly significant)

\* The mean values of resting cardiovascular parameters like heart rate, systolic blood pressure, diastolic blood pressure were statistically significantly less in meditators than non-meditators as shown in Table 2.

Graph 2: Mean values of resting cardiovascular parameters in meditators and non-meditators.



### **Discussion:**

It has been established that physiological effects of meditation are mediated through autonomic nervous system (9, 10). Our results show that the mean values of resting cardiovascular parameters like heart rate, systolic blood pressure, diastolic blood pressure were statistically significantly less in meditators than non-meditators. Our results are similar to results by Desh Deepak et al (11). In their study they concluded that regular practice of meditation initially blunted the sympathetic drive and later on developed control over sympathetic function of meditators. This resulted in decrease in heart rate and blood pressure. Also, regular meditation over periods of years increases parasympathetic dominance resulting in increased vagal tone in meditators resulting in physiological bradycardia. A study by Desh Deepak et al concluded that in a person practicing meditation initially basal parasympathetic tone is increased and this

increase is greater in meditators of long term in comparison to those who have been practicing medication for a shorter term. Several studies by Cauthen and Pymk (12), Cuthburt, Kristeller, Simons (13), Hodes and Lang (14) concluded that heart rate reduces by meditation. However, English and Baker (15) concluded that transcendental meditation reduced blood pressure but did not affect heart rate. Our findings are also similar to other researchers (16, 17). Meditation reduces stress and anxiety in meditators leading to decreased stimulation of sympathetic nervous system resulting in decreased stimulation of sinoatrial node causing decrease in heart rate. Also less stimulation of sympathetic nervous system leads to vasodilatation resulting in decreased in diastolic blood pressure. Decreased force of contraction of heart results in decreased systolic blood pressure in meditators. All these changes in meditators increases cardiac reserve in meditators compared to non-meditators. Jyotsana. R. Bharshankar (18), in their study also concluded that values for resting HR, SBP and DBP were significantly lower in Raja-yoga meditators. This could be because dominance of parasympathetic over sympathetic system in meditators. Meditation reduces stress and anxiety in meditators leading to decreased stimulation of sympathetic nervous system. The results by Vempati RP suggest that sympathetic activity decreased after guided relaxation based on yoga, depending on the baseline levels (19). A study by Desh Deepak et al concluded that in a person practicing meditation initially basal parasympathetic tone is increased and this increase is greater in meditators of long term in comparison to those who have been practicing medication for a shorter term. In a study (20), the autonomic and respiratory variables were studied in seven experienced meditators (with experience ranging from 5 to 20 years). Each subject was studied in two types of sessions--meditation (with a period of mental chanting of "OM") and control (with a period of non-targeted thinking). The meditators showed a statistically significant reduction in heart rate during meditation compared to the control period (paired 't' test). During both types of sessions there was a comparable increase in the cutaneous peripheral vascular resistance. This was interpreted as a sign of increased mental alertness, even while being physiologically

relaxed (as shown by the reduced heart rate). It has been seen that regular meditation over years helps the body to experience high levels of stress with less sympathetic activation. In their study, Solberg et al (21) had concluded that male runners who meditated regularly by repetition of soothing sound had lower levels of lactic acid after exercise, due to blunting of sympathetic activity leading to parasympathetic dominance. Hence, body is able to relax more and perform better after performing physical activity before meditation. Regular deep relaxation normalized the function and improved the ability to cope by parasympathetic dominance. Out of sympathetic and parasympathetic, only one system is usually active at a particular time. Both systems exhibit reciprocal inhibition ie. When sympathetic nervous system is active, it inhibits parasympathetic nervous system and vice versa. During emergency or stressful situations, sympathetic nervous system is active. And during normal day to day activities, to promote balance and healing, parasympathetic nervous system is usually more active. However, due to modern stressful lifestyle, sympathetic system is used more often leading to literal 'burning out' of body nutrients. Meditation blunts sympathetic nervous system leading to parasympathetic dominance, helping body to heal and replenish.

### **Conclusion:**

From our study, it can be concluded that regular meditation increases parasympathetic dominance in our body and reduces the sympathetic drive. This result in better cardiac reserve in meditators compared to non-meditators. Also, regular meditation helps meditators to combat anxiety and stress effectively. Meditation helps to maintain normal homeostasis in our body. Hence, meditation should be practiced daily for overall well-being of the body.

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**Original article****PHYSIOLOGICAL ASSESSMENT OF COMMON CAROTID ARTERY END DIASTOLIC VELOCITY, A HEMODYNAMIC PARAMETER, WITH FUTURE RISK FOR THE DEVELOPMENT OF CEREBROVASCULAR STROKE****MANISHA B. MAKWANA\* ANAND MISTRI\*\* VILAS J. PATEL\*\*\***

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**Background :** Low End diastolic velocity of common carotid artery is potential hemodynamic marker of intracranial resistance and associated with ischemic stroke.

**Abstracts: Aim:** Assessment of Common carotid artery end diastolic velocity , a hemodynamic parameter, with the future risk for development of Cerebrovascular stroke . In order to assess common carotid artery end diastolic velocity , we have evaluated age, BMI, W/H , blood pressure , lipid profile and HbA1c in CV Stroke and control subjects. **Material method:** *The present study was conducted on 30 CV Stroke patients(Group A) and 30 non stroke hypertensive and diabetic patients (Group B) . CCA End diastolic velocity was assessed in each group by Doppler ultrasound machine. BMI and W/H was measured according to WHO protocol. Blood pressure was measured by sphygmomanometer. Lipid profile and HbA1c was done by autoanalyser machine .* **Result :** *CCA End diastolic velocity in Group A and group B was found to be 10.49±6.02 & 17.70±4.18 and 12.59±3.47 & 21.47±5.21 in right and left side respectively. The data was highly significant (p<0.0001).Age in Group A and B was found to be 62.8±9.11 and 53.87±10.06 respectively (p=0.0007). BMI in Group A and Group B was found to be 27.93±3.24 and 28.52±3.87 respectively (p=0.5245).W/H in Group A and Group B was 0.88±0.042 and 0.89±0.04 respectively (p=0.3489). Systolic and diastolic blood pressure in both the groups was found to be 148.02±14.77 & 138.93±7.04 and 88.33±5.97 & 84.53 ±5.75 which was statistically significant with p value 0.003and 0.014 respectively. The difference between mean of two groups for HbA1c ,HDL , LDL , triglyceride and total cholesterol in both the groups were 8.61±0.84 & 7.47±0.56, 38.7±5.42 & 49.91±8.333, 143.37±6.25 & 113.63±17.42, 136.63±12.11& 201.9±55.26 ,226.37±8.006 & 202.4±22.08 respectively which was statistically*

very significant( $p < 0.0001$ ). **Conclusion:** Carotid hemodynamic alterations expressed in Common Carotid Artery End diastolic velocity should be screened for future risk for development of CV stroke in hypertensive and diabetic patients with advance age. These findings need to be confirmed by a prospective study.

**Key Words:** CCA EDV ,CV stroke,HbA1c, HDL, LDL, Total cholesterol , triglycerid

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Original article

**27 PHYSIOLOGICAL ASSESSMENT OF COMMON CAROTID ARTERY END DIASTOLIC VELOCITY, A HEMODYNAMIC PARAMETER, WITH FUTURE RISK FOR THE DEVELOPMENT OF CEREBROVASCULAR STROKE ,authors MANISHA B. MAKWANA\* ANAND MISTRI\*\* VILAS J. PATEL\*\*\***

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**Key Words:** CCA EDV ,CV stroke,HbA1c, HDL, LDL, Total cholesterol , triglyceride

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### ***INTRODUCTION***

Stroke is global health problem. <sup>[1,2]</sup> It is the second commonest cause of death and fourth leading cause of disability worldwide <sup>[3]</sup>. Four out of 5 of the ischemic events are

caused by atherosclerotic diseases, with most changes affecting the carotid bifurcation.<sup>[4]</sup> It is one of the leading causes of death and disability in India.

End diastolic velocity meaning the capacity to provide blood in to the intracranial circulation at diastolic phase , is a more sensitive index to predict ischemic stroke.

Low end diastolic velocity of common carotid artery is potential hemodynamic marker of intracranial resistance and associated with ischemic stroke<sup>5</sup>.

### **Aim:**

Assessment of Common carotid artery end diastolic velocity , a hemodynamic parameter, with the future risk for development of Cerebrovascular Stroke .

### **Objective:**

In order to assess common carotid artery end diastolic velocity, we have evaluated age, BMI, W/H , blood pressure, HbA1c and lipid profile in CV stroke and control subjects.

### **Material method**

Present study was case control study. It was conducted in General population at GCS Medical College , Hospital and Research Centre, Ahmedabad. Subjects were selected randomly. Study subjects were hypertensive, type 2 diabetic and CV stroke patients. . The study was initiated after obtaining approval from Institutional Ethical committee. Informed consent was taken from each subjects. During the study period data were collected as per predesigned questionnaire.

We made two groups .

Group A : 30 CV stroke Patients

Group B : 30 Hypertensive and type 2 diabetic Patients.

Carotid sonography is a Noninvasive, accurate, and cost-effective unique imaging method for the investigation of carotid abnormalities.

Common carotid artery end diastolic velocity was assessed in each groups by Doppler ultrasound machine (Logiq P5 , GE Wipro) in Radiology department of GCS Medical College , Hospital and Research Centre, Ahmedabad.

The patient lie down in the supine or semi-supine position with the head slightly hyperextended and rotated 45° away from the side being examined. End diastolic velocity of both the side was examined .

Blood pressure was measured by Sphygmomanometer. Lipid profile was estimated by autoanalyzer machine (XL – 640) .

**Inclusion criteria :**

Age : 45 to 75 yrs

Sex : Male and female

Patients with CV stroke , hypertension and type 2 diabetes mellitus

**Exclusion criteria :**

Patients with Atrial Fibrillation

Valvular heart Disease

**Results:**

Statistical Software Med Calc Version 11.5.1.0 was used for data analysis. The Student t – test was applied to compare mean between two groups. P value < 0.05 were considered significant.

**Table 1. comparison of age, BMI,W/H and blood pressure in both the groups:**

Parameter	Group A	Group B	P value
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Age (Yrs)	62.8 ±9.12	53.87±10.06	0.0007
BMI(kg/m <sup>2</sup> )	27.93±3.24	28.52±3.87	0.5245
W/H	0.88±0.042	0.89±0.04	0.3489
Systolic BP (mm of Hg)	148.02±14.77	138.93±7.04	0.003
Diastolic BP (mm of Hg)	88.33±5.97	84.53±5.75	0.014

**Table No. 2 comparison of lipid profile and End diastolic velocity in both the groups:**

Parameter	Group A	Group B	P value
HbA1C (%)	8.61±0.84	7.47±0.56	P<0.0001
HDL (mg/dl)	38.7±5.42	49.91±8.33	P<0.0001
LDL (mg/dl)	143.37±6.25	113.63±17.42	P<0.0001
Total Cholesterol (mg/dl)	226.37±8.006	202.4±22.08	P<0.0001
Triglyceride (mg/dl)	136±12.11	201.9±55.26	P<0.0001
Right CCA End diastolic velocity (cm/sec)	10.49±6.02	17.70±4.18	P<0.0001
Left CCA End diastolic velocity (cm/sec)	12.59±3.47	21.47±5.21	P<0.0001

### **Discussion:**

It is reported that lower blood flow velocity of extracranial carotid arteries associated with the ischemic stroke independently of carotid atherosclerosis.<sup>[5]</sup> In our study we found the difference of right and left CCA End diastolic velocity of both the groups was statistically very significant with p <0.0001.

As hypertension, diabetes, hyperlipidemia and age are most prevalent risk factors for CV stroke, we found positive correlation of these risk factors in case group.

Age is an important nonmodifiable risk factor for stroke. The mean age of stroke onset in India (i. e., 63 years) is lower than that in Western countries (68 years in the USA and 71 in Italy).<sup>[6]</sup> There were several studies in India determining risk factors of stroke. CCA End diastolic velocity is related with age, systolic-diastolic blood pressure and LVMI (left ventricular mass index) in hypertensive patient. This evaluation could predict the presence of early cardiovascular damage and provide an accurate estimation of overall risk in this population. In our study we found that in comparison of both the groups by t-test for systolic and diastolic blood pressure was statistically significant with p value 0.0003 and 0.014 respectively. In Statistical comparison of different parameters of lipid profile between two groups we found the

difference between values of HDL ,LDL, Triglyceride and Total cholesterol in both the groups statistically very significance by t-test with  $p < 0.0001$  respectively. The mean concentration of total cholesterol , LDL & triglyceride is higher and lower HDL in case group than control group. Difference of HbA1c Values between two groups was statistically very significant by  $p < 0.0001$  in t-test.

### **Conclusion:**

Carotid hemodynamic alterations expressed in Common Carotid Artery End diastolic velocity should be screened for future risk for development of CV stroke in hypertensive and diabetic patients with advance age. These

findings need to be confirmed by a prospective study.

### Carotid

hemodynamic alterations expressed in Common Carotid End diastolic velocity should be screened for future risk for development of CV stroke in hypertensive patients with advance age. These findings need to be c.

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## ORIGINAL ARTICLE

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**CLINICO-HISTOPATHOLOGICAL STUDY OF LEPROSY PATIENTS A TERTIARY CARE HOSPITAL BASED STUDY. AUTHORS DR. MOXDA S PATEL<sup>\*</sup>, DR. NIDHI D. PATEL<sup>\*\*</sup>, DR. PAYAL N. PADALIYA<sup>\*\*</sup>, DR. JAYASHREE M. SHAH<sup>\*\*\*</sup>**

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## ABSTRACT

**Background and Objectives:** Leprosy is a chronic infectious disease caused by Mycobacterium leprae involving skin and peripheral nerves. Depending upon the immune status of the patients there are different clinico-pathological presentation. Despite having been declared eliminated in December 2005 from India as a public health problem, the prevalence of leprosy exceeds 1/10000 population in certain districts/states of India. According to 4<sup>th</sup> World Health Organization report, India accounts for 60% of the world's new leprosy cases. This is due to stoppage of active surveillance after reaching elimination levels. A spurt in its prevalence motivated us to carry out the study. Our aim is to diagnose and typing of leprosy by histopathology and to correlate the clinical and histopathological diagnosis as per Ridley-Jopling



Scale to facilitate accurate therapy. **Material and methods:** The prospective study was carried out in the pathology department of AMC MET Medical College, L.G. Hospital, Maninagar, Gujarat from January 2016 to December 2017, after ethical clearance from institutional ethics committee. All the punch biopsy specimens of suspected patients of leprosy were subjected to histopathological examination. **Result:** A total of 90 cases were studied. Among the clinically suspected cases 67 were positive for leprosy. Male to female ratio was 3.5:1, the age ranged from 4 to 80 years. Maximum cases were classified as borderline lepromatous leprosy (22) and least cases of midborderline leprosy (2) and indeterminant leprosy (2). Maximum clinico-histopathological correlation was seen in tuberculoid leprosy (100%) and indeterminant leprosy (100%). **Conclusion:** Combining clinical, histopathological and microbiological diagnosis of leprosy is important for proper treatment of the patient and prevention of complications.

**Keywords:** Histopathology, Leprosy, Ridley-Jopling classification.

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## INTRODUCTION

Leprosy is a chronic granulomatous infection caused by *Mycobacterium leprae*. It is also known as Hansen's disease. *M. leprae* commonly affects the skin and nerves<sup>1</sup>. It can also involve muscles, eyes, bones, testis and internal organs<sup>2</sup>. Leprosy can cause various physical and psychological disabilities, due to which it is considered as one of the most feared and stigmatizing disease<sup>3</sup>. As per the latest available data from the World Health Organization, 57.8% of the new leprosy cases detected globally in 2012 happened to be from India<sup>4</sup>. Despite having been declared eliminated in December 2005 from India as a public health problem, leprosy continues to retain a prevalence rate (PR) higher than 1/10,000 population in parts of the country, namely, Dadar and Nagar Haveli (3.61), Chhattisgarh (2.13), Bihar (1.20), Maharashtra (1.09), and West Bengal (1.05)<sup>5</sup>.

Ridley and Jopling (RJ) proposed a histological classification scheme for leprosy in 1960's, that includes early indeterminant leprosy (IL), polar tuberculoid leprosy (TT), borderline tuberculoid leprosy (BT), mid-borderline leprosy (BB), borderline lepromatous leprosy (BL), and polar lepromatous leprosy (LL)<sup>6</sup>. The present cornerstone of strategy for leprosy control emphasizes early detection and adequate treatment of cases, so as to break the chain of infection<sup>7</sup>. So we evaluated the histopathological features of cases diagnosed as leprosy on clinical examination and also to assess the applicability of the Ridley-Jopling (RJ) system of classification in the current era of decreasing disease prevalence by correlating the clinical and the histopathological features<sup>8,9</sup>. The accurate histopathological response of the tissues correlated with gross clinical morphology increases the diagnostic accuracy not only of the cases suspected clinically but also of a variety of unrelated diseases mimicking the protean manifestations of leprosy. Interaction between pathologist and dermatologist may be beneficial for proper diagnosis and management of the patient<sup>10</sup>.

In 1982, World Health Organization (WHO) recommended the use of two different regimens of multidrug therapy for the treatment of leprosy on the basis of the RJ classification. According to this, IL, TT, and BT cases of leprosy are included in paucibacillary (PB) treatment

regimen, and BB, BL, and LL cases of leprosy are included in multibacillary (MB) treatment regimen<sup>11</sup>. Similarly, a BI value  $\geq 2$  at any skin site is considered as MB leprosy and a BI value  $< 2$  as PB leprosy. WHO has also recommended the method of counting skin lesions to determine treatment modality (PB leprosy,  $\leq 5$  lesions; MB leprosy,  $> 5$  lesions)<sup>12</sup>.

## MATERIAL AND METHODS

The prospective study was carried out in the pathology department of AMC MET Medical College, L.G. Hospital, Maninagar, Gujarat from January 2016 to December 2017 after ethical clearance from institutional ethics committee. All the punch biopsy specimens of suspected patients of leprosy were subjected to histopathological examination. Their age, sex and clinical findings were recorded on a proforma. In all cases, punch biopsies were stained by Hematoxylin and Eosin stain and 5% Ziehl-Neelsen stain for morphological assessment and identification of the lepra bacilli respectively and grouped histopathologically as per Ridley-Jopling Scale. Subsequently a clinico-histopathological correlation was done.

## RESULT

**Table 1 – Distribution of leprosy cases according to age and sex.**

Age (years)	Male		Female		Total
	POSITIVE	NEGATIVE	POSITIVE	NEGATIVE	
0 – 10	1	1	0	0	2
11 – 20	10	4	1	0	15
21 – 30	20	4	7	3	34
31 – 40	11	2	2	0	15
41 – 50	4	5	3	0	12
51 – 60	2	2	1	0	5
>61	4	2	1	0	7
<b>Total</b>	<b>52</b>	<b>20</b>	<b>15</b>	<b>3</b>	<b>90</b>

The study was carried out on skin biopsies of 90 clinically diagnosed untreated cases of leprosy of which 72 were males and 18 were females. The age ranges from 4 to 80 years with the majority of them in the age group of 21 to 30 years (Table-1).

**Table 2- Distribution of Leprosy cases according to Histological types.**

Histological type of leprosy	No.	%
TT	7	10.44
BT	17	25.37
BB	2	2.98
BL	22	32.53
LL	17	25.40
I	2	2.98
<b>TOTAL</b>	<b>67</b>	<b>100</b>

Histopathological features of leprosy were observed only in biopsies of 67 cases, while other cases which showed histological features of nonspecific dermatitis or with inadequate biopsies were excluded from clinic-histopathological correlation. The distribution of 67 cases on the clinical leprosy spectrum based on Ridley-Jopling scale revealed maximum cases (61.19%) in borderline group (BT+BB+BL) and least number (2.98%) of cases in indeterminate leprosy (IL) (Table-2).

**Table 3- Distribution of Leprosy cases according to Histopathological correlation.**

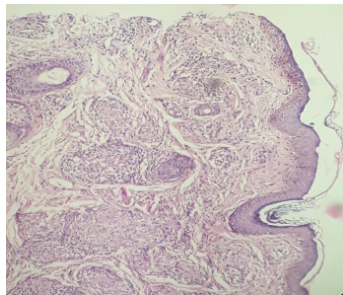
Types of leprosy	Clinical Diagnosis	Histopathological Diagnosis						Correlation with clinical type %
		TT	BT	BB	BL	LL	IL	
TT	1	1	0	0	0	0	0	100
BT	26	4	12	0	8	2	0	46.15
BB	2	0	0	1	0	1	0	50
BL	12	1	2	1	7	0	1	58.33
LL	25	1	3	0	7	14	0	56
IL	1	0	0	0	0	0	1	100
<b>TOTAL</b>	<b>67</b>	<b>7</b>	<b>16</b>	<b>2</b>	<b>22</b>	<b>17</b>	<b>2</b>	<b>53.73</b>
TT-TUBERCULOID LEPROSY; BT-BORDERLINE TUBERCULOID LEPROSY MIDBORDERLINE LEPROSY; BL-BORDERLINE LEPROMATOUS LEPROSY; LL-LEPROMATOUS LEPROSY; IL-INDETERMINATE LEPROSY								

Maximum clinico-histopathological correlation was seen in TT and IL (100%) followed by BL (58.33%), LL (56%), BB (50%) and BT (46.15%) (Table-3).

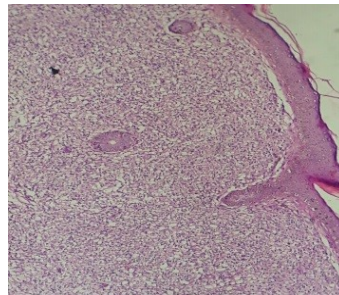
**Table 4- Comparison with other studies.**

Various studies	Concordance percentage
Our study	53.73
Shoba et al	65
Nadia et al	61.8
Sharma et al	53.44
Manandhar et al	45.33
Dyavannavar et al	20.53
Thapa et al	11.26

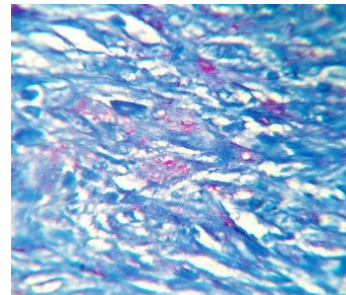
Overall concordance of diagnosis was seen in 53.73% in our study (Table-4).



**Figure 1a:**



**Figure 2a:**



**Figure 2b:**

**Figure 1a:** Photomicrograph of skin showing perineural and periadnexal lymphohistiocytic infiltrate (H&E, ×100). **Figure 2a:** Skin biopsy reveals a well defined grenz zone beneath which there are sheets of histiocytes (H&E, ×400). **Figure 2b:** Clusters of acid fast bacilli (Modified Ziehl-Neelson stain, Oil immersion)

## DISCUSSION

A disease like leprosy needs an appropriate classification because of its varied manifestations. The most commonly accepted classification by research workers is that of Ridley and Jopling which is primarily based on immunity but has been correlated with clinical, histopathological and bacteriological findings. Ridley and Jopling were the first to suggest a subdivision of leprosy on an immunological basis into five types; tuberculoid (TT), borderline tuberculoid (BT), midborderline (BB), borderline lepromatous (BL) & lepromatous (LL). Despite having such an accurate classification, leprosy cases showed so many diversities between the clinical and histopathological features.

**Table 5- Comparison and correlation with other studies.**

Correlation %	Our study	Nadia et al.	Sharma et al.	Shoba et al.	Manandhar et al.	Thapa et al.	Dyavannanavar et al
TT	100	72.7	47.37	42.85	24	66.6	66.6
BT	65	65.4	53.01	64.28	63.15	42.9	56.2
BB	50	50	37.35	55.55	0	0	0
BL	58.33	18.7	58.82	70	57.14	0	0
LL	56	79.2	75.86	78.57	57.14	16.7	12.5
I	100	0	100	81.81	0	0	0

In the present study the histopathological characteristics were consistent with the clinical diagnosis in 53.73% cases which was consistent with the study done by Sharma et al<sup>13</sup>. The

correlation percentage in other studies were 65% in Shoba et al<sup>14</sup>, 61.8% in Nadia et al<sup>15</sup>, 53.44 in Sharma et al<sup>13</sup>, 45.33% in Manandhar et al<sup>16</sup>, 20.53% in Dyavannavar et al<sup>17</sup> and 11.26% in Thapa et al<sup>18</sup> (Table-4).

Highest percentage of agreement between clinical and histopathological diagnoses is observed in tuberculoid leprosy which is in concordance to the observations recorded by Nadia et al<sup>15</sup> and with indeterminate cases which is in concordance to the observations recorded by Sharma et al<sup>13</sup>. Borderline lepromatous leprosy is in concordance to the observations recorded by Sharma et al<sup>13</sup> and lepromatous leprosy is in concordance to the observations recorded by Manandhar et al<sup>16</sup> (Table-5). Mid borderline leprosy is immunologically the least stable and variety of clinical lesions of different morphology may be found in the same patient. It is therefore necessary to relate the histological features with the clinical characteristics presented by the particular morphological lesion subjected to biopsy. If this is done carefully, it may be possible to achieve a better correlation of clinical with the histological changes.

## CONCLUSION

It is sometimes very difficult on clinical grounds to diagnose leprosy due to its varied presentation and it can also mimic various other diseases therefore histopathological examination is needed to confirm clinical diagnosis for proper treatment category and decrease the burden of the disease in the society.

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## **29**

### **MODEL FORMAT FOR REVIEWERS**

Authors conducted a research on \_\_\_\_\_.

The authors are the people who conducted the study \_\_\_\_\_..

Purpose\_\_\_\_\_..

Authors' hypothesis \_\_\_\_\_.

Subjects were \_\_\_\_\_.

Background section /literature review \_\_\_\_\_.

Methods; ethics? \_\_\_\_\_.

Sample size, \_\_\_\_\_.

Demographic characteristics, \_\_\_\_\_.

Protocol. \_\_\_\_\_.

Findings \_\_\_\_\_.

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Statistics: confused ? improvable? \_\_\_\_\_.

Discussion \_\_\_\_\_.

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Conclusion from authors \_\_\_\_\_

Authors suggested \_\_\_\_\_.

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A future line of research \_\_\_\_\_.

References :Style?\_\_\_\_\_

Major remark \_\_\_\_\_.

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Soft copy to bring on day of conference

**B**



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**ABSTRACT:** must be submitted on or before 15 August 2018.

**Deadline: 15<sup>th</sup> August for registration**

**Abstract of paper/poster**

Maximum 200 words, Must include in brief 1] Name of authors 2]

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Name of topic 5] Key words 6] Introduction 7] Methods 8] Results 9]

Name of statistical test 10] conclusions. 11] Refs

**Speakers** can send abstract of their presentation and will be published in Souvenir /Abstract book

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**C**  
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