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WORLD HEALTH DAY 2017 – MESSAGE

DEPRESSION: LET'S TALK

1 Editorial:**INTEGRATED MEDICAL EDUCATION****“CLINICAL /BED SIDE TEACHING CANNOT BE DISINTEGRATED “Dr Janardan Bhatt**

Integration is organization of teaching matter to interrelate or unify subjects frequently taught in separate academic courses or departments.

In current educational Strategies for Curriculum Development the SPICES model of education curriculum is emphasized .In SPICES model there are six alternate continuums of elements in teaching medical students. The six angels are

Student-centred vs Teacher-centred

Problem-based vs Information-gathering

Integrated vs Discipline-based

Community vsbased Hospital-based

Electives vs Standard Programme

Systematic vs Apprenticeship-based.

SPICES is a word made by first letter of modern education curriculum development approach .The proposed modern medical educational curriculum is **S**tudent-centred ,**P**roblem-based , **I**ntegrated, **C**ommunity-based **E**lectives and **S**ystematic . The SPICES model is supported by many research evidences and human cognitive psychologists.

In context to Integrated medical education , SPICES model support Integrated medical education. The traditional approach is discipline or department based curriculum .In traditional medical education in many medical colleges ,the teaching of individual disciplines i.e. physiology, Anatomy is done in the form of didactic lectures , tutorials ..in individual departments and contact of patients is usually later after basic sciences courses are over. In traditional teaching all disciplines are taught in different departments or compartments and students

have to integrate themselves when facing clinical problem at bed side. But the integrated teaching curriculum emphasis on bringing all subjects together in meaningful way on bed side solving problem. So Integrated teaching is obviously both students centered and problem based .In the very early years of under graduate education, students are divided into small groups and explored to acute or chronic clinical conditions and to understand problem , In such context students have to apply knowledge of basic medical sciences.

Let us consider a primary health center of India or private setup where a Indian medical graduate is working independently and individually. Now how can one think that he/she will manage the cases in disintegrated manner? If he/she /our competent Indian medical graduate is working and manage alone ,he/she have to work and manage the case in integrated manner. SO how the medical education system and curriculum can be disintegrated and discipline based? In context to integration of medical education Medical council of India has recommended modifications in the existing curriculum to accommodate the aspirations of the defined goals and competencies in vision Curriculum 2015 onwards ,i.e. alignment and integration (horizontal and vertical) of instruction, Integration of principles of Family Medicine ,integration of ethics, attitudes and professionalism into all phases of learning, assessment of newer learning experiences, competencies including integrated learning. There will be a Implementation Support Programme, which will assist the teaching faculty of the medical colleges to implement these changes especially integration of medical education at their own medical colleges. Even and above the information and communication technology ,the foundation courses ,early clinical exposure starting from the first year. Integration recommended is both Horizontal and Vertical .This innovative new curriculum has been structured to facilitate horizontal and vertical integration between disciplines, bridge the gaps between theory & practice, between hospital based medicine and community medicine. Basic and laboratory sciences (integrated with their clinical relevance) would be maximum in the first year and will progressively decrease in the second and third year of the training when the clinical exposure and learning would be dominant. The early Clinical Exposure from the first year and foundation course, focusing on communication, basic clinical skills and professionalism is key issue in these innovations. There

would be sufficient clinical exposure at the primary care level and this would be integrated with the learning of basic and laboratory sciences. Introduction of case scenarios for classroom discussion/ case-based learning would be emphasized. It will be done as a coordinated effort by the pre, para-clinical and clinical faculty. Impact will lead to a new generation of medical graduates of global standards. Improvements in the infrastructure and increased emphasis on faculty development will result in increase in the quality of the existing medical colleges. These in turn will lead to motivating young doctors into the academic career and will further enhance the quality of medical education and clinical research in the country. In context to competency based medical education, assessment must alien to teaching learning method and contract to traditional teaching, integrated medical teaching is far superior and going to be time tested and evidenced based method of education.

Because of its complexity integrated medical education is difficult to define but in nut cell the Integrated medical curriculum or course is a course that bring the basic sciences ,clinical sciences and social sciences together into one course. It has become norm in American medical colleges and schools .Conceptual theories , Evidenced based medicine and allied medical educational research has taught a lesson that Integrated medical education has created more competent medical graduates and clinicians. Bed side teaching and management cannot be disintegrated. This suggest the Indian medical education and curriculum need urgent reform in the form of development of and implementation of integrated medical education/curriculum. And this will need a lots of inter disciplinary teaching and collaboration and build an interdisciplinary links and resulting curriculum content . By integration the the barriers between subject are broken. There is better learning opportunities in and facilitate the clinical learning relevant & meaningful bed side practice .

As mentioned previously there are two type of integration ,Vertical integration brings basic and clinical science together especially in early and later years of graduate years .Horizontal integration bring all the disciplines, topics, subjects together that suppose to apply together in bed side medicine.

To begin an curricular integration some models have implicated .One such Harden et al model is ladder model and is narrated here briefly .In Harden model curriculum development is viewed as a step ladder process begins with bottom of the ladder as isolation and end up with full integration in trans-disciplinary integration at the top.

The 1st step Isolation step of integration ladder. Isolation is completely separate delivery of education..Teaching staff members plan delivery - in isolation and are un aware of what goes on else where .

2nd step Awareness step of integration ladder. Awareness is similar to isolation; there is communication between sub disciplines to ensure that The outcomes and content of each area are concepts are co ordinated. Cross-referencing may occur and duplication is usually avoided.

3rd step Harmonization step of integration ladder. Sometimes described as “connected “.there is attempts to ensure that sub disciplines coordinate and make use of points of commonality.

4th step Nesting step of integration ladder. Nesting is when material is still subject-based and skills, a directed by members of the individual discipline. However, the material is taught using context from another area. This step is sometimes referred to as “infusion.”

5th step Temporal coordination step of integration ladder. Also known as parallel teaching. Same content/subject matter is taught at the same time. Content remains discipline specific and make student opportunity for Temporal coordination.

6th step sharing step of integration ladder: two or more subjects are taught together the areas ,most likely as a result of overlap particular disciplines .

7th step Correlation step of integration ladder. With correlation integration, there is separate, discipline-based teaching, but made together by further integrative session

8th step Complementary step of integration ladder : In Complementary step there is extension o f correlation, but the integration sessions play a much larger and pivotal role.

9th step Multidisciplinary step of integration ladder. Sometimes referred to as webbed with Multidisciplinary integration . typically clinical cases where students

apply their all knowledge and skills to solve the clinical problem. tice-based problems. The discipline perspective is maintained but autonomy is lost.

10th step Interdisciplinary step of integration ladder . Autonomy and perspective of the individual discipline is lost. With all subjects being reduced to commonalities between discipline

11th step Transdisciplinary step of integration ladder :In Transdisciplinary students typically are immersed in a practice situation must integrate material from individual subjects in order to demonstrate the competencies in concerned task.

The author feels the model very practical to begin to develop an integrated curriculum. But because of its complexity , there is a great problem of acceptance and conceptualization of integrated medical education curriculum. As the stake holders , faculties and the students are used to with traditional compartment methods there is going to be a significant resistance in the beginning the implementation of integrated based curriculum in medical school. Integrated curriculum has been widely adopted in some medical college.

This approach is an holistic approach . And this process helps to create link between the different clinical areas. The learning is made explicit by interrelationships among various disciplines. The aim in integration is to beak separation of preclinical , para clinical and clinical studies and being student centered .The learning a life long phenomenon. The Change is eternal. This reform of integrated medical curriculum is inevitable but not without effective management of change commitment of faculty, departments, individual s; agreement on degree of integration ; development of teams to support planning and implementation .This is fundamental need to create a competent medical graduates in India.

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2 Original article:

STUDY OF RELATIONSHIP BETWEEN SERUM CALCIUM & ARTERIAL BLOOD PRESSURE IN PATIENTS WITH HYPERTENSION .

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ABSTRACT :

Hypertension is the commonest cardiovascular disorder, affecting 20 % of the adult population in many countries .It is linked with coronary heart disease,stroke,congestive cardiac failure and renal dysfunction and is one of the major risk factor for cardiovascular mortality,which accounts for 20 to 50 % of all deaths.The use of calcium channel blocking agents in the treatment of hypertension shows the critical importance of calcium in the biochemical control of vascular smooth muscle tone,and thus of blood pressure homeostasis.Therefore, we designed a study to find correlation between serum calcium levels and blood pressure .50 normotensive and 50 hypertensive were studied and compared.

AIMS & OBJECTIVE :

To estimate serum calcium in a group of hypertensive patients and matched controls .

To compare the level of serum calcium in hypertensive and normotensive control group .

To study correlation between serum calcium and arterial blood pressure in hypertensive individuals .

RESULT :In our study,a significant high levels of serum calcium were found in hypertensive group as compared to normotensive group($P < 0.01$). A statistically significant linear correlation was found between serum calcium and both systolic and diastolic blood pressure in hypertensive males ($P < 0.01$).

CONCLUSION :Our study shows a significant correlation between high serum calcium levels and high blood pressure.According to the present study,increased serum calcium leads to hypertension .Hence, serum calcium levels should be estimated in hypertensive patients .

INTRODUCTION :

The importance of calcium in cardiac muscle contraction, has been increasingly recognised(1). The use of calcium channel blocking agents in the treatment of hypertension shows the critical importance of calcium in the biochemical control of vascular smooth muscle tone, and thus of blood pressure homeostasis(2).

Despite the advances, the relation of clinical aspects of calcium metabolism such as dietary calcium intake, renal disposition of calcium and circulating levels of calcium regulating hormones, as well as calcium itself, to disorders of blood pressure regulation such as hypertension remains an ambiguous one. A rapidly expanding literature suggests that alterations of these clinical metabolic variables are indeed found in human hypertensive disease and they may contribute to the pathophysiology of hypertension(3,4,5,6). However, these alterations seem to suggest that calcium may either exacerbate or alleviate hypertension.

The report by McCarron and Morris (7) and other recent preliminary reports (8,9) show the ability of oral calcium supplements to lower blood pressure in some subjects with essential hypertension. Population survey show a positive relation between blood pressure and serum calcium levels (10), and increased intracellular free cytosolic calcium levels have been reported in hypertensive persons (11). Acute elevation or suppression of circulating calcium levels result in concomitant elevation or suppression of blood pressure (12,13) and the chronic hypercalcemia of hyperparathyroidism and vitamin D intoxication is also associated with an increased incidence of chronic hypertension (14,20). These all studies tend to portray calcium as a pathogenic or exacerbating factor in hypertensive disease.

Material and Method :

The subjects included in this study were 50 fresh hypertensive patients, who attended general OPD of JJ Hospital for minor ailments other than hypertension. Healthy age, sex and diet matched 50 normotensive individuals served as controls. All the individuals selected were apparently in good general health. A full medical history of these subjects was first obtained which provided the basis for selection. Informed written consent was taken before the studies from study group and control group.

Inclusion Criteria : All the male subjects belonged to the age group 22 – 75 years. All the subjects had their weight between 52 -92 kgs. Only subjects with mixed diet were included in the study. Subjects who did not give history of consuming alcohol and smoking were taken. All subjects chosen were employees having a similar level of physical activity. Subjects belonged to the middle socio economic strata.

Exclusion Criteria : Subjects with clinical history of ischemic heart disease, thyroid, hepatic, renal or pancreatic disorders. Subjects who were on any drugs for systemic disease.

The protocol of the study was approved by the ethical committee and departmental research committee, Grant govt medical college, Mumbai.

Method :

Measurement of arterial blood pressure :It was based on actual blood pressure recorded with standard mercury sphygmomanometer.Blood pressure was recorded from the right arm for three times at three minute intervals with the subject in supine position .

Estimation of serum calcium level:Serum calcium estimation was done by Trinder's method.With the help of photometric technique(15,16) .

Statistical Analysis :

To test whether there was any significant difference in the study variables between the study groups (normotensives and hypertensives),Z test was applied.The Z test is a test of significance between mean values of any two groups whose number is more than 30.A Z value of more than 2 is significant at 95% level of significance(23).Correlation coefficient (r)/ Pearson product –moment correlation coefficient test was used for linear relationship between two variables .

Observation:

Table No.1: Age Distribution in study group

Study Group	Age Range (yrs)	Mean (yrs)	Standard Deviation
Normotensives (n=50)	22-75	44.14	13.3057
Hypertensives (n=50)	25-73	42.54	10.2649

Table 1 indicates that out of 50 normotensive patients studied their age were between 22-75 yrs,while the hypertensive patients had their age between 25-73 years .The mean age of normotensive patients was 44.14 years and the standard deviation worked out to be 13.3057 years.The mean age of hypertensives was 42.54 years with a standard deviation of 10.2649

Table No 2 :Mean Serum Calcium levels in study groups

Study Groups	Mean Serum Calcium mgm%	Standard Deviation (S.D)	Standard Error (S.E)	Mean \pm 2 S.E. 95% Confidence interval (C.I)
Normotensives (n=50)	9.268	0.646	0.0913	9.0854-9.4506
Hypertensives (n=50)	11.232	1.1875	0.1679	10.8962-11.5678

Z=4.2786 , P<0.01 (Highly Significant)

Mean serum calcium of the normotensive group was 9.268mgm% with a standard deviation of 0.6460 and standard error of 0.0913. Mean serum calcium of the hypertensive group was 11.232 with a standard deviation of 1.1875 and standard error of 0.1679. There is an apparent difference in the two observed means. Z-test was applied to test this difference. The Z value worked out to be 4.2786, which was statistically significant i.e. $P < 0.01$. Thus it is highly unlikely that this difference has occurred by chance. Thus, findings were confirmed by the 95% confidence intervals values in the two groups. In the normotensive group the 95% confidence interval limits were 9.0854-9.4506. 95% confidence interval limits in the hypertension group were 10.8962-11.5678. As the above limits in the two groups do not overlap, there is a significant difference between mean serum calcium values in the normotensive group viz hypertensive group.

Table .No 3 :Correlation coefficients

	Correlation Coefficient 'r'	P Value
Systolic blood pressure Vs serum calcium	0.55	<0.01
Serum calcium Vs systolic blood pressure	0.53	<0.01
Diastolic blood pressure Vs serum calcium	0.55	<0.01
Serum calcium Vs diastolic blood pressure	0.52	<0.01

In all the four situations, the correlation coefficient were highly significant at degrees of freedom, 48(n-2) ($P < 0.01$). Thus, correlation between the above variables is highly unlikely to have occurred by chance and is highly significant.

Discussion :Cardiac muscle relaxes completely between beats. Under these circumstances, calcium is well below 10^{-7} M, the threshold concentration for contraction. A very different situation is encountered in vascular smooth muscle. Some resting tension (tone) is normally maintained in most resistance vessels. This implies that intracellular calcium, must be constantly maintained above 10^{-7} M because there is no reason to suspect that other factors such as the intracellular magnesium or adenosine 5 triphosphate concentrations are limiting (17). It is generally recognised that most forms of hypertension are associated with an increased peripheral resistance due to maintained abnormal constriction of the small "resistance vessels". Thickening of the vessel walls and consequent narrowing of lumina may contribute to the maintenance of chronic hypertensive state.

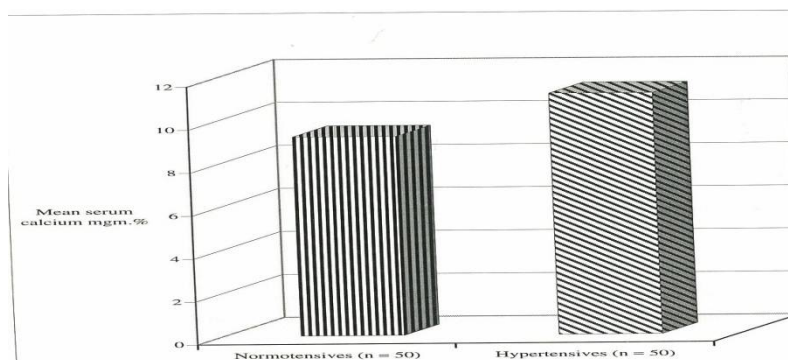
In our study, a significant high levels of serum calcium were found in hypertensive group as compared to normotensive group ($P < 0.01$). Tobain L.J (18) has stressed the fact that increased vascular smooth muscle tone must play an important role. Hypertension is usually present before the vessel wall changes occur and the blood pressure can return to normal after treatment, even though the vessel walls throughout the body remained thickened. Thus, changes in tone reflect changes in intracellular calcium and that a rise in the mean intracellular calcium may be final common path by which most, if not all, hypertension is produced.

Several lines of evidence support that the level of serum calcium may play a role in the regulation of blood pressure. Theoretically, such an effect may be mediated through a primary

change in cardiac output or peripheral vascular resistance or both, or through altered release or action, or both, of pressor substances such as renin and catecholamines.

Shiner P.T et al (19) reported, increased myocardial contractility and bradycardia without significant change in blood pressure during a short infusion in unanaesthetized humans, which elevated serum calcium by 1.5 mg/dl. Studies using local perfusion of the forelimb, kidney or heart in the dog showed that a slight elevation of calcium in the perfusate caused both arteriolar constriction and increased myocardial contractility. But no consistent change in cardiac output has been found during calcium infusions. It seems likely therefore, that an increase in peripheral resistance is the major factor underlying the hypertension induced by hypercalcemia. Many workers have implicated calcium in the pathogenesis of some forms of hypertension. Increase in platelet cytosolic calcium level has been reported in some hypertensives (2). Hypertension has also been found in patients with hyperparathyroidism as well as in hypercalcemic states (18). The mechanism by which hypercalcemia elevates blood pressure, probably involves a direct increase in the contractility of vascular smooth muscle and activation of sympathetic nervous system.

In the present study, the total serum calcium level is studied. The ionized serum calcium level is not studied. It can be assumed, however, that in a population with a normal total serum protein content and a normal serum pH both factors known to influence the relation between total and ionised calcium – ionised calcium will be a constant function of total serum calcium. Our findings might also help to explain the beneficial role of calcium antagonists in the treatment of hypertension (20). It is quite clear from this study that increased serum calcium level is significantly associated with hypertension and so by giving calcium supplement it might worsen the situation (21). Hence, its use in the treatment in hypertensive patients is questionable and needed to be studied in great detail. Though some studies contradict this statement (22).



CONCLUSION :

Our study shows a significant correlation between high serum calcium levels and high blood pressure. According to the present study, increased serum calcium leads to hypertension. Hence, serum calcium levels should be estimated in hypertensive patients.

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3 Original articles:

Binocular Reading Speed with Increased Vertical and Horizontal Word Spacing in Normal and Low Vision

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ABSTRACT

PURPOSE: The aim of the study was to evaluate reading speed with increased vertical and horizontal word spacing in subjects having normal vision and low vision.

METHODS: Reading speed was measured in 23 normal and 23 low vision subjects. Data were collected using paragraph reading from laptop screen with Times new Roman font with critical print size. Stopwatch was used to measure the reading speed in word per minute (WPM). Reading speed was again measured by increasing vertical and horizontal word spacing from 1x to 5x.

RESULTS: Reading speed increases gradually with increased vertical and horizontal word spacing up to 3x and then decreases gradually in normal subjects while in low vision subjects minimal changes were observed.

CONCLUSION: An increase in vertical and horizontal spacing up to certain extent is beneficial in normal vision subjects while in low vision patients minimal changes are observed while reading.

KEYWORDS: word spacing, reading speed, low vision

INTRODUCTION: Reading speed is defined as the rate at which subject reads written text in a specific unit of time. It is generally calculated by the number of words per minute. It is important not only for reading medicine labels, newsprint or books but also important for reading road signs, driving directions, spotting words etc. Factors that significantly affect reading speed are acuity reserve, contrast reserve, field of view and central scotoma size in case of maculopathy. Other factors which affect central and peripheral reading speed are poor spatial resolution; poor eye movement control, lowercase and uppercase letters, glare and crowding phenomenon.

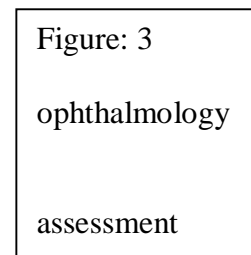
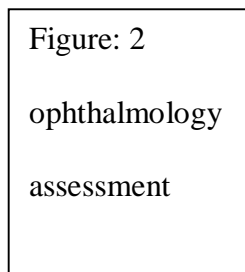
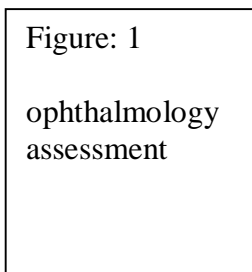
"Crowding" effect, is related to the difficulty of reading letters caused by the requirement of finer eye movements to read letters when they are in a tightly packed array.¹ Crowding refers to the decrease visibility of a visual target in the presence of nearby objects so it has been suggested as a major factor contributing to decrease in reading speed. In the present study, we tried to explore whether increase in letter spacing between adjacent characters, will improve the reading speed by decreasing crowding.

METHODOLOGY A cross sectional experimental study was performed. A total of 23 normal vision subject and 23 low vision subjects between age group of 16 and 25 years were considered. For normal vision subject, a minimum visual acuity of N8 for near without any ocular pathology was considered. For low vision subject, visual acuity greater than N18 for near without ocular pathology which can affect visual field, ocular motility and history of head trauma were considered. All subjects underwent detailed ocular examination including history taking, anterior segment evaluation, fundus evaluation followed by objective and subjective refractive correction.

Reading speed measurement was taken in both the subject groups using a Laptop Screen of 15.6 inch. Words were rendered in Times New Roman fonts which is one type of word style used in many news-papers, magazines and books as well as it is very popular for writing. Consequently these were selected to construct the paragraph for reading. For measurement of reading speed, critical print size was considered. The critical print size is the optimal print size for reading because it is the smallest print size at which subjects read with their maximum rate. The reading text was extracted from 4th and 5th standard story book as majority of subject had English as their second language.

For subjects with normal vision, the viewing distance was 60 cm and for low vision subject read at their habitual reading distance. Subjects with low vision who preferred to read using a specific retinal location were allowed to position the screen so that the text would fall into their preferred region of vision. Starting with the preferred print size and standard letter spacing of 1x, subjects were instructed to read each sentence, one at a time, as quickly and as accurately as possible. The letter spacing is defined as the centre-to-centre separation between adjacent letters. The standard spacing for the Times New Roman font is 1.16 times the width of the lowercase letter x, for a wide range of x-widths tested. The subjects were informed that reading speed was being measured and were asked to continue reading to the end of the sentence before correcting any reading errors they might have made. After the initial reading speed measurement the vertical letter spacing was increased from 1x to 1.5x, 2x, 2.5x, 3x, 3.5x, 4x, 4.5x and 5x and reading speed was measured using the same method. Fig.1, 2 and 3 shows vertical letter spacing of 1x, 2x and 3x respectively.

The procedure was repeated for horizontal reading. Reading speed in word per minute (WPM) was determined for each sentence as the number of standard length words read correctly, divided by the time taken to read the sentence. For data collected, the reading time was measured from the moment the sentence was revealed to the subjects until the subject finished uttering the last word of the sentence.



RESULTS: Table 1 and 2 shows the mean value of reading speed with horizontal and vertical

word spacing in normal subjects and in low vision subjects

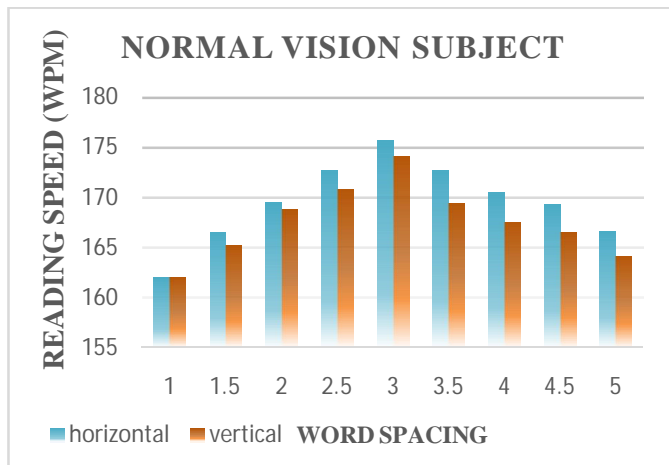
TABLE 1:

Word spacing	1	1.5	2	2.5	3	3.5	4	4.5	5
Horizontal reading speed (WPM)	162.0 4	166.5 2	169.5 2	172.7 3	175.69	172.7 3	170.47	169.30	166.60
Vertical reading speed (WPM)	162.0 4	165.1 7	168.8 7	170.8 2	174.08	169.3 9	167.56	166.56	164.13

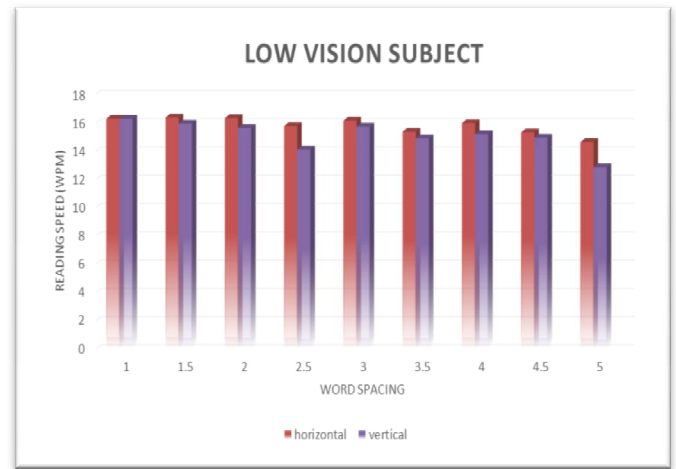
TABLE 2:

Word spacing	1	1.5	2	2.5	3	3.5	4	4.5	5
Horizontal reading speed (WPM)	16.260	16.347	16.304	15.739	16.130	15.347	15.956	15.304	14.608
Vertical reading speed (WPM)	16.260	15.913	15.608	14.086	15.695	14.869	15.173	14.913	12.826

Graph 1 and 2 shows comparison of reading speed with increased vertical and horizontal word spacing in normal vision subject and low vision subject respectively. The reading speed increases gradually with horizontal and vertical word spacing of 3x and then decreases gradually in normal subjects while the reading speed in low vision subject gradually decreases if horizontal word spacing increases beyond 2x and vertical word spacing increases beyond 1x.



Graph 1: Reading speed in Normal Vision



Graph 2: Reading speed in Low Vision

DISCUSSION:In this study we compared the letter by letter crowding effect with performance measurement for recognizing a target with or without flanking objects. We had measured reading speed and in that, our target and flanking objects were word instead of single letters. It

is observed that reading speed increased with increase of spacing up to 3x in normal subjects but then it gradually decreased. The increase in reading speed occurred due to decrease in crowding phenomenon. With further increase of spacing, saccadic eye movement increases which decreases the reading speed.

Mansfield JS³ measured the influence of different fonts in reading with normal and low vision and concluded for normal subjects, the differences are slighter, with an advantage in reading speed for Times. However, for print sizes close to the acuity limit, choice of font could make a significant difference in both normal and low vision reading performance. So, in the present study we used Times New Roman Font for estimating maximum reading speed of subject.

Bentley¹⁰, Peterson and Tinker¹¹, examined the effect of line spacing on reading speed and concluded that increased vertical word spacing, benefits reading speed. Similar result is obtained in present study but up to a spacing of 3x

Calabrese A. et al.¹⁵ concluded that increasing interline spacing is advisable only for very slow readers (<20 words/min) who want to read a few words (spot reading). Vertical crowding does not seem to be a major determinant of maximal reading speed for patients with central scotoma while Chung ST¹⁵ et al. concluded that increased line spacing in passages, or increased vertical separation between words in RSVP (rapid serial visual presentation), did not lead to improved reading speed in people with AMD. Rubin GS⁹ stated that line width and typeface have little influence on reading speed in people with mild to moderate sight problems. In our study, we have not considered specific group of disease but overall low vision subjects. Future studies are required in low vision subjects to assess reading speed in central and peripheral field loss separately.

CONCLUSION:

An increase in vertical and horizontal spacing up to certain extent is beneficial in normal vision subjects while in low vision patients minimal changes are observed in reading speed.

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4 original article

EVALUATION OF SYMPATHETIC CARDIO VASCULAR REFLEXES IN DIABETIC PATIENTS & ITS CORRELATION WITH DURATION OF DISEASE

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ABSTRACT

INTRODUCTION: Diabetes mellitus has severe complication like retinopathy, neuropathy nephropathy. Sympathetic neuropathy is chronic diabetic complication which silently leads to morbidity & mortality. As there are numerous range of autonomic function tests we need to be focused & specific for what we are looking for. Sympathetic neuropathy which creates great load of morbidity needs to be evaluated & treated specifically.

OBJECTIVE: To evaluate sympathetic nervous system in diabetic patients and look for effect of duration of disease on sympathetic neuropathy.

METHOD: The present study was carried out on the 500 study subjects divided into three case groups (according to duration of disease i.0-5 year ii.5-10 year iii. >10 year) & one non diabetic healthy control group. They were assessed for sympathetic neuropathy by Ewing's battery test.

RESULTS: The diabetic group shows more deranged sympathetic function tests than control group. The sympathetic function tests diversified to abnormality as the duration of disease increases. The sympathetic neuropathy is most prevalent in study group having disease for than 10 years.

CONCLUSION: Sympathetic neuropathy is prevalent & progressive with duration of diabetes.

KEY WORDS: Autonomic neuropathy, Sympathetic Function Test, Diabetes Mellitus

INTRODUCTION:

India faces a great health challenge named Diabetes. Diabetes is an iceberg disease. It is causing sever burden to Indian economy due to the high prevalence rate & its complication. The recent statements of World Health Organization (WHO) says that India already have the largest number of diabetic subjects (nearly 40 million) and it is predicted that this number would reach almost 80 million by the year 2030. The International Diabetes Federation says that number of people with diabetes in India currently around 41 million is expected to rise to 70 million by 2025. India & china makes major contribution of total diabetic patient load of world which is 75%. Complication of diabetes cardiovascular disease, retinopathy, nephropathy, and neuropathy makes the condition worsened. Autonomic neuropathy remains undiagnosed for years if not looked specifically by constellation of tests. The complication arising because of sympathetic dysfunction like dizziness, fainting, postural hypotension, erectile dysfunction hampers the life style of patient.^{I, II, III} In this study we assessed the sympathetic nervous system in diabetic patients and non diabetic using Ewing's battery test. We have also correlated the effect of duration of disease on sympathetic functions test in diabetic patients.

MATERIALS AND METHODS

After the permission of IRB committee, 500 study subjects were chosen from medicine outpatient department of Sir Takhtasinhji Hospital, Medical College Bhavnagar were divided into four groups, 3 groups of diabetic patient according to duration of disease & one group of control- non diabetic patients.

The diabetic group was subdivided in three groups according to duration of disease in Group I (0- 5 year), Group II (5- 10 year), Group III(10-15) year. Subjects in each group were examined and sympathetic nervous system's evaluation was done by instrument CANS analyzer -304 by Diabetic Foot Care India Pvt. Ltd. Subjects between 30 to 70 years of age were included. Subjects who did not give consent, hypertensive, suffering from disease that can cause sympathetic neuropathy (leprosy, alcoholic neuropathy, thyroid disorders) suffering from any other disease (HIV, TB, leprosy), taking any drug that can cause neuropathy all were excluded after taking proper history. Subjects with addiction like nicotine, alcohol were also excluded. We had taken all the precautions all the factors affecting sympathetic nervous system like sleep, food , drug, temperature can be avoided or matched in case & control. Sympathetic nervous system evaluation was done in every subject in morning between 9am to 11am only.^{IV,V,VI} Battery of following tests was performed by each subject.

1) Resting systolic & diastolic Blood Pressure (BP) (greater than or equal to 130 mmHg systolic BP and 85 mmHg of diastolic BP is considered abnormal or pre hypertensive). 2) Systolic and diastolic BP fall in response to standing (fall in SBP >20 mmHg and fall in DBP > 10 mmHg it is said orthostatic hypotension). 3) Rise in diastolic blood pressure in response to isometric exercise handgrip test (A value of more than 15mmHg rise in diastolic BP is taken as normal. Less than 10 mmHg rise in diastolic BP is taken as sympathetic insufficiency. 10 -15 mmHg is considered borderline.^{VII,IX,X}

OBSERVATION AND RESULTS

Statistical tools: We compared the outcome between the controls and each group of patients of diabetes mellitus using Graph Pad.com. Data were analyzed with same tool. We used Student's t-test for comparison. The level of significance was set at $P < 0.05$, and 95% confidence intervals.

TABLE 1 Sympathetic Function Test in controls and cases (groups according to duration of disease, groupI-0 to 5 year, groupII-6 to 10 year, group III- more than 10 year) (values are in mean and standard deviation)

Tests	controls	Group I(0-5 years)	Group II(5-10 years)	Group III(>10 years)
Resting SBP(mmHg)	117.48±10.94	121.35±10.58	129.12±14.25	132.85±15.35
P value		<0.05	<0.05	<0.05
T value		2.56	5.31	6.55
RDBP(mmHg)	73.84±7.48	76.71±8.01	83.10±10.00	87.44±10.72
P value		<0.05	<0.05	<0.05
T value		2.26	6.03	8.38
Fall in SBP on standing (mmHg)	5.15±4.78	5.30±4.67	9.06±6.60	10.32±7.75
P value		<0.05	<0.05	<0.05
T value		0.21	3.89	4.47
Fall in DBP on standing)	2.84±3.43	3.24±2.77	5.63±3.09	6.45±3.76
P value		0.38	<0.05	<0.05
T value		0.86	5.43	6.09
Rise in DBP on hand grip test (mmHg)	15.20±5.55	13.3±6.42	8.94±6.34	6.33±5.76
P value		<0.05	<0.05	<0.05
T value		2.05	4.22	7.31

DISCUSSION

Diabetes mellitus is a strong risk factor for cardiovascular disease. DAN is a risk factor that independently increases cardiovascular risk in people with diabetes mellitus. The present study indicates abnormal sympathetic function in diabetic group.

The reasons of neuropathy are metabolic insult to nerve fibers, neurovascular insufficiency, and autoimmune damage. Hyperglycemic activation of the polyol pathway may lead to accumulation of sorbitol and alteration in NAD: NADH ratio resulting in direct neuronal damage vasoconstrictor like protein kinas C gets activated and reduces neuronal blood flow. Vascular endothelium damage due to altered immunity & free radical production leads to vasoconstriction.^{xiii}

The autonomic nervous system regulates blood pressure (BP), heart rate, thermoregulation, respiration, gastrointestinal, bladder, and sexual function. Autonomic dysfunction can be due to many diseases that affect autonomic nervous system. The clinician's role is not just to seek out symptoms of autonomic imbalance, but it is then necessary to determine if these symptoms are really due to involvement of autonomic systems. In the past, methods to evaluate sympathetic nervous system were irreproducible, non specific & invasive. The interiors of rural India where specific set up is not available we need tests that can be performed with simple, small portable instruments & which give sensitive, specific, reliable & reproducible results. ^X That's why in these study we have focused on tests like Resting Blood pressure, Fall in BP while standing, Rise in BP on hand grip test because this test require simple set up only can be assessed by even health assistants. ^{VIII}

The control group Resting Systolic BP is 117.48 ± 10.94 mmHg. The mean value of resting systolic blood pressure is also increasing with duration of diabetes (group 1- mean value - 121.35 ± 10.58 mmHg, group 2- mean value - 129.12 ± 14.25 mmHg, group 3- mean value - 132.85 ± 15.35). The Resting Diastolic BP in control group were 73.84 ± 7.48 mmHg & in diabetics (Group 1- mean value 76.71 ± 8.01 mmHg , group 2- mean value 83.10 ± 10.00 mmHg, Group 3- 87.44 ± 10.72 mmHg) . As we can see comparison all diabetic case group with healthy controls show difference in BP is significant. One important cause is that dysfunction of the vascular endothelium causes cardiovascular diseases. ^{XIII}

The test called fall in Systolic BP & Diastolic BP on standing which is performed to assess postural hypotension was also performed. The mean of fall in Systolic Blood Pressure in control group was 5.15 ± 4.78 mmHg. The mean value of fall in systolic blood pressure also increases as duration of diseases increases (table 1 shows that group 1- mean value -5.30 ± 4.67 mmHg , group 2- mean value 9.06 ± 6.60 mmHg, group 3- mean value 10.32 ± 7.75 mm hg) . 2.84 ± 3.43 mmHg is fall in Diastolic BP on standing in controls. The mean value of fall in diastolic blood pressure also increases as duration of diseases increases (table 1 shows that group 1- mean value -3.24 ± 2.77 mmHg , group 2- mean value 5.63 ± 3.09 mmHg, group 3- 6.45 ± 3.76 mm hg) . As we can see comparison all diabetic case group with healthy controls show difference in BP is significant. These results also shows that fall in BP is increasing as duration of disease is increasing. The reason for postural hypotension is slowing of sympathetic vascular reflexes due to nerve damage. ^{XIII, XIV}

Table 1 shows that rise in BP after hand grip isometric test in controls is 15.20 ± 5.55 mmHg group 1- mean value - 13.3 ± 6.42 mmHg , group 2- mean value 8.94 ± 6.34 mmHg, group 3- mean value 6.33 ± 5.76 mm hg) . P value suggests that difference is significant.

In a study it was found that in patients with type II diabetes showed a decline in exercise induced pressure response in subjects with cardiac autonomic neuropathy. We analyze data of both group mean value of resting BP & fall in systolic blood pressure and diastolic blood pressure on standing both are higher in diabetic group. Mean value of rise in DBP on hand grip test is higher in controls. This result suggests altered sympathetic tone. These results indicate sympathetic dysfunctions because process of decrease in venous return is exaggerated vessels

are dilated due to decreased sympathetic tone. This may be due to damage to sympathetic nerves by diabetes. This result indicates impaired sympathetic functions in diabetics, as diastolic blood pressure is purely sympathetic function.^{xv, xvi} As we have discussed the resistance vessel which are responsible for maintaining diastolic blood pressure have only sympathetic nerve supply.^{xi} Table 1 shows sympathetic function tests are altered in diabetic patient than controls. Group 3 patients who have diabetes more than 10 years are at the most risk with worst scenario of morbidity. By comparing the results of three diabetic groups and correlating the results the final inference says that sympathetic neuropathy worsens as duration of disease increases.^{iv}

The recent study of Meyer M.F. shows that impaired vasomotion which is cumulative result of sympathetic dysfunction & vascular damage is early sign of diabetic neuropathy, precedes sensory neuropathy. So, diagnosing sympathetic neuropathy on early stage may help us to focus our treatment narratives on high risk patients who have more chances of prognosis.^{xi, xii}

CONCLUSION AND SUMMARY

Present study shows that there is significant difference in sympathetic function test in diabetic & normal persons. The results are indicating that there is sympathetic neuropathy in diabetics which is progressively increasing as duration of disease increases.

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5 ORIGINAL ARTICLE

DIAGNOSTIC COMPARISON OF ULTRASONOGRAPHY WITH MRCP IN CHOLANGIO PANCREATIC LESIONS

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ABSTRACT

OBJECTIVE :- To evaluate the diagnostic accuracy between USG &

MRCP in the patients suspected of biliary and pancreatic

Pathology.

MATERIAL & METHODS : Sixty patients of all age groups and both sexes, attending

the hospital, suspected of biliary and pancreatic pathology,

were examined first by USG and followed by MRCP. The

findings were co-related with ERCP and biopsy reports.

RESULTS :- Out of 60 patients, 41 patients had biliary pathology and 19 patients had pancreatic pathology. Out of this, MRCP was 98 % accurate in diagnosis when results were compared in all cases. USG didn't help in case of CBD stricture, in evaluating Pancreatic duct in case of Chronic pancreatitis and in lower end of CBD pathology.

CONCLUSION :- USG is the cheap and easily available modality so, it is the primary investigative modality for suspected patients of biliary and pancreatic pathology, but MRCP has high diagnostic value.

KEY WORDS :- Ultrasonography, MRCP (MRI).

INTRODUCTION:-

MRCP (magnetic resonance cholangiopancreatography) is emerging as an exciting tool for the non- invasive evaluation of the pancreatic and biliary duct system [I, II, III].

Non invasive imaging modalities such as Ultrasonography and CT Scan are often the primary imaging modalities in the evaluation of the biliary tree and pancreatic ducts [IV, V].

So, two noninvasive, non-radiation modalities for the evaluation of pancreatic and biliary duct system are USG & MRCP.

AIM :-

Comparison of diagnostic accuracy between USG and MRCP in the patients of suspected biliary and pancreatic pathology in

L.G Hospital, Ahmedabad, Gujarat from July 2015 to Dec 2016.

MATERIALS AND METHODS:-

Sixty patients of all age groups and both sexes of suspected biliary and pancreatic pathology were subjected to real time Ultrasonographic examination of biliary tree (IHBR, CHD, CBD, CYSTIC DUCT), GB and pancreas including Main Pancreatic Duct (GE Logiq P5, 4 to 11 MHz probes used for study), subsequently followed by MRCP (SIEMENS, 1.5 T machine was used for study). Results were compared with either ERCP or biopsy findings with histopathological reports and post-operative findings.

RESULTS:-

Comparison of diagnostic accuracy between USG & MRCP in the patients of suspected biliary pathology (Table no.1)

In our study, patients of biliary pathology especially stricture and mass lesions in lower part of CBD were better evaluated by MRCP.

In patients with Klatskin tumor, in which hepatic ducts were more involved, were better evaluated by MRCP. (Fig 3a & 3b)

Post-operative (cholecystectomy) strictures were better diagnosed by MRCP. (Fig 4a & 4b)

In all cases of chronic pancreatitis, calcification was better seen on Ultrasonography, but pancreatic duct dilatation, pancreatic duct irregularity, tortuosity and calculi in pancreatic duct were well demonstrated

only by MRCP.(Fig 5a & 5b)

Diagnosis	No. of cases	USG Dx accuracy	MRCP Dx accuracy
(A) Congenital Choledochal cyst	4 4	100 %	100 %

ERCP, histopathological reports and per and post-operative findings were compared. MRCP was 98% accurate in diagnosis of diseases. False negative result in one patient was due to technical problem. In this patient MRCP diagnosis was mass lesion in 2nd part of duodenum, but per-operation mass was in the head of pancreas.

(B) Duct Calculi	15		
In lower end of CBD	10	50 %	100 %
In mid part of CBD	1	100 %	100 %
In upper part of CBD	2	100 %	100 %
Gallbladder calculus with cholecystitis	2	100 %	100 %
(C) Stricture	3		
Benign	2	0 %	100 %
Post operative patients	1	0 %	100 %
(D) CBD Mass lesion (cholangio carcinoma)	11		
Klatskin tumor	6	100 %	100 %
Lower CBD mass	5	60 %	80 %
(E) Periapillary mass	7	85.6 %	71.4 %
(F) Gallbladder mass	1	100 %	100 %
Total	41		

TABLE II

TABLE II

PANCREATIC LESION	NO. OF CASES	USG accuracy	MRCP accuracy
ACUTE PANCREATITIS	2	50	100
CHRONIC PANCREATITIS	5	60	80
ACUTE ON CHRONIC PANCREATITIS	3	66	100
PSEUDOPANCREATIC CYST	5	100	100
HYDATID CYST	2	50	100
CA. HEAD OF PANCREAS	2	100	100
Total	19		

DISCUSSION:-

Two noninvasive, non-radiation modalities for evaluation of biliary & pancreatic pathologies are USG & MRCP.

Magnetic resonance cholangiopancreatography (MRCP) is a radiologic technique that produces images of the pancreaticobiliary tree that are similar in appearance to those obtained by invasive radiographic methods, such as endoscopic retrograde cholangiopancreatography (ERCP). The basic principle underlying MRCP is that body fluids, such as bile and pancreatic secretions, have high signal intensity on heavily T₂-weighted magnetic resonance sequences (i.e., they appear bright), whereas background tissues generate little signal (i.e., they appear dark) [VI].

Since its introduction by wallner et al in 1991[VII], MRCP has undergone tremendous technical changes essentially in the search for an optimal imaging sequence. In 1991 - wallner BK et al introduced MRCP which was used as a breath hold two dimensional, T-2 gradient echo sequence using steady state Free Precession (SSFP) [VII]. Marimoto improved image quality by introducing - 3D SSFP sequences [III]. Modified FSE sequences were introduced recently. These are the RARE (Rapid Acquisition with Rapid Enhancement Sequence) and HASTE (Half Fourier Acquisition Single Shot Turbo Spin Echo Sequences). So, now HASTE & RARE sequences are ideal cholangiographic sequences for MRCP and a combination of HASTE & RARE takes only 10 minutes imaging time

[VIII].

Currently, diagnostic accuracy of MRCP is considered to be equivalent to ERCP for a broad spectrum of benign and malignant pancreatic & biliary diseases [IX].

Ultrasonography has limitation especially in the evaluation of distal CBD where bowel gas, debris/ fluid in the duodenum and obesity can degrade the image quality [IV, V]. Other imaging modalities are invasive, hence MRCP is an excellent modality for evaluation of biliary and pancreatic diseases.

Meta-analysis including 60 patients study shows that MRCP is 97% sensitive & 98% specific for defining the biliary tract obstruction [X]. The overall sensitivity, specificity and accuracy of MRCP in the detection of bile duct lesions were 97%, 98% and 97%, respectively [XI].

Specificity for detecting chronic pancreatitis was 99% [XII].

Results of studies show clearly that USG is not able to diagnose cases of stricture, mass lesion and calculi in lower end of CBD.

CONCLUSION:-

In the patients of suspected biliary and pancreatic pathology, USG is the primary imaging modality of choice, but it has very less diagnostic accuracy in evaluation of benign, malignant stricture of lower

end of CBD, calculi in lower end of CBD, congenital anatomical variants, post-operative biliary tree anatomy and pathology.

So, MRCP based on heavily T-2 weighted images (HASTE & RARE sequences) produces remarkable increased contrast between stagnant fluid (bile) and background (abdominal fat, hepatic, pancreatic parenchyma) has almost 100% diagnostic accuracy.

So, all patients having biliary and pancreatic pathology, not clearly diagnosed by USG must be evaluated by MRCP for diagnostic accuracy.

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LEGENDS:

FIGURE 1a :- USG - CBD is dilated upto lower end, calculi could not be not seen.

FIGURE 1b :- MRCP - CBD is dilated upto lower end, calculi seen at distal end.

FIGURE 2a :- USG - Markedly dilated CBD upto lower end, cause could not be evaluated.

FIGURE 2b :- MRCP - Markedly dilated CBD upto lower end, malignant stricture at lower end by mass in lower end of CBD.

FIGURE 3a :- USG - Markedly dilated both hepatic ducts and IHBR, Common Hepatic Duct not seen-suggestive of Klatskin tumor.

FIGURE 3b :- MRCP - Right Hepatic duct is more dilated than left hepatic duct suggestive of right hepatic duct is more involved in Klatskin tumor than left hepatic duct.

FIGURE 4a :- USG - Dilated Common Hepatic duct, Gall Bladder not Seen, history of cholecystectomy before two month, CBD not seen.

FIGURE 4b :- MRCP - Post –operative (cholecystectomy) stricture at lower end of Common Hepatic Duct.

FIGURE 5a :- USG - Pancreatic calcification is better seen in chronic pancreatitis.

FIGURE 5b :- MRCP - Main pancreatic duct and its branches are irregular, tortuous and dilated.

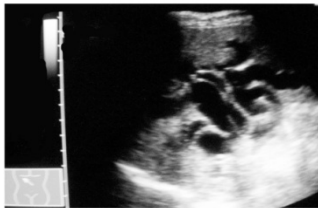


Fig 3a

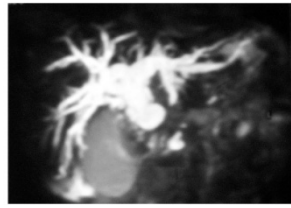


Fig 2b

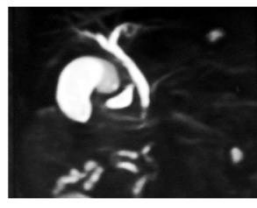


Fig 1b



Fig. 1a

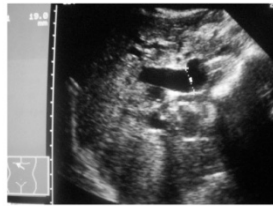


Fig 2a

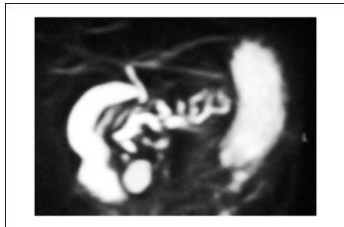


Fig 5b

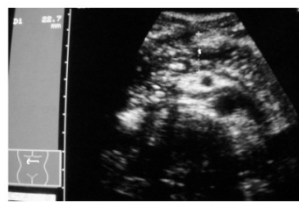


Fig 5a

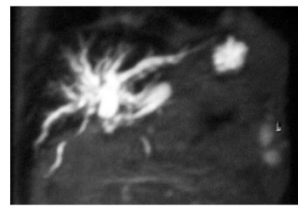


Fig 4b

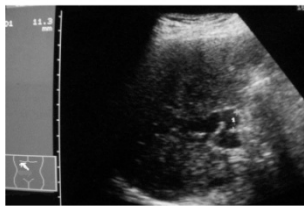
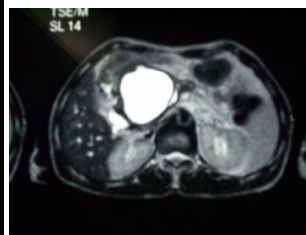


Fig 4a



Fig 3b



MRCP pseudo pancreatic cyst

6 original article**“ARE ELECTROMAGNETIC FIELD RADIATION TARGETS BLOOD CELLS?”****Dr. Rajendra V. Joshi* & Dr. H.D. Khanna******* Lecturer (Biophysics), Physiology Department, SMIMER Medical College, Surat******Emeritus Professor and Head, Department of Biophysics, IMS, BHU, Varanasi.**

ABSTRACT

In world of globalization is very difficult not to have technology. But with technology, come certain hazards. The only way to beat these is again, better technology. A cell phone technology is a best example of electromagnetic radiation, which introduce in India few years back, but now its need of society. It also works on electromagnetic radiation. The development of wireless communication systems has given rise to concerns about the potential human health hazards of increased and chronic exposure to electromagnetic field (EMF) and radio frequency (RF) radiation. The aim of this study is to evaluate whether the frequent exposures of electromagnetic field radiation targets the blood cells in human being.

The present study was conducted over a period of three years (2009-2012), which covers urban as well as rural areas of Surat districts. It was under taken in 114 subjects, including control group. The study includes anthropometric parameters (like Height, Weight, BMI), Clinical examination (like Pulse rate, base-line blood pressure etc.) and haematological tests (like blood count, blood indices and blood pictures) in various groups. Ethical approval and other aspects were taken into consideration. The blood tests were performed in all the 114 apparently healthy subjects. The data obtained was tabulated with respect to various parameters and was statistically analysed.

Although radiation exposures due to mobile phone and base station are very low, but once the energy is absorbed by the biological matter can cause severe and long lasting damage to human health. It might take years for the damage to produce noticeable symptoms. According to that we performed the study and we found the changes accordingly. In our study, haematological analysis shows that blood parameters were within the range, some of the parameter might increase or decrease as compared to control group but some of the alarming situations were sparking like 'rolls of coins' in RBC's which raises the risk of thrombosis or transport of oxygen, change in reticulocyte count may tells about bone marrow activity and so on. Based on this, we would like to conclude that the persistent & prolonged exposure under the cellular mobile phone & cellular phone base station is a risk factor.

INTRODUCTION

In today's world of globalization new technologies are growing up for benefit of human being. A wireless technology is one of them, which is developing rapidly and spreading dense network around us. A cell phone technology is one of them, which introduce in India few years back, but now its use is an essential part of business, commerce and society. Like mobile phone more

and more wireless communication services are expected to come up which works on electromagnetic radiation and it seems that there is no way to reverse this trend.

A mobile/cellular phone and mobile/cellular base station is a low-power radio(s), mobile phone act as a single-channel, two-way radio and on the other hand mobile/cellular base station are multi-channel two-way radio. They produce radio-frequency (RF) energy for the communication purpose (that's how they communicate), and along with communication they expose people near them. Around the world a variety of frequencies are used for mobile phones [Stuchly, 1998] and mobile phone base station. The interaction of that electromagnetic energy with biological material (like cells, laboratory animals or humans) depends on the frequency of the source [Foster, 1997], and most common frequencies for mobile phones are 800-900 MHz.

According to Adair [1994] the RF energy absorbed by humans may be less because the phones are low power and the RF energy emitted from them are generally very low. Although exposures are very low, but once the energy (thermal and non thermal) is absorbed by the biological matter, it can cause long lasting damage to it. It might take years for the damage to produce noticeable symptoms but harmful changes are manifest.

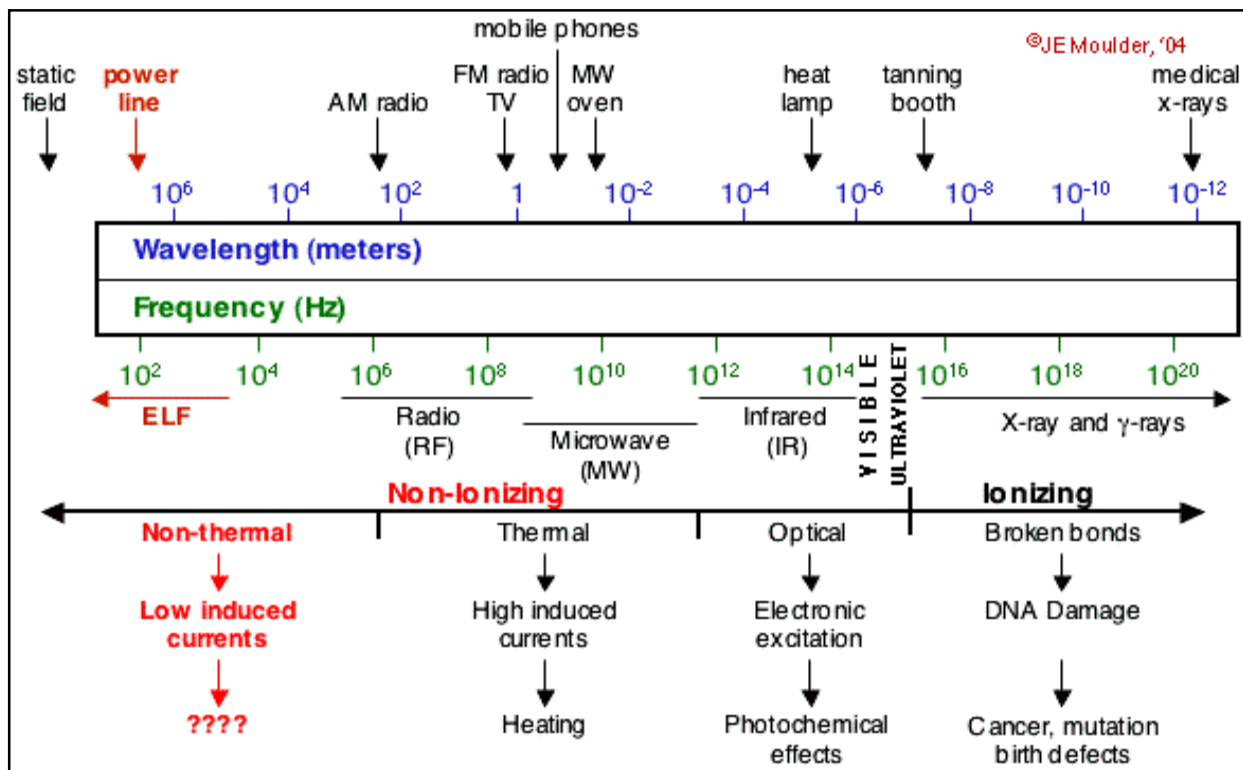


Figure 1: The Electromagnetic (EM) Spectrum

In the print and electronic media we can repeatedly observing the dreadful stories regarding mobile phone and its base station, the exposure form them has been accompanied by public debate on the possible adverse effects on human health. As people use cell phones to make calls, signals are transmitted back and forth to the base station. The RF waves produced at the

base station are given off into the environment, whenever people send or receive the call they can be exposed to them.

Now a days the mobile base stations are mounted on the top of the building invariably. The people living on the top floor are close to the antenna so there are more chances to exposure to the energy emitted by antenna. The RF energy absorbed by humans may be less because both the phones and the base stations are low power, the RF energy emitted from them are generally very low [Adair, 1994], but once the energy is absorbed by the biological matter, due to persistent use or frequent exposure to source can cause damage to human health. Therefore, the aim of the present study is “Are Electromagnetic Field Radiation Targets Blood Cells?”

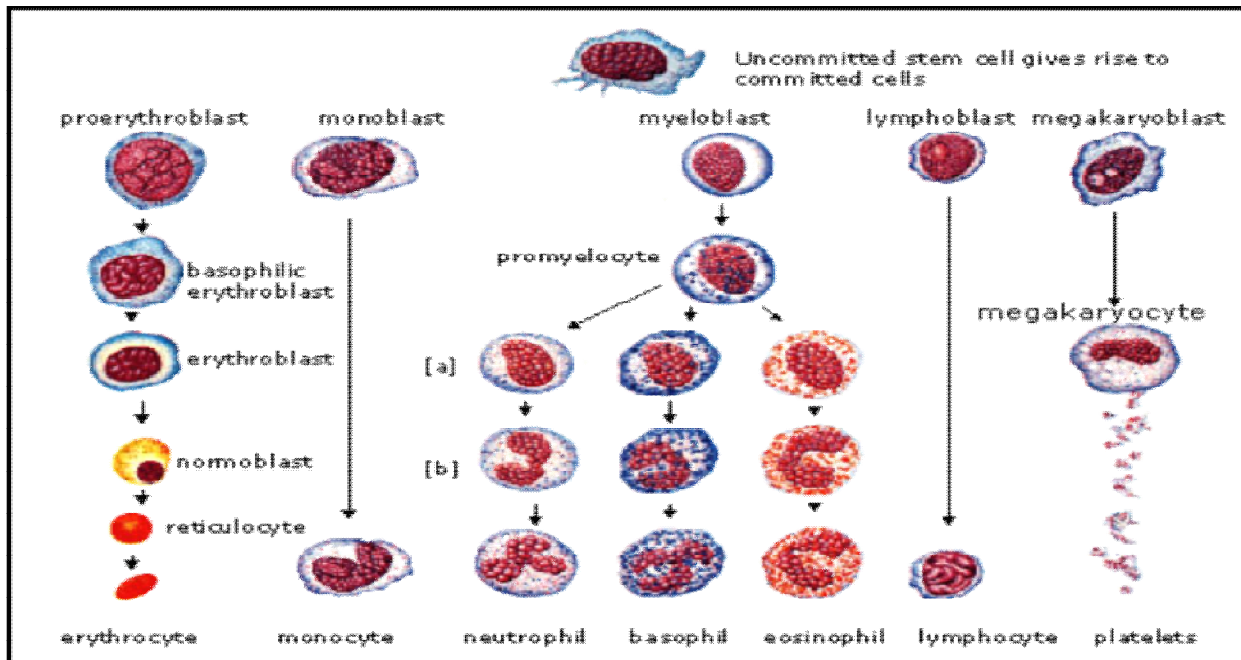


Figure 2: Formation of blood cells

AIMS & OBJECTIVE

Electromagnetic field radiation emitted by mobile/cell phone is targets blood cells in human being.

MATERIAL AND METHODS

The present study was conducted over a period of three years. This covers urban as well as rural areas of Surat districts. In the present study, a total of 114 subjects were invited. The protocol was explained to the subjects, who volunteered for the present study and written informed consent was obtained from each of the participant. The sample was predominantly male with age ranging from 18-42 years were participated in this study.

Selection of Study Group

Healthy normal subjects i.e. control group (Group-I) were selected who were neither users of mobile phone nor exposed to radiations emitted from the base station as a control group. From randomly chosen registries were matched to the study group and it was approximately mirror

image of the age and education distribution of the included cases, as to increase efficacy in the analyses.

Selection of Mobile phone users

Mobile users (Group-II) were specified and selected for the study based on inspection of the local conditions. In that, at the time of first meeting with them we adjusted the new call time by call manager setting and after six days we calculated the average mobile operating time. The persons were identified who had fulfilled the following basic requirements:

- a. The mobile user must have been using his phone for more than 25 hrs/month.
- b. The mobile user must have been operating the mobile phone for at least one or more than one year.

Selection of base station residents

The network providers were identified in the residential regions where the persons were residing (Group-III) that fulfilled the following requirements:

- a. The antenna must have been operating and the person is residing in the area for not less than one year.
- b. The distance of the base station from the place of residence was not more than 25 feet or 8 meters.
- c. There was no other base station nearby (this could only be achieved in rural areas)

Twenty one base stations were specified, from which 11 were selected for the study based on inspection of the local conditions.

Selection of Combination of Group II & III

In this group (Group-IV) we selected subjects who were fulfilling the criteria mentioned for group II & III, i.e. those who were using mobile phone for more than 25 hrs / month and residing not more than 25 feet or 8 meters away from antenna, from the last one or more than one year.

Data Collection and measurements

After a 12-hours fast of the previous night, participants provided blood samples that were collected in vacuum vials with EDTA anti-coagulant and samples were analyzed for the various hematological test like white blood cell count (TLC), differential leukocyte count, platelet count, total red cell count (RBC), hemoglobin estimation, haematocrit (Hct) and the microscopic examination of blood. Ethical approval (letter no. GMC's/Stu./18796–108 dated: 05/09/2008) and other aspects were taken into consideration while planning the experiments.

Subjects having any systemic illness, neuropsychiatric disorder, cognitive disorder, and / or receiving psychotropic medication were excluded from all the study. The analysis was performed by using Statistical Package for Social Sciences (SPSS) software version 17 for windows.

OBSERVATION & RESULTS

Table: 1: Comparison of Hemoglobin (gm %)

Group	Control	Mobile User	Base Station Resi.	RBMU
At Start	14.16	14.10	14.36	14.15
After 1 Year	14.23	13.88	14.16	13.77

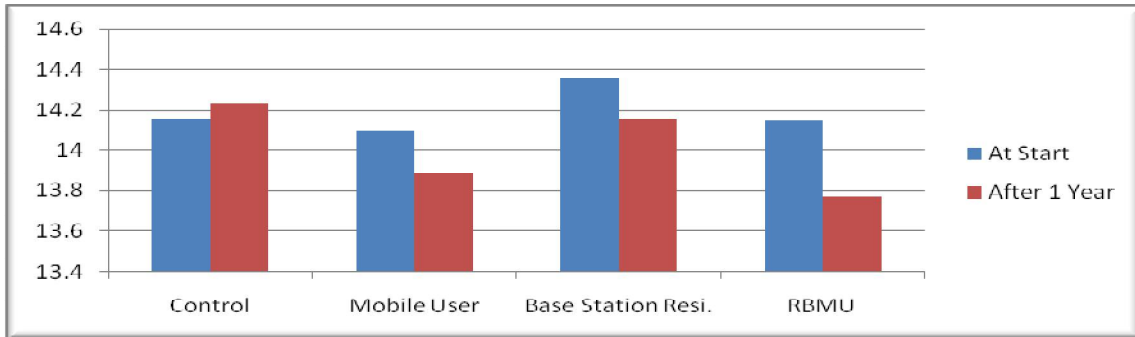


Table: 2: Comparison of Pack cell volume

Group	Control	Mobile User	Base Station Resi.	RBMU
At Start	41.62	41.75	41.19	40.92
After 1 Year	41.06	40.89	40.91	40.42

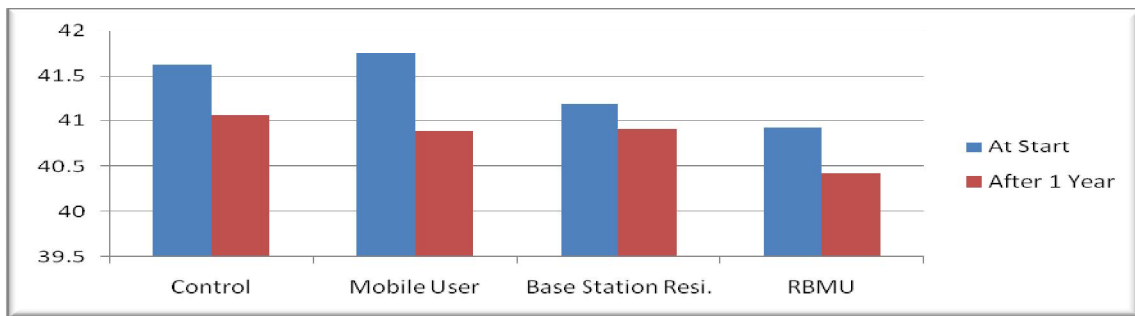


Table: 3: Comparison of Total WBC (cell/cu. mm)

Group	Control	Mobile User	Base Station Resi.	RBMU
At Start	7689.71	7909.72	7632.81	8358.33
After 1 Year	8067.65	7902.78	7998.44	8258.33

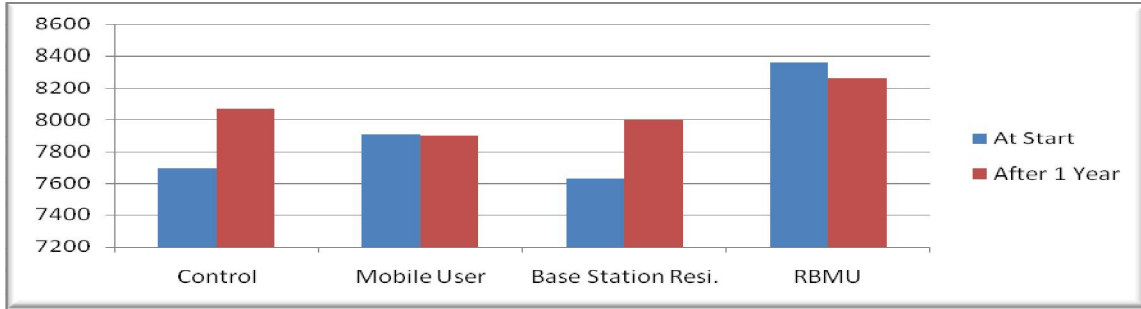


Table: 4: Comparison of Platelets (lacs/cu.mm)

Group	Control	Mobile User	Base Station Resi.	RBMU
At Start	4.34	4.39	4.30	4.08
After 1 Year	3.96	4.08	4.02	3.94

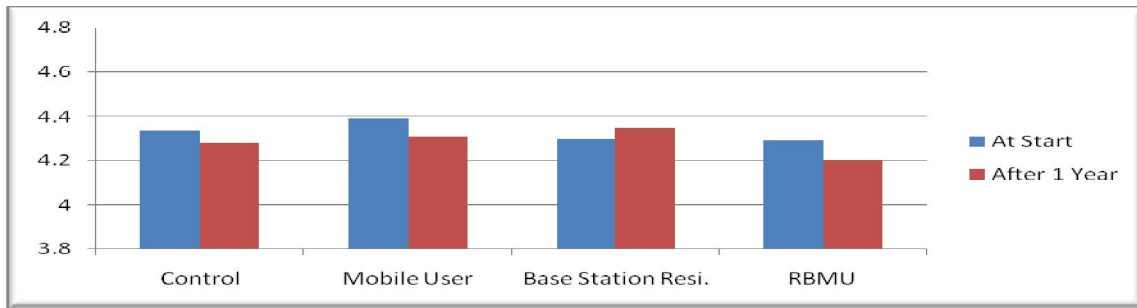
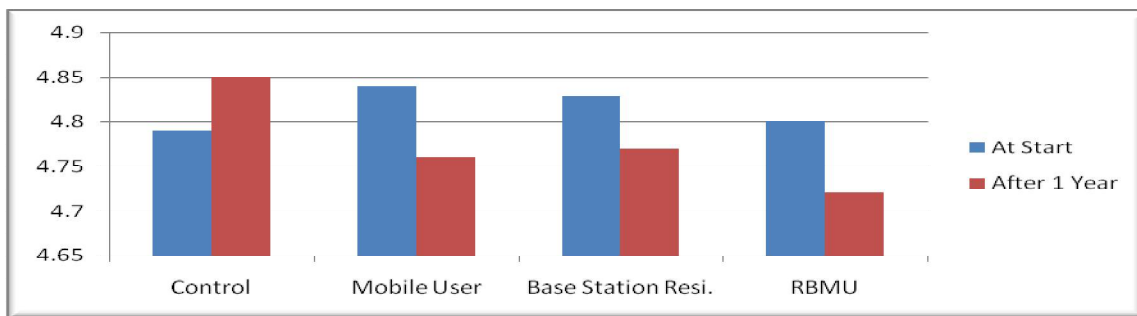
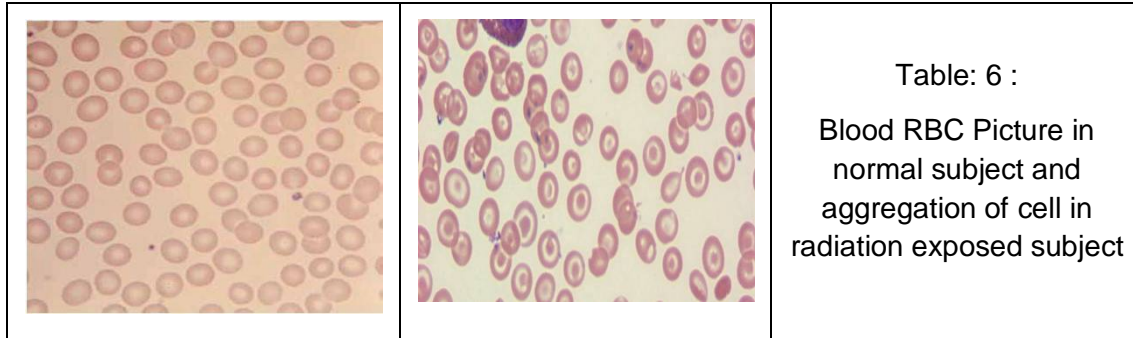


Table: 5: Comparison of Red Blood Corpuscles (million/cu.mm)

Group	Control	Mobile User	Base Station Resi.	RBMU
At Start	4.79	4.84	4.83	4.80
After 1 Year	4.85	4.76	4.77	4.72





The hemoglobin, pack cell volume and red blood corpuscles (RBC) values are decreased with prolonged exposure. Whereas the total WBC count value are not shown any pattern so we cannot predict whether values are increased or decreased. But the situation gets change when we observe the blood picture before and after the exposure, before exposure blood picture shows cells are separated and after exposure it shows aggregation of cells (rolls of coins) may be because of the cells loses its polarity and integrity. Once its start aggregating at one place its surface area will reduce and it results in hypoxia or cells are not that capable to providing sufficient amount of oxygen to the body organ like brain. Even in case of RBC count value is not increased but slightly increased reticulocyte count value shows effects of exposure on bone marrow activity. Secondly this change in polarity and integrity of aggregated cells (rolls of coins) will also increase the risk of thrombosis, which is another alarming situation.

SUMMARY & CONCLUSION

Although radiation exposures due to mobile phone and base station are very low, but once the energy is absorbed by the biological matter can cause severe and long lasting damage to human health. It might take years for the damage to produce noticeable symptoms. According to that we performed the study and we found that, the haematological analysis shows that blood parameters were within the range, some of the parameter might increase or decrease as compared to control group but all the changes in the physiological limit only as the normal value range in blood count is very vast on the basis of changes what we got will not able to highlight the effect but some of the alarming situations were sparking like 'rolls of coins' in RBC's which raises the risk of thrombosis or transport of oxygen, change in reticulocyte count may tells about bone marrow activity and so on. Based on this, we would like to conclude that the persistent & prolonged exposure under the cellular mobile phone & cellular phone base station is a risk factor.

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7 Original article

COMPARATIVE STUDY OF DROTAVERINE HYDROCHLORIDE AND VALETHAMATE BROMIDE IN RATE OF CERVICAL DILATATION

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ABSTRACT

OBJECTIVE:

To evaluate and compare the effects of drotaverine and valethamate on cervical dilatation.

METHODS:

This was a prospective study conducted in a tertiary center over a span of 6 months. 90 patients were randomly allotted in 3 groups.

1. 30 patients (15 primigravida and 15 multigravida)- control group
 2. 30 patients (15 primigravida and 15 multigravida) – Injection Drotaverine
 3. 30 patients (15 primigravida and 15 multigravida) – Injection Valethamate
- The drotaverine (D) and valethamate (V) groups were given intravenously 40 mg drotaverine hydrochloride to group D with every 2 hours for a maximum of 3 doses 8 mg valethamate bromide to group V with maximum of 3 doses one hour apart. The control group given 2ml inj. normal saline intravenously as placebo.

RESULTS:

In primigravidae and multigravidae the average duration of active phase is shortened by 3 hours with 2.9+1cm/ hour cervical dilatation in drotaverine group and 1 hour 45 minutes with 1.9+1.1cm/hour in valethamate group (p-value <0.05). There was no significant difference in the duration of second and third stages in both groups. No obstetrical complications or major side effects observed in both groups.

CONCLUSION:

Drotaverine accelerates labor better than of valethamae. The reduction of pain during labor is better with drotaverine when compared with valethamate.

KEY WORDS : Drotaverine, Velathamate, labor, cervical dilatation

INTRODUCTION:

In the era of 4G network and digitalization , every one wants delivery in the shortest possible time without compromising the maternal and fetous safety is beneficial for both obstetritian and the laboring woman. Labor is a multifactorial process involving good myometrial contractions, cervical ripening, dilatation and expulsion of the fetus and the placenta in an orderly manner. Various drugs are available to curtail the duration of labor e.g.: hyoscine – N- butylbromide, drotaverine and valethamate bromide. There has been an upsurge in use of these cervical dilators to avoid the complications of prolonged labor. along with early amniotomy and early administration of oxytocin, to accelerate labor many advise the use of antispasmodic agents like drotaverine, hyoscine butylbromide, dicyclomine valethamide bromide, etc. to hasten the first stage of labor.(18)

AIMS AND OBJECTIVE

1. To compare the duration of active 1st stage of labour in control group , group D and group V.
2. To compare pain

METHODS:

This was a prospective study conducted in a tertiary center over a span of 6 months. 90 patients were randomly allotted in 3 groups.

1. 30 patients (15 primigravida and 15 multigravida)- control group
2. 30 patients (15 primigravida and 15 multigravida) – Injection Drotaverine
3. 30 patients (15 primigravida and 15 multigravida) – Injection Valethamate

Criteria for inclusion in study

1. Period of gestation > 28 weeks
2. Primigravida and multigravida
3. Spontaneous onset of labor
4. Patient in active phase of labor with well established uterine contractions and cervical dilatation 3 cm
5. Vertex presentation
6. Single live fetus
7. No cephalopelvic disproportion

Criteria for exclusion from study

1. Non cephalic presentation
2. Multiple pregnancy
3. Known hypersensitivity to Drotaverine or Valethamate bromide
4. Trial of labor

The patients fulfilling the above criteria were included in the study. An informed written consent was obtained from all the mothers and were divided into 2 groups.

Group D (Drotaverine group): Patients in this group were given injection Drotaverine 40 mg (2ml)

intramuscularly at 3 cm dilatation of cervix. Dose was repeated at an interval of 2 hours till full dilatation of cervix. Maximum of 3 doses were given.

Group V (Velathamate group): Patient in this group were given injection Velathamate 8 mg intramuscular at 3 cm dilatation of cervix. Dose was repeated at an interval of 1 hour till full dilatation of cervix. Maximum of 3 doses were given.

Group C (Control group): This group included 30 patients and no drug was given.

Details of the mothers were recorded on a prestructured proforma which include detail history of present pregnancy, menstrual history, obstetric history and any significant past history were recorded. Complete general and systemic examination was done and findings were recorded. Obstetrical examination including fundal grip, lateral grip, first and second pelvic grip were done to ascertain the number of fetus, lie and presentation.

Time of injection: Injection drotaverine and velathamate was given to the mothers belonging to respected group after initial assessment. Progress of labor was assessed by per abdominal examination and per vaginal examination. The progress of labour was assessed by cervical dilatation, duration of first stage, duration of second and third stage and maternal side effects of drugs and complications if any noted. The data of the study was tabulated and statistical analysis was done and both drugs were compared for their efficacy, side effects along with control group.

RESULTS

TABLE 1:

DEMOGRAPHIC PROFILE				
DEMOGRAPHIC VARIABLE	GROUP D	GROUP V	GROUP C	P VALUE
AGE(years)	24.3 + 1.6	24.2+1.8	24.4+1.5	>0.05
GESTATIONAL AGE(weeks)	38.2+1.1	38.3+1.1	38.2+1.1	>0.05
PRIMI GRAVIDA	15	15	15	
MULTI GRAVIDA	15	15	15	
INITIAL CERVICAL DILATATION(cm)	3.6+0.5	3.6+0.5	3.6+0.4	

It was observed that 97% patient were of age group between 19 to 30 years and 2% were in between 31 to 35 years in the whole study group. They are distributed in the three groups in the manner that average age in each group remains same and that factor would be statistically insignificant.

In all the three groups primi and multi gravida were divided equally. Gestational age wise distribution shows that maximum 92 % patient were 37 to 40 weeks in all groups. And 8 % patients had 41 to 42 weeks gestation period.

TABLE 2:

LABOUR DURATION				
	GROUP D	GROUP V	GROUP C	P VALUE
TOTAL DURATION OF LABOUR (MIN)	187.8+49.6	220+52.3	321.9+56.4	>0.05
DURATION OF 1 ST STAGE(MIN)	145.3+19.7	179.6+24.2	289.7+36.3	>0.05
DURATION OF 2 ND STAGE(MIN)	28.9+10.2	29.4+10.4	30.4+10.9	>0.05
DURATION OF 3RD STAGE(MIN)	9.1+2.1	9.6+2.3	8.9+19	>0.05
RATE OF CERVICAL DILATATION(CM/HR)	2.9+1.0	1.9+1.1	1.7+0.5	<0.05

In group D 16 patient received only 1 injection, 9 patient received 2 injection and 5 patient received 3 injections. In the group V ,7 patient received 1 injections, 14 patient received 2 injections and 9 patient received 3 injections. It was seen that mean rate of cervical dilatation was 1.7 cm/hr in the control group,1.9 cm/hr in the valethamate group and in the drotaverine group rate of cervical dilatation was 2.9 cm/hr.

It is evident from the table that the difference in the rate of dilatation is significant. The mean duration of active phase of 1st Stage of labour was more in control group(289.7+36.3) followed by was Valethamate (179.6+24.2) and Drotaverine group (145.3+19.7). Mean duration of 2nd stage of labour was 30.4,29.4,28.9 minutes in control, Valethamate and Drotaverine group. 3rd stage had mean duration almost same in all the three groups.

TABLE 3:

Mode of delivery	No. of patients		
	GROUP D(N=30)	GROUP V(N=30)	GROUP C(N=30)
NORMAL	27(90%)	26(86.67%)	27(90.5%)
INSTRUMENTAL	1(3.33%)	2(6.67%)	2(6.67%)
LSCS	2(6.67%)	2(6.67%)	1(3.33%)

TABLE 4:

Side effects	No. of patients		
	Group D (N=30)	Group v (N=30)	Group v (N=30)
MATERNAL TACHYCARDIA	1	0	0
FETAL TACHYCARDIA	1	1	0
NAUSEA/VOMITING	2	1	0
FLUSHING	3	0	0
FETAL DISTRESS	3	2	2
PROLONGED 2 ND STAGE OF LABOUR	1	1	1
VAGINAL TEAR	1	1	1

Among valethamate group 86.67% patient were delivered by full term normal delivery with Episiotomy while 6.67% delivered by forceps. It was found that out of those patients in Drotaverine group 90% delivered by full term Normal delivery with episiotomy and 1% by forceps delivery. In control group 8% had cervical tear. In valethamate group 28% had tachycardia, 8% had headache and 12% had dryness of mouth. While in Drotaverine group 12% had tachycardia and 6% had headache.

DISCUSSION

The mean age in control group was of 24.4+1.5 years while 24.2+1.8 and 24.3+1.6 years of those in Valethamate and Drotaverine group respectively. In a study conducted by Tripti N and Jyoti J (2009)20 mean age in Valethamate group was 23.25 years and in Drotaverine group mean age was 22.76 while In another study by Thapa M, *et al*(2007)19 mean age in valethamate group was 23.3 years and in Drotaverine group was 22.8years. Gestational age wise distribution shows that Maximum i.e. 92% patients were 37 to 40 weeks of gestation in control group and Drotaverine group

respectively. Only 8% patients had 41 to 42 weeks gestation period in control group and Drotaverine group. The findings were consistent with the findings reported by Tripti N and Jyoti J(2009)²⁰ and Thapa M, *et al*/¹⁹. Overall the rate of cervical dilatation in control group was 1.7cm/hr, in Valethamate group was 1.9cm/hr and in Drotaverine group was 2.9 cm/hr. Sharma JB, *et al*(2001)¹⁷ and Mishra SL, *et al* (2002)¹² also observed similar rate of cervical dilation in Valethamate Drotaverine group in their study. However Tripti N and Jyoti J(2009)²⁰ observed higher rate of cervical dilatation in their study. Thus the rate of cervical dilatation was higher in drotaverine group as compared to control and Valethamate group. Duration of active phase of 1st stage in Valethamate group was 179.6+24.2mins, in Drotaverine group it was 145.3+1.7mins and in control group it was 289.7+3.6mins. Tripti N and Jyoti J(2009)²⁰ observe that the duration of active phase of 1st stage in Valethamate group was 177.4 minutes and in Drotaverine group was 113.5minutes. Which was comparable with the present study Mean duration of second stage in Valethamate group was 27.4minutes, in Drotaverine group was 28 minutes and in control group was 30.4 minutes. It is comparable with the study done by Tripti N and Jyoti J(2009)²⁰ there was no significant difference in second stage of labor. In another study by Madhu C, *et al*(2009)²² also, there was no significant difference in second stage of labor. There was no significant reduction in the duration of third stage of labor in Valethamate group and Drotaverine group as compared to control group. In study done by Tripti N and Jyoti J (2009)¹⁸ and another study by Madhu C, *et al* (2009)¹¹ there was no significant difference in third stage of labor. In control group 8% mothers had cervical tear. In valethamate group 28% had tachycardia, 8% had headache and 12% had dryness of mouth. While in Drotaverine group 12% had tachycardia and 6% had headache. Tripti N and Jyoti J(2009)²⁰ observed adverse effects like tachycardia and dryness of mouth which was more commonly associated with valethamate group compared to drotaverine group. In study by Madhu C, *et al* (2010)¹¹ noted transient side effects of tachycardia, flushing of face and dryness of mouth in valethamate group. In drotaverine group headache was noted. The outcome of delivery was similar in all the three groups. And no statistical significant difference was observed. Tripti N and Jyoti J (2009)²⁰ also reported no significant difference in neonatal outcome. In this study, we found that Drotaverine effect on shortening duration of labour was significantly better than Valethamate bromide with lesser side effects.

CONCLUSION

Thus from the above results and discussion we conclude that effect of Drotaverine on shortening duration of labour is significantly better than Valethamate with fewer side effects. Thus Drotaverine is a safe, potent and effective drug to shorten the first stage of labour.

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8 original article**ASSESSMENT OF SELECTED CARDIOVASCULAR PARAMETERS IN ELDERLY
POPULATION OF VADODARA.****DR.U.I.BHATT¹, DR.J.M.HARSODA²**

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Corresponding Author:EMAIL ID-upendrarabhatt1946@gmail.com.**ABSTRACT**

INTRODUCTION: India is an aging nation and we are having presently around 8.0-8.5% aged population who are inadequately studied for their gerontology norms and exposed to limited health care due to reasons. Vadodara is a city in central Gujarat with large population of elderly persons. Their organizations are also active. **MATERIAL AND METHODS:** We studied 60 elderly participants in age arrange of 60-80+; 30 males and 30 females of middle class, staying for more than 5years in urban milieu in community, in different pockets of Vadodara city. Careful history, clinical examination of relevance, demographic parameters , resting heart rate, resting blood pressure, pulse oxymetry, and single time ECG tracings in resting state of all twelve classic leads were determined. **OBSERVATIONS AND RESULTS:** Findings are presented in graphs and tables. The demographic parameters are within /around range of other urban individuals in surrounding regions, ECG showed P wave features, and ventricular features [quite less common in our study] as shown in tables, HR and SBP/DBP/PP/MAP were in accordance to expectation and correlate well with age characteristics. **CONCLUSION:** We conclude that the demographic parameters of elderly of Vadodara we studied, are within range of normal uncomplicated aging individual and for ECG findings, the features correlate well with observations of investigators in past and present. at home or abroad.

KEY WORDS: Elderly, Demographic, Pulse-oxymetry, Blood Pressure, Electrocardiography

INTRODUCTION

Aging of human beings is a universal phenomenon.

It is stated that a generally agreed on panel of biomarkers has yet to emerge, so currently, it is impossible to quantitate aging.¹

It is also noted²that, elderly people after retirement at sixty five years, become more liable to infection of respiratory tract, cardiovascular disorders and malignant diseases.

In world over³, and also in India the aging population is increasing. This is due to recent and continuous health care advances, and due to which birth rate would not fall further but life expectancy will increase.

India is labeled as country with aging population.

For long, it is stated that with advancing age significant reduction in functional capacities occur in many different organ systems. Such changes are documented by authors.⁴

Cardiovascular changes in elderly population are well documented by authorities.^{5,6,7}

Paul White⁸has stated by study of 1251 consecutive autopsies that cause of death in eighties was 64 % due to cardiovascular disease.

As these studies were done, either fairly in past, or on population of different ethnic or racial groups there is apparent need for fresh assessment, with Indian population.

Vadodara, [msl-129mt; 22.30⁰-N;18.70-E;with Av.Humidity-40%] located in region of central Gujarat, is a essentially city of service class people, probably due to large number of industries around. It has reasonably better ambience with moderate climate, tranquility, greenery and fairly advanced health care infrastructure. As such, it is one of the preferred places of elderly citizens during the retirement phase of life. Various centers and senior citizen associations are active in this city.

It is therefore apt to assess and determine the bio-gerontologic characteristics of this large population. This study of 60 elderly citizens is done to add and enrich similar database of study of the population by medically approved methods and equipments which can assist in establishing the approved reference values of these parameters more precisely. Indeed there is paucity of standardized norms in this age group at home.

MATERIAL AND METHODS

We studied the mentioned parameters in community dwelling 30 male and 30 female apparently healthy participants of age of 60 years, and above, who were judged suitable by given panel of criteria.

It was not deemed necessary to compare with healthy young population as, these parameters may be influenced by individual intrinsic and extrinsic milieu and as such, may be variable from time to time; still however an attempt is made to assess the profiles in background studies at home in past, also of recent studies by expert gerontologists in India, and abroad.

The study was proposed to, and consented by the IEC [Institutional Ethical Committee]. The participants of age group of 60 years and above, males and females were examined by single time qualitative and quantitative assessment, by careful history taking and medically approved equipments of precision which can objectively assess the values [to exclude personal factor of errors]. The participants were acquainted to program, encouraged to ask relevant questions, and consent for participation taken. General physical examination and systemic examination was undertaken by qualified doctor. Due care for the human dignity, comfort, and privacy was exercised. The examinations were done in well equipped trust private hospital, in societies of participant residents or in Karlelibaug senior citizen centre premises. In case of lady participant, the ECG was taken by trained and qualified female nurses in privacy. As many cardiovascular parameters are related to demographic values main demographic parameters like Weight [in Kg.], Height [in Cm.] and BMI[Body Mass Index] were also examined. ECG assessment was done by CLARITY AUTOMATIC 12 LEAD ECG Equipment[ISO-9001Company] Electrocardiograph machine was standardized [built in uniform low voltage power supply for safety, and required no earthing. The equipment gave automatic read out of presented parameters digitally.]

Blood pressure was assessed by OMRON DIGITAL Equipment [Omron Health Care Inc. Kyoto, Japan], in sitting position after adequate physical and mental rest.[5 minutes][Resting Blood Pressure Values]

S PO₂ [Saturation of partial pressure of oxygen] was assessed by OMRON PULSE OXIMETER,[Company make as above], giving the values digitally along with Pulse Wave Tracing, And Heart Rate.

INCLUSION CRITERIA

- The elderly individuals of either sex, with age above 60 years, residing in Vadodara for not less than 5 years,
- They have given consent for this study.

- Apparently healthy. No major hospitalization, heart problem, or operation, or life supported by heart prosthesis, stent, pace maker device or drugs influencing cardio respiratory mechanisms.
- No abnormal profiles of heart-lung-blood related biochemical or pathological nature..

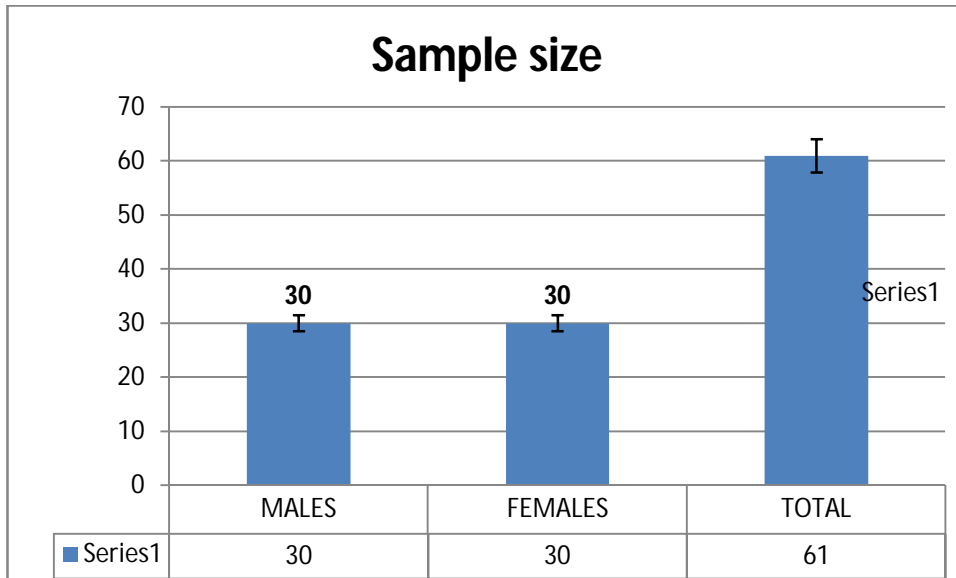
EXCLUSION CRITERIA

- Those who have any acute or chronic illness related to respiratory, cardiovascular or hematologic nature which can affect the study.
- Have any history of major hospitalization or Cardiovascular system related operation like CABG [Coronary Artery Bypass Graft] /STENT/IMPLANT/PACEMAKER etc.
- Who have any major constitutional illness like Diabetes, Hypertension, Tuberculosis, Severe Anemia Etc., or taking drugs for it.
- Who do not give consent.

OBSERVATIONS

- Following parameters were assessed:
 - Age, Height, Weight, Body Mass Index, Resting Blood Pressure [Systolic, Diastolic, Pulse Pressure, and Mean Pressure], Heart Rate, value of Partial Pressure Of Oxygen Saturation Of Capillary Blood , General pattern of pulse tracing.
 - Also, ECG[12 LEADS]- duration of P wave, QRS wave, PQ interval, QT interval, QTc, QT/QTc %, QT/RR %, values of axis in degrees of P, QRS, and T waves evaluated.
 - The ECG was studied for noting rate, regularity, individual waves, P:QRS ratio, morphologic anomaly, important intervals and their values, [duration and voltage] ,wave width, slurring, grouping of waves, dropped beats, bizarre beats, elevation / burial of intervals, arrhythmias[brady. / tachy.] electrolyte anomalies, signs of specific changes of certain phenomena [Wenckebach/ WPW syndr. /Long QT Syndr. /Torsade de pointes] certain signs if at all present like Brugada / Intrinsicoid deflections/Josephson's s. / V Tach. Etc. The parameters related to electrical axis of ECG forP, QRS complex, And T waves were studied. The results are presented in charts.
 - For abovementioned characteristics literature with all12 ECG LEADS shown with illustration was selected as reference.

Figure-1
Sample Size for male and female gender



• **STATISTICAL ANALYSIS:**

The studied parameters were collected in micro soft excel sheet, and processed statistically by SPSS soft ware and presented by tables and graph showing domains with max, min, mean, S.D. and where applicable, by significance.

The male and female parameters are presented separately; but the comparison of critical population with normal young counterpart is not attempted, keeping in mind the moment to moment variability and nature of parameters.

Table: 1

Descriptive Statistics analysis for 30 Female participants

	AGE	WT.Kg.	HT.Cms.	BMI	SBP	DBP	HR	Spo2
Mean	65.40	58.37	154.30	24.57	132.20	80.63	77.63	97.67
Median	63.00	58.00	155.00	24.00	132.50	80.00	79.50	98.00
Mode	60	50 ^a	158	23 ^a	140	80	80	97
Std. Deviation	5.673	9.050	4.801	2.861	10.179	5.156	12.322	.959
Range	20	42	16	14	50	20	52	3
Minimum	60	50	148	20	100	68	56	96
Maximum	80	92	164	34	150	88	108	99

a. Multiple modes exist. The smallest value is shown

b. The table showing the values of relevant selected demographic and non ECG cardiovascular domains and their statistical profile of 30 female participants.

Table:2

Descriptive Statistics for 30 Female for ECG parameter changes

	P	QRS	PQ	QT	QTc	QT/QT c%	QT/ RR	AXI S-P	AXI S- QRS	AXI S-T
Mean	107.93	95.83	162.10	393.97	437.47	90.30	49.80	26.33	13.93	44.27
Median	112.00	95.00	161.00	372.50	416.00	89.00	49.00	40.00	27.50	56.00
Mode	95 ^a	97	182	321 ^a	396 ^a	83 ^a	49	16 ^a	-88	88
Std. Deviation	14.776	10.293	19.930	60.384	66.366	7.975	9.371	65.690	60.043	69.609
Range	60	49	72	233	298	30	37	267	203	246
Minimum	72	76	131	320	340	74	37	-145	-90	-88
Maximum	132	125	203	553	638	104	74	122	113	158

a. Multiple modes exist. The smallest value is shown

b. The assessment of different values of waves and axis domains of standard 12 lead ECG with the assessed statistical profile of 30 females participants.

Table: 3

Descriptive Statistics for 30 Male participants

	NO.	AGE	WT (.Kg)	HT (Cms)	BMI	SBP (mmHg)	DBP (mmHg)	HR	Spo2
Mean	15.50	70.37	62.30	165.23	23.07	136.13	78.67	69.33	97.33
Median	15.50	70.00	62.00	165.00	23.00	137.50	80.00	67.50	97.00
Mode	1 ^a	70	60	165	23	140	80	81	97
Std. Deviation	8.803	6.178	3.436	3.191	1.507	9.916	7.535	14.775	1.155
Range	29	25	16	16	6	49	31	66	5

Minimum	1	60	54	158	20	110	59	40	94
Maximum	30	85	70	174	26	159	90	106	99

a. Multiple modes exist. The smallest value is shown

b. The table showing the values of relevant selected demographic and non ECG cardiovascular domains and their statistical profile of 30 male participants.

Table: 4
Descriptive Statistics for 30 (Male) for ECG parameters

	P	QRS	PQ	QT	QTc	QT/QTc%	QT/R%	AXI S-P	AXI S-QRS	AXI S-T
Mean	105.43	98.20	168.37	400.67	416.40	97.07	44.80	59.80	24.73	40.80
Median	106.00	95.00	168.50	380.00	399.00	97.00	43.00	50.50	26.00	45.00
Mode	113	91 ^a	193	338 ^a	393	97	42	32 ^a	10 ^a	45 ^a
Std. Deviation	15.007	11.149	19.772	70.052	78.685	11.820	11.722	30.682	60.770	77.647
Range	55	45	75	289	349	47	45	163	330	305
Minimum	78	75	140	251	274	76	28	17	-154	-140
Maximum	133	120	215	540	623	123	73	180	176	165

a. Multiple modes exist. The smallest value is shown

b. The assessment of different values of waves and axis domains of standard 12 lead ECG with the assessed statistical profile of 30 males participants

Table: 5

Unpaired T test analysis for Non-ECG & ECG parameters among male and female participants.

Variable	t test (unpaired)	df	P value	Interpretation
Age	-3.661	29	.001	Significant difference
Weight	-2.140	29	.041	Significant difference
Height	-11.128	29	.000	Significant difference
BMI	2.445	29	.021	Significant difference
Diastolic Blood Pressure	1.185	29	.246	Non significant difference
Systolic Blood Pressure	-1.453	28	.157	Non Significant difference
Heart Rate	2.025	29	.052	Non significant difference
SpO2	1.284	29	.209	Non significant difference
Pulse	.675	29	.505	Non significant difference
QRS	-.807	29	.426	Non significant difference
PQ	-1.252	29	.220	Non significant difference
QT	-.373	29	.712	Non significant difference
QTc	1.109	29	.276	Non significant difference
QT/QTc%	-2.324	29	.027	Significant difference
QT/RR%	1.771	29	.087	Non significant difference
AXIS-P	-2.788	29	.009	Significant difference
AXIS-QRS	-.745	29	.462	Non significant difference
AXIS-T	.191	29	.850	Non significant difference

a. overall assessment of various variables by un paired 't' test, d f, 'p' value and significance of all selected demographic, non ECG Cardiovascular parameters and ECG parameters.

DISCUSSION

India is an ageing nation, according to criteria of ageing nation by WHO [World Health Organization] . Presently, prevalence of elderly population at rate of 8.0 -8.5 %, comes to 90 million, but expected to go to 21 % by 2050⁸. 80 % of this population is of the rural persons who are not adequately exposed to health study or health care provisions due to number of

reasons. Total elderly number in India is second largest in the world, so, we need to cover entire population in adequate depth by large number of such and similar study to help them.

As body composition can influence heart condition or the relevant risk factors^{8,9} as such, we have included demographic parameters also.

It is said that cardiac disease is one of the commonest cause of morbidity and mortality in elderly hence this type of assessment done on Indian present day elderly population is justified.

Pathak has stated that elderly were more inquisitive to know about the exact figure of their blood pressure values. He has also stated that with increase in age, the blood pressure increased in Indians also, though not as much as in elderly people of advanced countries.¹⁰ Sharma also has similar observations that in US, elderly hypertension is about 90 % but not so in Indian elderly population¹¹.

On this Pickering while comparing the low adolescent maintained pressure throughout life, commented that, the answer would lie between security of life in tribe and insecurity in civilization.-which causes arterial pressure to rise with age.¹²

In Pathak's series, the basal blood pressure has range of systolic Blood Pressure between 100-204mm. of Hg. and Diastolic Blood Pressure 60-130mm.of Hg. He puts 170/100mm.Hg.as hypertensive,140/80 mm. Hg. as intermediate and <140/80 as normotensive. He has quoted authorities of past, who fixed varied values of blood pressure as hypertension. As such we have not categorized for tension norms but simply mentioned the values. The values above 140/90 mm Hg. is hypertension.

In literature, there is evidence that BMI has association with left ventricular hypertrophy¹², and as it is also mentioned that the LVH[Left Ventricular Hypertrophy] identified by electrocardiography or echocardiography,¹³ is associated with increased risk factor for coronary heart disease, sudden death¹⁴, stroke, and overall cardiovascular disease.

ECG is not helpful for diagnosing heart failure but in diagnosis of Chamber Enlargement, Hypertrophy, M.I. and Cardiac Arrhythmia it can help the diagnosis of the cause. LVH may be present in over 65 % of people over 65 years.¹⁵

The mean H.R.[Heart Rate] in elderly Indians, in past study was males -75.9 and females -76 BPM[Beats Per Minute][Pathak]

We also observed ECG abnormality of minor importance in large percentage(vide-tables). This is substantiated in studies of past as well as by contemporary Indian experts. This is also by reason that even an increase in 1 millisecond more than the approved range, we categorized as abnormal, which may not influence the cardiac function so adversely till the

heart variability or compensatory factors operate in the favor of elderly, but increase can influence the statistics of abnormal value. Sharma has stated that 9.7 % ECG changes in middle aged, in 65-84 years ECG changes suggesting CAD is 16.8 %. Incidence of arrhythmias in elderly is high. Atrial Premature Beats are very common in elderly and do not require treatment.[Sharma]So risk stratification by stress test is suggested; Author has also mentioned that Premature Ventricular Complexes are common in elderly. Kennedy¹⁵ stated that less than half of elderly have normal ECG and ¼ have multiple electrocardiographic abnormalities. Sinus tachycardia, and non symptomatic extrasystole were only a few in our sample of uncomplicated aging participants. Pathak states that, “the elderly people should not be unnecessarily alarmed on finding slight deviation of ECG record.”

CONCLUSION

We studied 30 male and 30 female age specific community dwelling middle class elderly participants staying for more than 5 years in Vadodara city, with a purpose to find existence and magnitude of characteristics in demographic and selected cardiovascular parameters.

In the study we found that the demographic parameters were within expected range and not significantly high or low. We found that the results of changes of heart rate, blood pressure, pulse wave and SPO2 are in accordance of valid study of past Indian or present international literature. The ECG changes also suggest described characteristics as presented in tables. The sample size being small, this data cannot help in fixing the norms or, aid as conclusive evidence for diagnosis, but indeed can help enriching such similar study.

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CONFLICT OF INTREST

Authors have no conflict of interest.

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9 original article:**LAPAROSCOPIC VERSUS OPEN REPAIR IN MANAGEMENT OF PEPTIC PERFORATION PERITONITIS: A COMPARATIVE ANALYSIS**

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Abstract

Introduction: Despite the widespread use of antisecretory agents and eradication therapy, the incidence of perforated peptic ulcer has changed little. Since the initial reports of successful laparoscopic management of perforated duodenal ulcers and perforation peritonitis several larger comparative series have been published confirming the technical feasibility and advantages of laparoscopic approach. **Objectives:** The aim is to compare the outcome and efficacy of laparoscopic repair with conventional laparotomy in the management of peptic perforation. **Methods:** The study was conducted on patients with diagnosis of peptic perforation in V.S. Hospital, Ahmedabad. It is a retrospective study from August 2014 to November 2016. **Result:** 50 patients of perforation peritonitis were operated randomly by laparoscopic repair and laparotomy. It was found that the laparoscopic repair of perforated peptic ulcer was associated with less intra operative blood loss, no intraoperative and postoperative complications, minimum postoperative pain which was significant as compared to laparotomy repair. **Conclusion:** Laparoscopic repair of perforated peptic ulcer could be considered as a good alternative for open repair in routine clinical practice in the management of peptic perforation peritonitis as less intraoperative blood loss, less postoperative pain and better cosmesis.

Key words: Laparoscopy,laparotomy, peptic ulcer, perforation.

Introduction

Peptic ulcer perforation is the common complication of peptic ulcer disease it presents as a perforated peritonitis and represents 3% of all abdominal emergency. It occurs in 5-10% of patients of peptic ulcer. There is increased incidence of perforated peptic ulcer because of smoking, alcoholism and use of NSAIDS. 75% of patients of perforated peptic ulcers are helicobacter pylori positive. During the past decade the need for elective operation for peptic perforation has decreased due to proton pump inhibitors. However, emergency operations for acute complications such as perforation or bleeding remain constant. Surgical repair is the treatment of choice. The traditional approach is closure of perforation with an omental patch i.e. Graham patch described in 1937.In 1989 Mouret performed first laparoscopic repair of perforated duodenal ulcer[1]. Mouret was soon followed by Nathanson who in 1990 performed laparoscopic repair and peritoneal toilet [2]. In 1991 Costalet described laparoscopic repair of perforated gastroduodenal ulcer by using ligamentum teres. Laparoscopic repair of peptic perforation is well accepted management at present and associated with less operative time,pain,post operative infection, morbidity, mortality and better cosmetic outcome.

Materials and methods

The study was conducted at department of general surgery, Sheth V.S.Hospital, Ahmedabad and include total of 50 patients with 25 patients in open and 25 for laparoscopic approach after taking consent from patient and relative.

Inclusion criteria

1. Patients with clinical diagnosis and radiological evidence of perforated peptic ulcer.
2. Patients of both sex with age 15 to 70 years.
3. No medical or surgical contraindication to general anaesthesia and laparoscopic surgery.

Exclusion criteria

1. Complicated ulcers like bleeding ulcer, ulcer situated over posterior wall.
2. Clinically sealed perforation.
3. Patients with abdominal malignancy.
4. Patients with COPD, heart disease, coagulopathy, obesity, cirrhosis, advanced pregnancy.

Statistical analysis

The results were interpreted as mean value. The parameters in both the groups were compared by

unpaired t-test. Values were considered significant if $p > 0.05$.

Result

Table: 1. Comparison of blood loss, operating time and complications.

	Group 1 (Laparoscopy)	Group 2 (Laparotomy)	P value
Operating Time	106	60	0.0021
Blood loss	60	90	0.0009
Complications	2	6	

Operating time was 106 minutes in laparoscopy group 1 and 60 minutes in laparotomy group 2. Blood loss was 90 ml in group 2 and 60 ml in group 1.

Table: 2. Comparison of various parameters between Group 1 and Group 2

No. of days	Group 1 (Laparoscopic)	Group 2 (Laparotomy)	P Value
Analgesic use	1.2	3.8	<0.0001
Resumption of food	2.4	3.6	0.0391
Hospital stay	9.4	9.8	0.7252
Nasogastric tube	3.2	3.2	1.0000

Ambulation	2.4	3.4	0.0009
Drain in situ	2.2	3.8	0.0068

Parenteral analgesic requirement was 3.8 days in group 2 and 1.2 days in group 1 ($p>0.05$). duration of nasogastric tube aspiration was 3.2 days with group 1 and was 3.2 days in group 2. Resumption of normal diet was 2.4 days with group 1 and 3.6 days with group 2. Ambulation in group 1 is 2.4 days and in group 2 was 3.6 days. Duration of intraabdominal drain in situ in group 1 was 2.2 days and in group 2 was 3.8 days. Duration of hospital stay for laparoscopic repair was 9.4 days as compared to 9.8 days with laparotomy

Discussion

There were 50 patients recruited, ages 16 to 70 years. The two groups were compared. Operating time was significantly longer in laparoscopy group (106 versus 60 minutes), which is comparable to other studies. A possible explanation for longer operative time is that laparoscopic suturing is more demanding especially if the edges of the perforation are infiltrated and friable and lengthy irrigation procedure. But the estimated blood loss is more in open surgeries 90 ml vs 60 ml in laparoscopic repair. This is because of the length of incisions, handling of tissues in contrast to minimal handling in laparoscopic repair. After surgery patients in laparoscopic group required significantly less parenteral analgesics than those who underwent open repair (1.2 days in group 1 vs 3.8 in Group 2, $p>0.05$) which is statistically significant. The Meta analysis published by Lau showed that eight out of 10 studies showed significant reduction in dosage of analgesics required in laparoscopic group [3,5]. Mean duration of resumption of normal diet was 2.4 with laparoscopic repair and 3.6 with laparotomy. The reason for that is minimal bowel handling in laparoscopy produces less postoperative ileus. Mean duration of ambulation was 2.4 with laparoscopic repair and 3.6 with laparotomy. The reason for early ambulation is less postoperative pain in patients with laparoscopic repair as compared to the large abdominal incisions employed in laparotomy [6]. Mean duration of intra abdominal drain in situ in patients with laparoscopic repair was 2.2 days and in patients with laparotomy was 3.8 days. Mean duration of hospital stay for laparoscopic repair was 9.4 days compared to 9.8 days for patients with laparotomy. There was one conversion from laparoscopic repair to laparotomy in a 70 year old male due to large size perforation and unusual nature of the perforated ulcer and need for biopsy. European Association of Endoscopic Surgeons consensus statement states that Laparoscopy is clearly superior for patients with perforated peptic ulcer disease [4].

Conclusion

We concluded that Laparoscopic repair of perforated peptic ulcer could be considered as a good alternative for open repair in routine clinical practice in the management of peptic perforation peritonitis if no contraindication of laparoscopy.

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10 original article:**ROLE OF ULTRASONOGRAPHY IN WRIST PATHOLOGY** –original article.

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ABSTRACT :**Objective:**

The aim of this study is to demonstrate USG findings of various wrist pathologies.**Material and**

Method:

During the period of September- 2015 to January 2017 a prospective study of eighty patients was carried out with relevant clinical history, examination and laboratory investigations. High resolution ultrasound was carried out on GE logiq P5 with 7.5 MHz linear and 3.5MHz curvilinear probe with adequate standoff mound of gel to allow optimal visualization of most superficial structures. Bilateral wrists, second to fifth metacarpophalangeal joints and proximal interphalangeal joints were examined in axial and sagittal planes, keeping the joint in neutral position. Power Doppler mode was also used to evaluate vascularity of hypertrophied synovium or thickened tendon sheath and to differentiate it from fluid (effusion).**Results:** Our study included patients from age group 21-60 years. Mean age of our study group was 40.6 years, total 60 females and 20 male patients. Out of 80 patients, 56(70%) consisted of patients with ganglion cyst, 10(12.5%) were of rheumatoid arthritis, 8(10%) were of tenosynovitis, 4(5%) were of tendon tear and 2(2.5%) was of carpal tunnel syndrome. Synovial hypertrophy was seen as abnormal hypoechoic intraarticular tissue that may show Doppler signal. Synovial effusion was seen as abnormal anechoic intraarticular area that does not show Doppler signal. It was found in 2/10 (20%) patients of RA, 3/4 (75%) patients of tenosynovitis, 4/4(100%) patients of tendon tears. Vascularity (on power Doppler) of the thickened synovial tendon sheath was found in

12/56 (21%) patients of ganglion cyst, 4/10 (40%) patients of rheumatoid arthritis, 6/8(75%) of tenosynovitis. **CONCLUSION:** USG provides a cheap and cost effective alternative to costlier modalities like MRI. Its real-time imaging ability is a major advantage while evaluating tendons of the hand. Thus, ultrasound has multidimensional role in various wrist pathologies such as ganglion cyst, rheumatoid arthritis, tenosynovitis, tendon tears and carpal tunnel syndromes.

Key words:

Ultrasonography (USG), RA- rheumatoid arthritis, Wrist, Ganglion

INTRODUCTION:

Advances in transducer technology have led to the development of very high frequency probes that allow imaging of superficial structures with excellent details. The major advantages of USG wrist is fine spatial resolution, speed of examination and real time dynamic assessment, lack of radiation, portability and low cost ⁽¹⁾. So despite dramatic advances in imaging in form of CT scan and MRI, USG provides economic, non invasive imaging of tissues in static as well as dynamic states and in serial studies where indicated.⁽¹⁾

In addition synovial and cartilage thickness can be accurately quantitated providing an objective means following the patients with inflammatory arthritis. Joint effusion, loose bodies, tendinitis and tendon and muscle ruptures can all be demonstrated sonographically.⁽²⁾

AIMS AND OBJECTIVES

1. To subject wrist lesions suspected clinically or detected by radiography, to ultrasound.
2. **To study the ultrasound characteristics of wrist lesions of muscles, tendons, joints and their internal architecture and bones.**
3. **To study the incidence of age and sex with various wrist pathologies.**
4. **To highlight sensitivity and specificity of ultrasound in detection and characterisation of wrist disorders in comparison with other modalities.**

METHODS AND MATERIALS:

During the period of September- 2015 to January 2017 a prospective study of eighty patients was carried out.

- Each patient was studied in detail with relevant clinical history, examination and laboratory investigations. High resolution ultrasound was carried out on a GE logiq P5

with 7.5 MHz linear and 3.5MHz curvilinear probe) with adequate standoff mound of gel to allow optimal visualization of most superficial structures. Bilateral wrists, second to fifth metacarpophalangeal joints and proximal interphalangeal joints were examined in axial and sagittal planes, keeping the joint in neutral position.

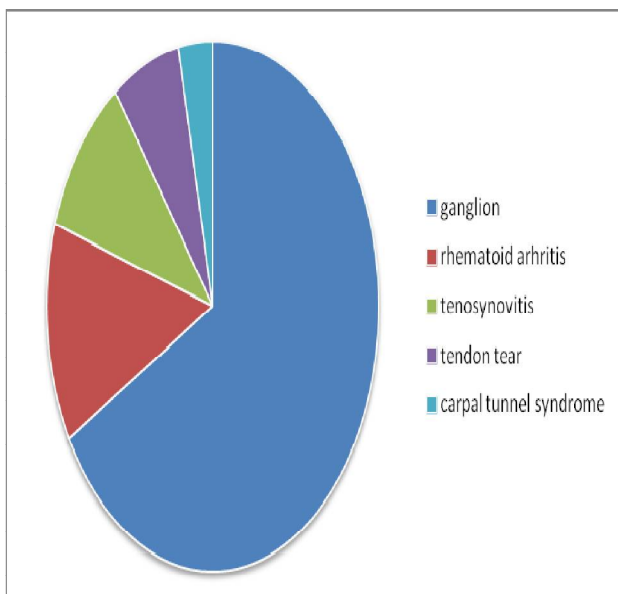
- Ultrasound findings such as synovial hypertrophy (pannus), peri tendinous fluid, integrity of the tendon, synovial effusion, bone erosions, tendon sheath thickening or fluid were recorded.
- Power Doppler mode was also used to evaluate vascularity of hypertrophied synovium or thickened tendon sheath and to differentiate it from fluid (effusion).

RESULTS

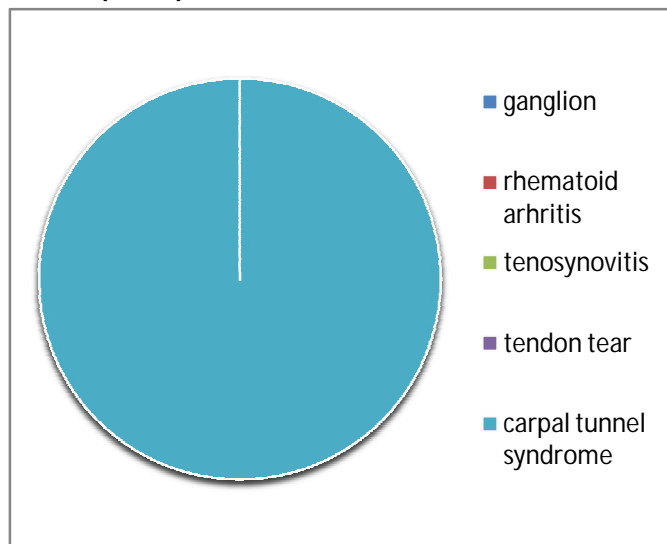
TABLE 1

Distribution of cases according to sex (n=80)

Female (n=60)



male (n=20)



- The study group consisted of 60 females and 20 male patients.
- Out of 80 patients, 56(70%) (40 female, 16 male) consisted of patients with ganglion cyst, 10(12.5%) (8 female, 2 male) were of rheumatoid artheritis, 8(10%) (6 female, 2 male) were of tenosynovitis, 4(5%) (4 female) were of tendon tear and 2(2.5%) (2 female) were of carpal tunnel syndrome.

TABLE 2**Distribution of cases according to age (n=80)**

AGE	GANGLION	RA	TENOSYNOVITIS	TENDON TEAR	CARPAL TUNNEL
In years	Number of patients				
21-30	10	4	2	0	0
31-40	22	2	2	4	0
41-50	14	4	2	0	0
51-60	10	0	2	0	2
TOTAL	56	10	8	4	2

- Our study included patients from age group 21-60 years.
- Mean age of our study group was 40.6 years

TABLE 3**Distribution of cases according to clinical symptoms (n=80)**

Clinical symptom	GANGLION	RA	TENOSYNOVITIS	TENDON TEAR	CARPAL TUNNEL
	Number of patients				
PAIN	6	5	8	4	2
SOFT TISSUE SWELLING	28	1	2	0	0
JOINT SWELLING	0	3	0	0	0
MOVEMENT DIFFICULTY	0	2	8	4	2
MORNING STIFFNESS	0	1	0	0	0

- Most patients presented with more than one symptom.
- Most common symptom in ganglion was soft tissue swelling.
- Joint pain or tenderness was the most common symptom seen in rheumatoid arthritis. Morning stiffness was predominantly seen in rheumatoid arthritis patients.
- Most common symptom in tenosynovitis, tendon tear and carpal tunnel syndrome were pain and difficulty in movement.

TABLE 4

Ultrasound findings of examined cases (n=80)

Diseases Ultrasound findings	GANGLION	RA	TENOSYNOVITIS	TENDON TEAR	CARPAL TUNNEL SYNDROME
Synovial hypertrophy	0	9	0	0	0
Vascularity of synovium	0	8	0	0	0
Synovial effusion	0	2	6	4	0
Tendon sheath thickening	14	6	6	0	0

Vascularity in thickened sheath	12	4	6	0	0
Enlargement of median nerve	0	0	0	0	2
Peritendinous collection	6	1	6	4	0
Anechoic cyst	25	0	0	0	0

- Ganglions most commonly presented with anechoic cystic lesion- seen in 25/56 patients, 14/56 patients show tendon sheath thickening and 12/56 patients show vascularity in tendon sheath and 6/56 patients show peritendinous collection.
- Synovial hypertrophy was seen as abnormal hypo echoic intraarticular tissue that may show Doppler signal. It was found in 9/10 patients of RA. Power Doppler showed vascularity of hypertrophied synovium in 8/10 patients of RA.
- Synovial effusion was seen as abnormal anechoic intraarticular area that does not show Doppler signal. It was found in 2/10 patients of RA. 6/8 patients of tenosynovitis, 4/4 patients of tendon tears.
- Carpal tunnel syndrome presents with enlarged median nerve as compared to contra lateral wrist.

DISCUSSION:

USG is the modality for the examination of the soft tissues because of its multiplanar and real time imaging facilities. Information can be gained during active and passive mobilisation which

can't be gained by other modalities. The non invasive nature of the examination and lack of ionising radiation make it very well accepted by patients as well as radiologists. Brief discussion of common wrist pathologies is as below:

(1) Ganglion

Ganglion cysts are very common lumps within the hand and wrist that occur adjacent to joints or tendons. ^(3, 4, 5) The most common locations are the top of the wrist, the palmer side of the wrist, the base of the finger on the palm side, and the top of the end joint of the finger. Though nowadays MRI has been used to characterize such lesions, but a recent study has shown that sonography can also be used not only for distinguishing solid from cystic lesions but also for specifically diagnosing ganglia. Classically ganglia seen as a well-defined, cystic lesions with posterior acoustic enhancement, implying that most are "simple cysts" ^(4, 5) but all cysts don't follow these criteria. The strength of sonography lies in its ability to differentiate a solid mass from a cyst; this is critical because the differential diagnosis for a solid mass typically includes malignant tumours. The treatment for a ganglion differs from a benign neoplasm and synovitis. Majority of ganglia are completely avascular on colour Doppler sonography, few complex cystic ganglia may show colour Doppler flow, likely due to superimposed inflammation.

(2) Rheumatoid arthritis:

Rheumatoid arthritis is a chronic progressive systemic disease, characterized by synovial inflammation, leading to cartilage damage and bone destruction ^(8, 9). USG is a method of choice for directly visualizing the articular and periarticular pathology in rheumatoid arthritis, and it can also detect the early inflammatory changes, such as synovitis and bone erosions. It can also be used as a good indicator for disease activity, especially with power Doppler USG, to diagnose subclinical cases of arthritis and evaluate response to therapy ^(4, 8). Findings on USG include bone erosions, tenosynovitis with tendon thickening and increased color Doppler flow in the thickened tendon sheath and joint effusion with hypertrophic synovium ⁽⁹⁾.

(3) Tendon tears:

The annular pulleys can be accessed directly by USG, increased tendon-phalanx distance and the consequent bowstringing of the tendon helps in diagnosis. This is measured at the level of the A2 and A4 pulleys, at rest and on flexion against resistance ^(4,11). The normal distance at the A2 pulley is < 1mm and at the A4 pulley is < 2.5 mm. For A2 pulley, distance of > 1mm, < 3mm is considered a sign of incomplete and >3 mm is a sign of complete rupture. A tendon-phalanx distance of > 5 mm is a sign of A2 and A3 pulley rupture. For the A4 pulley, a distance of > 2.5 mm is a sign of complete rupture ⁽¹³⁾.

(4) Tendon disorders:

Tendon disorders usually associated with athletic and occupational activities leading to overuse. Major advantage is their superficial location, so can be easily assessed. Tendinitis is mostly associated with activities which lead to repeated microtrauma. Acute tendinitis shows the thickened tendon with ill-defined margins and decreased

echogenicity.

Tenosynovitis is an inflammation of the tendon sheath⁽³⁾ and can be caused by trauma, pyogenic infection or rheumatoid arthritis^(4,5,6). USG reveals fluid in the tendon sheath. This is seen as an anechoic halo around the tendon on axial images. During USG, percussion of the tendon sheath can be used to differentiate between fluid and inflamed synovium. Hypoechoic synovial sheath thickening is seen in chronic tenosynovitis.

(5) Carpal tunnel syndrome :

Carpal tunnel syndrome arises from compression of the median nerve at the wrist. This is mostly seen in female and can be due to pregnancy, hypothyroidism, space occupying lesions, diabetes, and anatomic variants like narrow tunnel and abnormal / accessory muscles or vessels. In later cases the nerve becomes swollen and exhibits changes in shape and echo pattern. The nerve appears bulky at the proximally and flattened at the distal aspect. A cross-sectional area of > 10 mm of the median nerve, is considered diagnostic at the proximal tunnel level.^(2,4)

(6) Other pathologies identified by ultrasonography:

- Nerve injury
- wrist effusion and/or synovial thickening (inflammatory/traumatic/septic)
- intersection syndrome
- scapholunate ligament injury
- TFCC injury
- aneurysm/pseudoaneurysm
- neuromas

CONCLUSION:

USG provides a cheap and cost effective alternative to costlier modalities like MRI. Its real-time imaging ability is a major advantage while evaluating tendons of the hand. Thus, ultrasound has multidimensional role in various wrist pathologies such as ganglion cyst, rheumatoid arthritis, tenosynovitis, tendon tears and carpal tunnel syndromes.

IMAGES

IMAGE 1: A well defined anechoic cystic lesion noted along dorsal aspect on radial side of right wrist, s/o ganglion cyst.

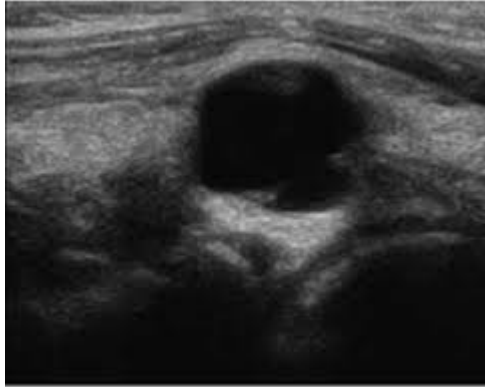


IMAGE 2: In a known case of RA, left wrist shows thickened synovium with increased vascularity on power Doppler study, s/o synovitis .

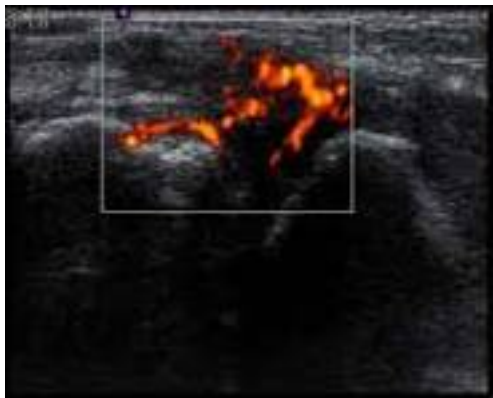


IMAGE 3: In a case of trauma flexor group of muscle show bulky tendon with discontinuity of fibres, s/o tear.

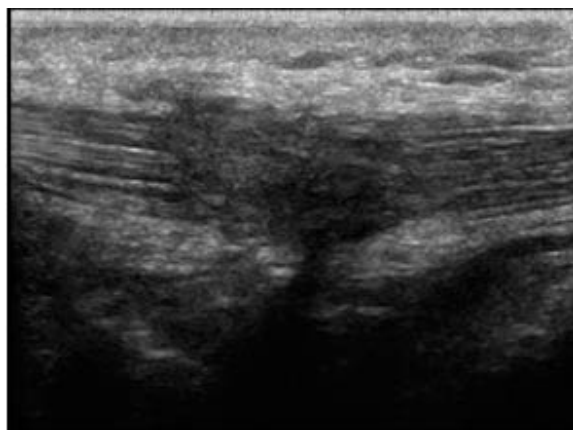


IMAGE 4: On dorsal aspect of left wrist, usg shows bulky tendon with peripheral hallow of fluid, s/o tenosynovitis

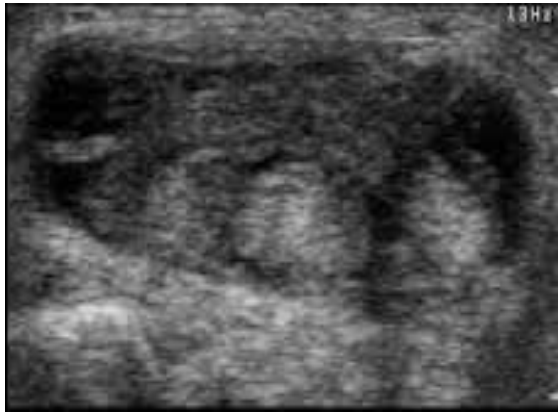


IMAGE 5: in female hypothyroid patient, shows bulky median nerve with CSA 10 mm s/o carpal tunnel syndrome

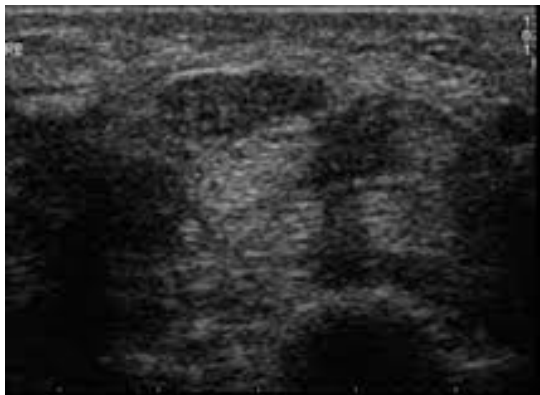
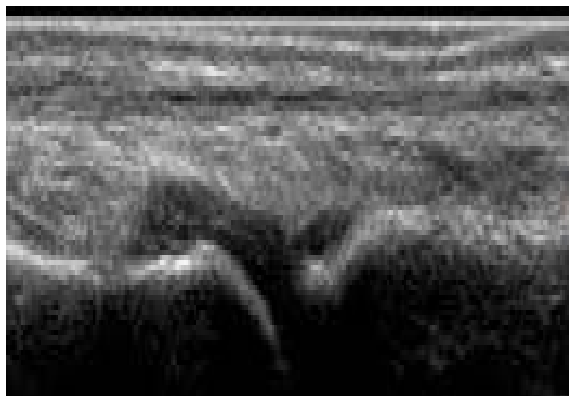


IMAGE 6: fluid noted in carpo-metacarpal joint on right side, s/o synovial effusion .



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11 ORIGINAL ARTICLE :**ANTENATAL DIAGNOSIS OF PELVI-URETERIC JUNCTION OBSTRUCTION & ITS OUTCOME**

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ABSTRACT

Background: The term pelvic-ureteric obstruction denotes a restriction of flow of urine from the renal pelvis to the ureter which if left uncorrected will lead to progressive renal deterioration. Today majority of the cases are identified and diagnosed in the perinatal period (1,9). To a lesser degree it is also seen in childhood and adolescence period. However not all the cases of PUJ obstruction require surgery

Aim: A retrospective analysis of antenatally detected cases of hydronephrosis was done to elucidate the postnatal outcome and management on a prolonged follow up.

Materials and Method: From about 5000 antenatal ultrasound scans carried out at our institute annually from NOVEMBER 2011 to JANUARY 2014, total 49 cases were suggestive of hydronephrosis; 34 out of these 49 (70%) were diagnosed as Pelvi-ureteric junction obstruction.

Setting and Design: A retrospective study of patients with hydronephrosis detected on antenatal ultrasound scan from NOVEMBER 2011 to JANUARY 2014.

Results: 9 out of 34 babies (25%) detected to have Pelvi-ureteric junction obstruction on antenatal ultrasound were transient obstructions. Out of the remaining 25 cases, 7 (28%) did well on observation alone and did not require surgery while the rest 18 (72%) required surgical intervention.

Conclusion: Conservative management of Pelvi-ureteric junction obstruction is a safe procedure, provided diligent follow up is maintained and surgical intervention is done in case of deterioration of renal function or presence symptoms or both.

Statistics and analysis: The study was subjected to bi-variable analysis with two test preparation and was statistically significant while $p < 0.05$.

Key words: Hydronephrosis, Pelvi-ureteric junction obstruction, Antenatal diagnosis.

INTRODUCTION

The term pelvic ureteric obstruction denotes a stricture of flow of urine from the renal pelvis to the ureter which if left uncorrected will leads to progressive renal deterioration. Today majority of the cases are identified and diagnosed in the perinatal period. To a lesser degree it is also seen in childhood and adolescence period. However not the all case of Pelvi-ureteric junction obstruction require surgery (11).

With this aim a retrospective analysis of antenatal detected cases of hydronephrosis from NOVEMBER 2011 to JANUARY 2014 was done to elucidated the postnatal outcome and management on a prolonged follow up.

MATERIAL & METHOD

From about 5000 antenatal ultrasounds carried out at our institute annually ,from NOVEMBER 2011 to JANUARY 2014,49 cases suggestive of hydronephrosis diagnosed antenatally were studied. The cases which were due to posterior urethral valves, vesico-ureteral reflux or multicystic dysplastic kidney were excluded from the study. After delivery the babies were subjected to physical examination to assess their general condition, recording of the vital data & for presence or absence of a palpable kidney lump. A postnatal Ultrasound was done at birth and again at 7th day to record the Antero-Posterior diameter of renal pelvis. The babies also underwent a DTPA(diethylenetriaminepentacetate) nuclear scan at 3 months of age and the differential renal function was noted.

The patients were initially managed conservatively. The follow up included the ultrasound examinations every three months for 1 year and every six months thereafter. The DTPA(diethylenetriaminepentacetate) renal scan was repeated at 1 year of age or when the child became symptomatic, to decide on the future course of management. The average follow up was 36 months(5 years to 24 months)

RESULTS

All the babies in the study had average APGAR scores and their weight ranged from 2.1kg to 3.6kg. A palpable kidney lump was present in 2 out of the 49 cases showing hydronephrosis on the antenatal Ultrasound. 34 babies had Pelvi-ureteric junction obstruction while the rest were either due to Posterior urethral valve,Vesico-ureteric reflux or Multicystic dysplastic kidney (Table 1).

CASES OF HYDRONEPHROSIS	NO. OF CASES	PERCENTAGE
Posterior urethral valve	5	10.2
Multicystic dysplastic kidney	4	8.1
Vesico-ureteric reflux	6	12.2
Pelvi-ureteric junction obstruction	34	69.5
TOTAL	49	100

Of the 34 cases having Pelvi-ureteric junction obstruction, 9 had transient dilatation which resolved after birth. They were followed up for a period of 12 months with periodic ultrasound scan and were excluded from further studies. Of the remaining 25 cases, the sex ratio was roughly 3:1 with 19 males and 6 females. The right side was affected in 5, left in 17 and there were 3 bilateral cases.

The tabulation of Antero-posterior diameter of renal pelvis as measured on Ultrasound scan was as follows. (Table-2)

ANTERO-POSTERIOR DIAMETER	NO. OF CASES	PERCENTAGE
<10mm	1	4
11-15mm	6	24
16-20mm	2	8
21-25mm	4	16
>25mm	12	48

The DTPA(diethylenetriaminepentacetate) renal scan was carried out in all the patients. A differential function of >40 % was present in 11 patients, 36-40 % in 3 patients, 31-35% in 3 patients and <30% in 8 patients. (Table.3)

RENAL FUNCTION ON DTPA(Diethylenetriaminepentacetate) SCAN	NO. OF CASES	PERCENTAGE
41-45	11	44
36-40	3	12
31-35	3	12
<30	8	32

7 patients who had more than 40% renal function did well on conservative management. The Antero-posterior diameter of 6 of these patients was <15mm. while 1 had a diameter of 18mm. One patient whose Antero-posterior diameter was <15mm had repeated episodes of Urinary tract infections and was subjected to surgical correction. Of the remaining 18 patients, 11 underwent early surgery because of a combination of falling renal function complicated by Urinary tract infections. The other 7 were initially observed on successful conservative management, but developed lump in abdomen with Urinary tract infections and pain later on and were subjected to late surgery.

As regard to the 3 cases of bilateral obstruction, one patient had mild hydronephrosis on both the sides with preserved differential functions and was doing well at 60 months follow up. The second patient had Multicystic dysplastic kidney on one side and was taken up for surgery to salvage the solitary kidney. While the third case underwent surgery on one kidney while the other kidney was stable and showed a sluggish non-obstructive flow pattern on the renal scan.

The surgical procedure done in all the cases was open Anderson – Hynes pyeloplasty. All the patients had either a transanastomotic double J stent or an infant feeding tube designed to function as both, a stent and a nephrostomy tube. The double J stents were cystoscopically

removed 6 weeks after the operation. The nephrostomy cum stent was removed on 10th post-operative day after performing a nephrostogram.

On follow up of the 11 patients undergoing early surgery, 2 patients showed improvement in function on renal scan done 6 months after the operation while 9 had stable renal function. In the late surgery group of 7 patients there was no improvement in the renal function on post-operative scans, but there was no deterioration either. One of the 11 patients of early surgery group developed recurrent Urinary tract infections. On follow up he was diagnosed as having partial Vesico ureteric junction obstruction and improved after re implantation. In the late surgery group, 2 patients continued to have episodes of Urinary tract infections on follow up and were kept on long term chemoprophylaxis.

DISCUSSION

Over the past 4 decades, fetal diagnostics has improved tremendously and many anatomic abnormalities can be accurately detected by ultrasonography (4).

In antenatally detected hydronephrosis an incidence of 52-60% has been reported to be due to Pelvi-ureteric junction obstruction (3,8). In our series approximately 70% of cases were diagnosed as having Pelvi-ureteric junction obstructions, probably due to the timing of antenatal ultrasound in late 2nd trimester or early 3rd trimester. The preponderance of the left side (68% vs 32%) has been reported elsewhere also (10). It has been postulated that left ureter is more vulnerable to ischaemic damage than the right ureter, because of its increased length as compared to the right ureter. In a series reported by Liang et al (6). 73 % of cases were managed conservatively. while this figure was 62% in Duong et al's report (2). In our series 72% (18 out of 25) required surgery.

There was a strong correlation between differential renal function and also the Antero-posterior diameter with need for surgery (5). Of the 11 patients with differential renal function >40%, 7 patients did well on conservative management, while 4 patients (36%) required surgical intervention. From the 7 patients having Antero-posterior diameter <15mm, 1 (14%) developed symptoms on follow-up and was subjected to surgical correction.

The development or persistence of symptoms (pain, fever, kidney lump) along with deteriorating renal function formed a strong basis for intervention in the 18 patients submitted for surgery. The deterioration of renal function was the reason for surgical intervention in 6 patients, while the rest developed symptoms during the course of observation. One needs to follow up the patients with Pelvi-ureteric junction obstructions closely (7). Although it is a benign condition, if intervention is not done at proper time, one can lose the kidney.

CONCLUSION

25% babies detected to have Pelvi-ureteric junction obstruction on antenatal ultrasound were transient obstruction (9 out of 34). 28% (7 out of 25) did well on observation alone and did not required surgery. The patient of the early surgery group (44%) showed either deterioration of

renal function or development of symptoms or a combination of both. Conservative management of Pelvi-ureteric junction obstruction is a safe procedure, provided diligent follow up is maintained and surgical intervention is done in case of deterioration of renal functions or presence of symptoms or both.

This is a small series for generalisation of the conclusions. However a study incorporating the major institutes of all the states in co-ordination with the obstetrics and the paediatric departments would go a long way in deciphering the natural history of ante-natally diagnosed cases of Pelvi-ureteric junction obstruction.

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12 original article

CHANGES IN CORNEAL HIGHER ORDER ABERRATIONS (HOAS) AND ITS EFFECT ON QUALITY OF LIFE AFTER WAVEFRONT OPTIMIZED LASIK

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PURPOSE: To Measure the corneal Higher Order Aberrations and quality of life changes produced by Standard Laser in situ keratomileusis (LASIK) for Myopia.

SETTING: Nagri Eye Hospital and Research Foundation Trust, Ahmedabad, India

DESIGN: Prospective Clinical Experimental Study

METHODS: The study comprised 29 subjects with mean age group of 24.17 ± 3.81 SD years with myopia or myopic astigmatism. The manifest Refraction Spherical Equivalent [MRSE] mean was $-4.33D \pm 1.96SD$ (astigmatism of 0.0D to $-2.75D$). Corneal Higher order aberrations was measured preoperatively and 1, 3,6 month post operatively with zeimer Galilei G4 Topographer. A validated questionnaire on post LASIK quality of life was introduced to selected subjects. Residual Manifest Refraction Spherical Equivalent [MRSE], uncorrected Distance Visual Acuity [UDVA] corneal Higher- Order Aberrations [HOAs] were analysed on 6 months postoperative follow up.

RESULT: The amount of corneal higher order aberrations increased with LASIK. Pre LASIK the Total root mean square, Spherical Aberration, Coma, Trefoil, Defocus and Astigmatism mean value were [mean (μm) \pm SD] 0.37 ± 0.45 , 0.04 ± 0.06 , 0.09 ± 0.11 , 0.05 ± 0.06 , 0.16 ± 0.19 , 0.34 ± 0.40 respectively and post LASIK mean were [mean (μm) \pm SD] 0.44 ± 0.52 , 0.11 ± 0.14 , 0.12 ± 0.16 , 0.09 ± 0.11 , 0.30 ± 0.39 , 0.27 ± 0.33 found ($p < .001$).

The UDVA was 0.0 Log MAR or better. Postoperative residual MRSE mean was $-0.09D \pm 0.16$ SD. After LASIK majority of subjects have found change for better, No difficulty in near intermediate and daily activities. In night Driving 51.72% had no difficulty & 41.37% had a little difficulty found. Starbursts or halos around the light seen by 41.37% most of the time and 31.03% some of the time, that make it difficult to see. Subjects were highly satisfied with Clarity of vision, working in outdoor and with mental status. Subjects were more happy with LASIK than previous glasses or contact lens correction.

CONCLUSION: Total Corneal Higher order Aberrations increasing after LASIK. Even With increasing corneal HOAs quality of life & visual outcome is maintained up to the requirements of subject's expectation level.

Introduction

In recent years, a number of possible surgical procedures in ophthalmology have offered prospective subjects an alternative to wear spectacles or contact lenses.¹ Several laser and non laser refractive surgical procedures have been used to modify the shape of the cornea and correct myopia, hyperopia, astigmatism, and presbyopia. Introduction of the excimer laser to reshape the cornea has resulted in remarkable developments in the correction of these refractive errors. Combined with other advanced ophthalmic instruments, laser refractive eye surgery has resulted in a substantial increase in the safety, efficacy, and predictability of surgical outcomes.¹ Laser *in situ* keratomileusis has become one of the most popular procedures for the reduction or elimination of myopic refractive errors and has emerged as the refractive corneal surgical procedure of choice for the correction of myopia.²

Quality of life (QOL) refers to a multitude of subjective experiences important to people's lives.³ QOL assesses different dimensions that include physical status, functional abilities, psychological state and well-being, and social interaction.⁴ The physical status alludes to symptoms related to treatment, or results of surgery. The functional abilities refer to an individual's ability to perform daily activities; related to mobility and self-care. The psychological state describes the emotional status, perception of well-being, life satisfaction, and happiness. Negative and positive effects of surgery are assessed in this dimension. The negative effects include the level of anxiety, depression, guilty, and worry. As a result of the medical or surgical intervention, positive emotional states may produce improvement in the emotional functioning, such as joy, vigour, and hopefulness.⁴ The importance of quality of vision (QOV) along with quality of life (QOL) in medicine has been recently widely recognized.⁴

We have conducted studies to quantitatively analyze factors related to QOV in post LASIK subjects. We have assessed QOL by use of validated questionnaires by NATIONAL EYE INSTITUTE REFRACTIVE ERROR QUALITY OF LIFE INSTRUMENT—425 (NEI RQL-42). NEI RQL use traditional Likert scoring in which subjects response score for a selected set of items are summed to derive the overall score. Likert scoring assumes the value of each item represents equal difficulty, and it scores them equally. In addition, the linear response scale used for each item assumes uniform changes for that item.

HOA are present in all human eyes, but in normal, unoperated eyes HOAs are so minor that they are barely noticeable if at all. The cutting of a LASIK flap and ablation of corneal tissue creates an unnatural, irregular shape of the cornea which increases the higher order aberrations of the eye. Symptoms of HOA include starbursts, halos, double vision, multiple images and smeared vision. Irregular astigmatism can be a significant obstacle for achieving satisfactory QOV. Higher-order wavefront aberrations of the cornea were calculated by video keratography. Coma, spherical aberration and trefoil are the most common aberrations induced by LASIK. In this study; we evaluated correlation of post Lasik higher order aberration and their impact on quality of life.

Methodology:

A prospective comparative eye study included subjects having LASIK for the correction of myopia or myopic astigmatism at Laser Refractive Department, Ahmedabad, between June 2015 to march 2016. Subjects were enrolled after signing an informed consent form & the nature of surgery explained before the surgery. The study was approved by the local ethical committee and was performed in accordance with ethical standard. A prospective study comprised of 29 subjects (58 eyes) underwent LASIK for the treatment of myopia or myopic Astigmatism with. In all cases, bilateral LASIK was conducted and an optic zone of 6.5mm.

Inclusion criteria for the study were age 18 to 35 years, stable refractive error with -1.0D to -9.0D of spherical myopia, astigmatism between 0.00D to -2.75D, The manifest Refraction Spherical Equivalent [MRSE] mean was $-4.33D \pm 1.96SD$ and distance visual acuity correctable to 0.0 log Mar or better.

Exclusion criteria were presence of significant dry eye, anterior segment abnormalities (i.e., cataracts, corneal scarring, or neovascularization within 1 mm of intended ablation zone), basement membrane disease, history of recurrent corneal erosion, progressive or unstable myopia, estimated post-operative residual stromal bed thickness of less than 250um, established or forme fruste keratoconus, macular or retinal disease, current use of systemic corticosteroid or immunosuppressive therapy, autoimmune disease, collagen vascular disease, Diabetes mellitus, pregnancy and lactation.

The preoperative Examination of each subject included uncorrected distance visual acuity (UCDV) using a standard Snellen eye chart, corrected distance visual acuity (CDVA) (with spectacles), manifest Refraction, cycloplegic refraction with cyclopentolate 1.0%, post mydriatic testing at least 72 hours after cycloplegic refraction, intraocular pressure measurement, slit lamp biomicroscopy of anterior segment, dilated fundus evaluation, corneal topography with atlas 9000 corneal topographer, wavefront Report analysed by schiempflag imaging with ziemer Galilei g4. contact lens users were asked to discontinue lens wear 2 weeks before screening for soft contact lenses and 6 weeks before rigid gas-permeable contact lenses. Manifest refraction and wavefront measurement were repeated at 2 visits to ensure refractive stability.

Eligible subjects were scheduled for bilateral wavefront -optimized Lasik. The correction target was based to manifest refraction, with emmetropia being the target in all subjects. Mechanical microkeratome used to create corneal flaps during study.

Postoperatively, the subjects were examined at 1 day, 1 week, 1 month, 3 month and 6 month. All post operative follow-up visits included measurement of UDVA, CDVA (if indicated), corneal wavefront report with Galilei G4 (dual schiempflag) same as preoperatively.

For the assessment of vision-related QOL, National Eye Institute Visual Functioning Questionnaire 22 (NEI-VFQ 25) was translated into Gujarati. After the validation study, the influence of Lasik surgery on QOL was investigated. We have assessed QOL questioner postoperatively 6 month of Lasik. Subjects were requested to answer all questions on 4 Point response scale.

The aim of this study was to evaluate post Lasik corneal higher order aberrations & how LASIK affects QOL and to identify factors that may affect satisfaction after LASIK.

Result:

Statistical Analysis was done using Microsoft office software. The study comprised 29 subjects (58 Eyes). Below table shows mean values \pm SD, Comparison of preoperative and 6 month-post operative corneal higher order Aberrations

	Pre Lasik	Post Lasik	P value
RMS	0.37±0.45	0.44± 0.52	2.686E-12 (<0.01)
SA	0.04±0.06	0.11± 0.14	7.15131E-16 (<0.01)
COMA	0.09±0.11	0.12± 0.16	1.48E-05 (<0.01)
TREFOIL	0.05±0.06	0.09± 0.11	0.000838 (<0.01)
DEFOCUS	0.16±0.19	0.30±0.39	2.58E-25 (<0.01)
ASTIGMATISM	0.34±0.40	0.27±0.33	0.007465 (<0.01)

Table:1

RMS=Total Root mean square. SA= spherical Aberration.SD= standard DeviationPre LASIK the Total root mean square, Spherical Aberration, Coma ,Trefoil, Defocus and Astigmatism mean value were [mean (μm) \pm SD] 0.37±0.45, 0.04±0.06, 0.09±0.11, 0.05±0.06, 0.16±0.19, 0.34±0.40 respectively and post LASIK mean were [mean (μm) \pm SD] 0.44± 0.52, 0.11± 0.14, 0.12± 0.16, 0.09± 0.11, 0.30±0.39, 0.27±0.33 found ($p<.001$).

Post Lasik ,86.2% found their life be with large difference for better. hobbies that require you to see well up close, such as cooking, fixing things around the house, sewing, using hand tools, or working with a computer 79.31% found No Difficulty. 62.06% had no difficulty in seeing because of changes in the clarity of their vision over the course of the day.96.55% had no difficulty in judging distances, like walking downstairs or parking car. 55.17% found no difficulty in dark adaptation. 93.10% had no difficulty in reading ordinary print in newspaper.82.75% had no difficulty in reading small print in a telephone book, on medicine bottle or on legal forms.51.72% had found no difficulty & 41.37% had a little difficulty in driving at night. 48.27% had no difficulty & 48.27% had a little difficulty in driving in difficult conditions such as, in bad weather, during rush hour, on the freeway , or in traffic.86.20% had no difficulty in taking part in active sport or other outdoor activities. 99% had no need to wear glasses or bi-focal lenses or use a magnifier when they were reading something long, like a book, a magazine article, or the newspaper. 96.55% had no need to wear glasses or contacts when driving at night.96.55% had no need to wear glasses or contacts at dusk, when it is starting to get dark.41.37% had most of the time and 31.03% had some of the time seen starbursts or halos around the light that make it difficult to see. 51.72% had none of the time and 31.03% had some of the time experience pain or discomfort in and around their eyes. 27.58% had a very little dryness & 58.62% had don't felt dryness. 62.06% had never bothered by changes in the clarity of vision over the course of the

day. 37.93% had occasionally worried and 31.03% had never worried about their eyesight after Lasik surgery. 62.06% had having perfectly clear vision & 24.13% had having pretty clear vision after LASIK surgery. 62.06% had completely satisfied & 34.48 % had somewhat satisfied after LASIK. 62.06% had completely dissatisfied in term of appearance with their glasses, contact lenses. 27.58% had tacking less part in active sports or outdoor activities after LASIK.

Discussion:

In the present study, we observed the changes in spherical aberration, coma, trefoil, defocus, Astigmatism & total root mean square of aberrations preoperative and 6 month post LASIK then evaluated the subjects' satisfaction about the daily visual functions & quality of life after LASIK through questionnaire.

Muhammad Siam Khan observed Effect of wavefront optimized LASIK on higher order aberrations in myopic subjects. HOAs were measured with aberrometer (Wave light allegro analyzer version 1073) during preoperative assessment and one month after surgery. They found significantly increasing in the RMS of Total HOAs and Uncorrected visual acuity (UCVA) was improved to 0.00 or better in all 60 eyes after wavefront optimized LASIK.

Majid Moshirfar, MD, Joshua A. Schliesser compared visual outcomes between wavefront-guided photorefractive keratectomy (PRK) and wavefront-guided laser in situ keratomileusis (LASIK). At 6 month The mean postoperative HOA root mean square was $0.45 \pm 0.13 \mu\text{m}$ in the PRK group and $0.59 \pm 0.22 \mu\text{m}$ in the LASIK group with the mean UDVA was $-0.03 \log\text{MAR} \pm 0.10 [\text{SD}]$ (20/19) and $0.07 \pm 0.09 \log\text{MAR}$ (20/24), respectively.

David Smadja, MD; Marcony R. Santhiago analyzed the induced corneal higher order aberrations (HOAs) after wavefront-optimized ablation in sixty four eyes and concluded that The magnitude of the induced corneal HOAs was related to the amount of intended correction. Corneal wavefront profiles do not reflect the visual performance.

Although several clinical trial found increasing corneal higher order aberrations and better visual acuity after LASIK. In our study after LASIK the total Root mean square of corneal HOAs found $0.44 \mu\text{m} \pm 0.52 \text{SD}$ with The UDVA was 0.0 Log MAR or better.

Postoperative residual MRSE mean was $-0.09\text{D} \pm 0.16\text{SD}$. We have similar results with several clinical trial. In this study with increasing corneal HOAs with better visual acuity 51.72% had found no difficulty & 41.37% had a little difficulty in driving at night and only 3.44% only have moderate difficulty at night and only 8.60% have seen halos around the light at night. Majority of subjects with life be with large difference with better, no difficulty in near and intermediate work, dark adaptation, outdoor activities. A large improvement in QOL after Lasik Refractive Surgery for myopia. Corneal wavefront profiles do not reflect the visual performance. We have to observe ocular aberration also.

Conclusion:

Total Corneal Higher order Aberrations increasing after LASIK. Even With increasing corneal HOAs quality of life & visual outcome is maintained up to the requirements of subject's expectation level.

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13 Original article

OUTCOME OF CALCANEAL FRACTURE TREATED CONSERVATIVELY, PERCUTANEOUS SCREW FIXATION AND WITH PLATING & BONE GRAFTING

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Abstract

Background: 75% of calcaneal fractures are intra articular. Treating calcaneal fractures is a challenge for orthopaedic surgeon due to the complex fracture pathology. A wide range of treatment options varying from non operative to operative methods are available. The purpose of this study is to assess the functional outcome of conservatively treated and operatively managed intra articular calcaneal fractures.

Methods: 20 intra articular fractures have been classified as per Computerized Tomography based Sanders system.7 fractures were treated conservatively.11 fractures were treated with open reduction and internal fixation with bone grafting and plating. 2 fractures were treated with percutaneous screw fixation. Functional outcome was assessed using Modified Rowe score after following the cases over mean period of 12 months.

Results: In conservatively managed 7 fractures, average functional outcome score was excellent in 2 Sanders Type-I fractures, average functional outcome score was good in 3 Sanders Type –II fractures and was poor in 2 Type-III Sanders fractures. In percutaneously fixed 2 cases of Sanders Type –II intra articular fractures by screws, average functional outcome score was good. In fractures fixed with open reduction and internal fixation with bone grafting and plating, average functional outcome score was excellent in 6 Sanders Type-II fractures and good in 5 Sanders Type-III fractures.

Conclusion: Sanders Type-I fractures can be treated conservatively with excellent functional outcome. Managing Sanders Type II and III conservatively results in good to poor outcome. Hence for Sanders Type-II and Type-III, Open reduction and internal fixation with plating and bone grafting has to be considered for achieving excellent functional outcome. Percutaneous screw fixation can also be considered which yields good functional outcome and less post operative complications.

Key words: Calcaneum, conservative treatment , plating, percutaneous screws, Sanders classification, Modified Rowe scale

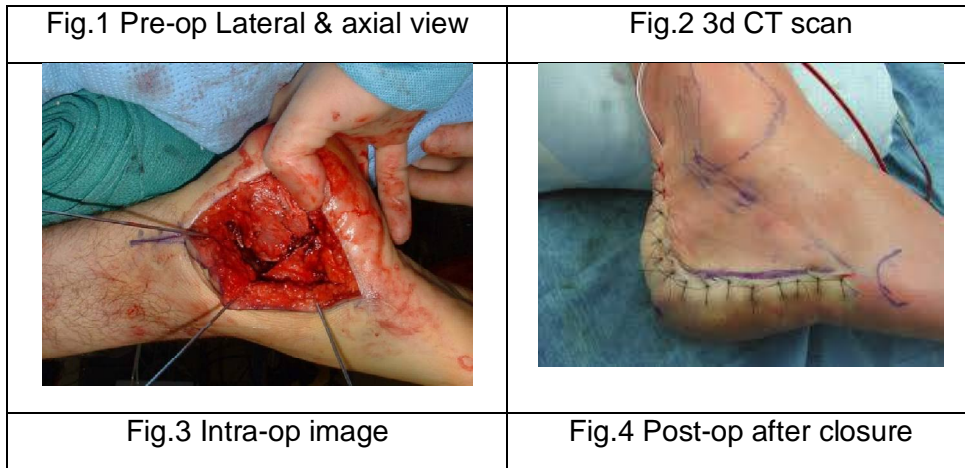
1. Introduction

Calcaneum fractures account for 2% of all fractures, 60% of tarsal bone fractures. 10% of fractures are bilateral and 75% are intra articular. 10% of fractures are associated with vertebrae fractures. Mechanism of injury in majority of patients is axial loading i.e. fall from height. Other mechanisms are brake pedal injuries and high velocity trauma. Current development in imaging technology has allowed better understanding of this complex fracture pathology. Sanders classification of intra articular Calcaneum fractures is widely used now a days because of its proven correlation with management and prognosis. Treating Calcaneum fractures is a challenge for orthopaedic surgeon. Treatment options ranges from non operative to operative methods. This study has been carried out with the aim to assess the functional outcome of conservatively and operatively managed intra articular calcaneal fractures.

2. Materials And Methods

There were 20 intra articular calcaneal fractures in 20 patients between March 2016 to December 2016. Immediate below knee slab, anti-edema drugs and elevation followed by hot water bath after 2nd admission day given. Pre-op antibiotics was given of 1 gm Ceftriaxone and pre-anaesthetic check-up was done. Patients were evaluated clinically and radiologically, lateral (Fig.1), axial (Fig.1) radiographs of Calcaneum were taken. A routine pre operative Computerized Tomography (Fig.2) was taken. Sanders system was used for classifying intra articular fractures. 7 intra articular fractures (35%) which had poor local condition, medically unfit patients, peripheral vascular disease and patients who are unwilling for surgery have been treated conservatively with limb elevation and immobilization in plaster for 12 weeks. 11 intra articular fractures (55%) were fixed internally under fluoroscopic guidance on an average in 7 days of injury once wrinkle sign is positive. The aim of treatment was to achieve articular surface reconstruction, to restore height, width of axis of heel by performing primary osteosynthesis. In surgically treated fractures, percutaneous screw fixation was done for 2 intra articular fractures (10%). Extensile lateral approach (Fig.3) with ipsilateral iliac crest graft was used to fill the defect after elevating the depressed posterior articular facet in all cases which were internally fixed with plating. Axial and Broden views were assessed under fluoroscopy intra operatively. Satisfactory reduction was achieved in all cases. Post operatively limb elevation was maintained for 2-3 days. Compressive bandage was applied over sterile dressing. Complete suture removal was done at an average of 18 days. All operated patients were kept on absolute non weight bearing for 6 weeks followed by touchdown weight bearing with active and passive movements of ankle and sub talar joints. Full weight bearing was allowed from 12 weeks. Regular clinical follow up examination was performed monthly in all cases and functional outcome was assessed by using Modified Rowe scale after following the cases over a mean period of 12 months.





3. Results

There were 20 intra articular fractures in 20 patients which were operated between March 2016 to December 2016. 7 intra articular fractures (35%) were treated conservatively. 13 intra articular fractures (65%) were surgically managed. Percutaneous screw fixation was done for 2 intra articular fractures (10%) and open reduction and internal fixation with locking plates with bone grafting was done in 11 intra articular fractures (55%). Mean patient age was 32 years.18 patients were male (90%) and 2 were females (10%). Right Calcaneum was involved in 12 cases (60%), 8 cases (40%) had left Calcaneum fracture. As per Sanders classification Type-I fractures were 2(10%), Type-II were 11(55%), Type-III were 7(35%).Out of 2 Sanders type-I fractures, all (100%) were treated conservatively. Out of 11 Sanders Type-II fractures 3(27.27%) were treated conservatively, 2(18.18%) with percutaneous screw fixation, 6(54.54%) with open reduction and internal fixation with plating and bone grafting. Out of 7 Sanders type-III fractures, 2(28.6%) were treated conservatively and remaining 5(71.4%) were operated with open reduction and internal fixation with plating and bone grafting.In conservatively managed 7 fractures-average functional outcome score was excellent in 2 Sanders Type-I fractures, average functional outcome score was good in 3 Sanders Type –II fractures and was poor in 2 Type-III Sanders fractures. In percutaneously fixed 2 Sanders Type –II intra articular fractures by screws, average functional outcome score was good. Average functional outcome score was excellent in 6 Sanders Type-II fractures and good in 5 Sanders Type-III fractures fixed with open reduction and internal fixation with bone grafting and plating. In patients treated with open reduction and internal fixation with plating and bone grafting wound dehiscence was seen in 1 patient (5%) which was healed with clean compressive dressings and intravenous antibiotics. No other complications were observed.

Modified Rowe score: Excellent >85

Good 70-85

Satisfactory 55-70

Poor <55

		Conservative Management		Operative Management (percutaneous screw fixation)		Operative Management (ORIF with plating and bone grafting)	
	Total no. of patients	7		2		11	
Sanders Type	Total no. of patients	No. of patients	Average Modified Rowe Score	No. of patients	Average Modified Rowe Score	No. of patients	Average Modified Rowe Score
I	2	2	86	0	-	0	-
II	11	3	80	2	75	6	87
III	7	2	50	0	-	5	80
IV	0	0	-	0	-	0	-

4. Discussion

Intra-articular fractures account for approximately 75% of calcaneal fractures and are commonly associated with other axial load injuries giving rise to lumbar vertebral fractures. Mechanism of injury of the Calcaneum fracture causes a major soft tissue injury that includes heel pad, skin and other soft tissues. Lateral, axial and Broden view radiographs are used to examine calcaneal fractures. CT diagnostic provided improved understanding of calcaneal fractures and led to a clinically relevant classification of these injuries. CT evaluation of calcaneal fractures has allowed classification systems to offer prognostic significance. The treatment goals are: (1) restoration of congruency of the posterior facet of subtalar joint,(2) restoration of the calcaneal height and width,(3) decompression of the sub fibular space available for the peroneal tendons, (4) realignment of the tuberosity in a valgus position, and (5) reduction of the calcaneocuboid joint. To correct calcaneal anatomy, open reduction should be advised to patients. We used the lateral extensile approach¹⁵ because it provides wide exposure of the subtalar joint and allows more accurate exposure of the facet fragments and calcaneocuboid joint, easier decompression of the lateral wall, and sufficient area laterally for plate fixation. Bone grafting is essential to prevent collapse and maintain the height of Calcaneum and to add mechanical support and to probably stimulate earlier fracture healing. Use of percutaneously screw fixation¹⁸ with minimum soft tissue dissection can be opted which also results in less post operative swelling and considerably yields good functional outcome. The functional outcome in our study was assessed by using Modified Rowe scale.

5. Conclusion

Sanders Type-I fractures can be treated conservatively with excellent functional outcome. Managing Sanders Type II and III conservatively results in satisfactory to poor outcome. Hence for Sanders Type-II and Type-III, Open reduction and internal fixation with plating and bone grafting has to be considered for achieving excellent functional outcome.Percutaneous screw fixation can also be considered which yields good functional outcome and less post operative complications.

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14 Original article**A STUDY OF EFFECT OF SWIMMING ON BREATH HOLDING TIME****Dr.Devanshi Upadhyaya*, Dr Janardan V Bhatt**,**

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Abstract: -Introduction: - swimming is a kind of sport which involves the movement of most of the muscle of human body in an environment different from other sports activity. Swimming is a kind of exercise which requires brief or long durations of breath holding in water. Aims and objective:-The purpose of this study was to find the effect of swimming on breath holding capacity of the swimmers. Approach: - We carried out a comparative study of breath holding in swimmers of Ahmedabad city and the persons of sedentary life style. The data obtained were compiled, statistically analyzed and compared with the control group using unpaired 't' test. Results:-Our results showed statistically significant higher breath holding time in the swimmers than sedentary person. Conclusion: - our study reaffirms the advantages of swimming; it is an advisable exercise to improve respiratory efficiency.

Key-words: swimming, Breath holding

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Introduction: Breathing technique is the most important part of swimming. Swimmers try to inhale after every three or four strokes. Jane

Cappaert, a sports science bio-mechanist with the Olympic swimming team, says that swimmers will improve their training by staying underwater for as long as they can. "It will help them maximize their oxygen consumption from each breath" This is called hypoxic training and it seems to translate into better performance when a swimmer is low

on oxygen during a race or another hypoxic exercise is to swim freestyle, holding your breath for six strokes, then increasing it to seven, on up, in order to put you in that hypoxic state^I. Swimming is unique kind of exercise and a sport which is carried out in a different environmental condition than other forms. The effect of gravity, shifting of centre of mass of human body and the buoyancy of water play a major role. Human body by achieving muscular efficiencies naturally accomplish this act of swimming^{II}.

Exercise like swimming is of low intensity but of long duration produces increase in the number of mitochondria in the muscle fibers that are recruited in it. In addition there is increase in the number of capillaries around these fibers. All such changes lead to increase in the capacity for endurance activity with minimum of fatigue^{III}. Swimming differs than other sports activity due to horizontal position of the body, higher amount of humidity, restricted ventilation under water and increased external pressure. Heat loss from the body is also very fast due to higher specific

heat and conductivity of water. The pressure exposed to diaphragm is also greater during swimming than running^{IV}.

Considering these facts we tried to check the positive effect of swimming on breath holding capacity of the swimmer by comparing with those of the sedentary person.

Material and Methods::In the present study 35 subjects selected were residents of Ahmedabad city who had been swimming for last 2- 6 years or more, who routinely performed for 2-3 hours a day, minimum of 5 days a week. The study was carried out at the eklavya sports complex situated at thaltej, Ahmedabad before starting their routine warm up before swimming^V; i.e. in resting state. The control population was represented by untrained persons.

All the subjects were male between the age group of 20 – 38 years. The subjects were explained the purpose and importance of study. Only those who were motivated consented and without past history and family history of Diabetes Mellitus, HTN, IHD, TB, Asthma etc. were included in the present study. Also the subjects were not having any personal history of tobacco and alcohol consumption. They were free from any disease and were not taking any medicine at the time of evaluation.

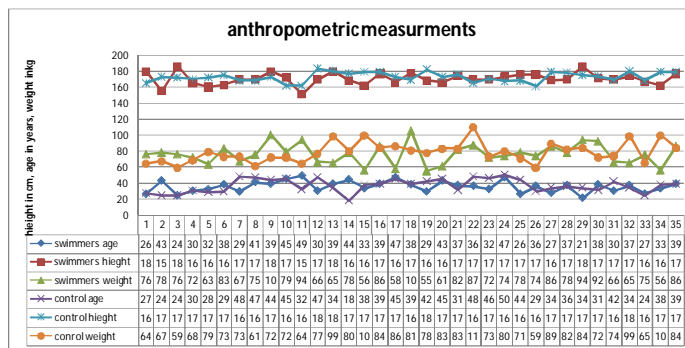
With the similar criterion 35 male persons of same age group of Ahmedabad city who were not involved in any sports activity or regular daily exercise like walking, cycling, jogging etc. were taken as controls.

Proper clinical examination and anthropometric measurements were taken before starting the breath holding tests to avoid human error.

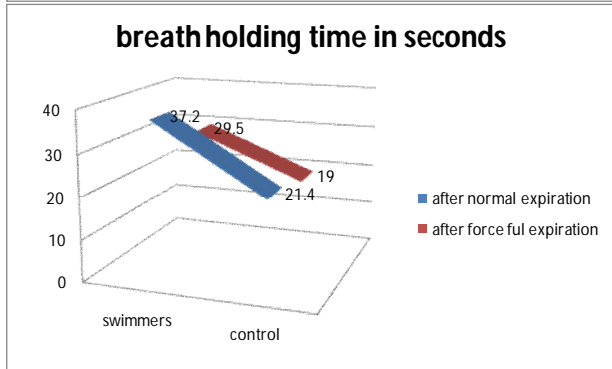
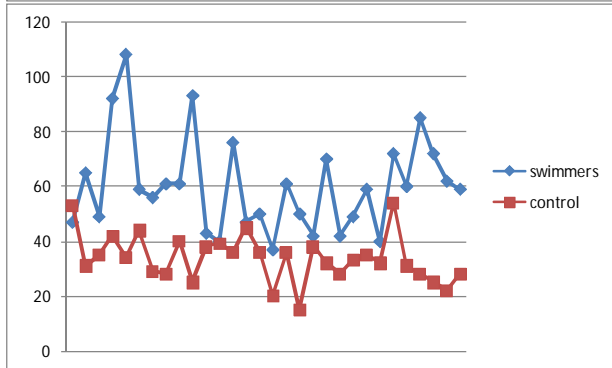
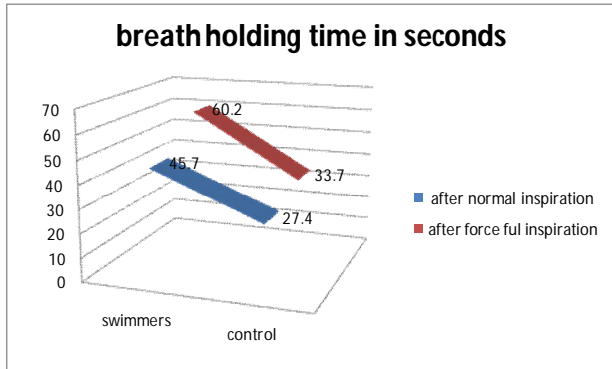
All the participants were explained the methodology. Respiratory parameters were taken in the morning time 8 am to 10 am in the month of September-October 2015 to avoid diurnal variations.

The subjects were instructed to perform following maneuvers using stop watch in sitting position.^{VI,VII} Breathe holding for the maximum duration which is possible i.e break point (unable to hold more than that).^{VIII}

Breath holding was done after normal inspiration, normal expiration, maximal possible deep inspiration and maximal possible expiration. Recording was done using stop watch in seconds. The data was analysed using unpaired't' test and the results were consider statistically significant where p values were less than 0.001.



Result:



Breath holding time	swimmers		control		unpaired 't' test
	mean	sd	mean	sd	pvalue
After normal inspiration	45.7	7.1	27.4	5.4	<0.001
After force full	60.2	12.1	33.7	8.3	<0.001

inspiration					
After normal expiration	37.2	5.6	21.4	4.1	<0.001
After force full expiration	29.5	3.7	19	3.1	<0.001

Discussion: on analyzing the results in our study we found that there was no significant difference in the anthropometric measurement. Breath holding tests showed the results as per above charts, which clearly shows significantly higher mean values in swimmers than that of control subjects.

Vijendra rathi found similar results in his study in swimmers of Gwalior both male and female. He attributed it to larger lung volumes.^{vi}

Bowers and foss^{ix} in his book “The physiological of physical education and athletics” and Mehrotra et al showed that regular exercise has proved to be beneficial for the human body and the lungs are no exception. The results of his study indicate that all the sportspersons had a higher value of lung functions compared to the Controls^{iv}. They attributed it to release of lung surfactant and prostaglandin in to the alveolar space which increases the lung compliance and decreased bronchial smooth muscle tone due to maximal and prolonged inflation and deflation.

Similar results were found in swimmers of different studies carried out in different places^{x,xi}. They have explained it on the basis of longer duration of underwater swimming and breathing exercise.

Armour J et al contradicted the above suggestion in different studies but suggested that elite swimmers develop physically wider chest containing an increased number of alveoli rather than increased size^{xiv}.

Another similar activity of breathing exercise is yoga and it different modalities. R Aravind ET al^{vii} in their study on medical students for breath holding had found similar results suggested of increased breath holding after normal inspiration. Wallace RK et al explained the reason as decreased oxygen consumption.^{xii}

M j parkes in his article explained break point is a condition in which voluntary breath holding is overridden by the involuntary act of breathing. He explained that it is not only because of chest movements, partial pressure of gases or peripheral chemo receptors; it is also related to change in metabolic rate, central respiratory rhythm and feedbacks from diaphragm^{viii}.

Ethnic, genetic, climatic, social, mental and various other condition also play a significant role in the performance and out-come of the test.^{xiii,xiv}

Conclusion: our study reaffirms the fact that regular swimming has a positive effect on the breath holding and can be of help to improve the respiratory reserves. But to have deeper understanding further studies with multiple parameters must be carried out.

Acknowledgment:

I pay my thanks to Department of Physiology, AMC-MET Medical College, Ahmedabad for their help at every step of the study. I also wish to thank authorities of Eklavya sports complex for allowing me to use their premises for this study. I am also grateful to my subjects who in spite of their busy schedule have given us their precious time gave consent and active participation in this study.

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15 Original article

EARLY DETECTION OF DENGUE FEVER IN CLINICALLY SUSPECTED PATIENTS - AN ULTRASOUND STUDY

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ABSTRACT

Background: Dengue is a mosquito-borne infection that in recent years has become a major international public health problem.

Purpose: This study was conducted to assess the sonographic findings in patients with dengue fever.

Methods: A total of 112 patients who were clinically suspected of dengue underwent abdominal sonography on admission at our emergency department . The diagnosis of dengue fever was subsequently confirmed by serology in 86 patients. The study was conducted from September 2016 to January 2017 using LOGIC P5 USG machine at LG hospital, Ahmedabad.

Results: Out of the 86 patients seropositive for dengue ,the sonographic feature of thickened gall bladder wall was noted in a total of 53 patients (61%). Gall bladder wall thickening as the only finding was noted in 12 patients (14%). The maximum thickness noted was 6.3mm and the smallest thickness noted was 2.4mm. Average thickness of the gall bladder was 3.4 mm ± 1mm. Other ultrasound findings such ascites was noted in 21 patients (24%), splenomegaly in 11 patients (12.7%), and pleural effusion in 23 patients (26%); pleural effusion was either right-sided or bilateral. Pleural effusion as the only finding was noted in 12 patients. In 21 sero positive patients (24%) no significant ultrasound findings were seen. 26 patients were seronegative and showed no significant ultrasound findings.

Conclusion: Abdominal sonography for gall bladder wall thickening can be used as a first-line imaging modality in patients with suspected dengue fever to detect early signs suggestive of the disease prior to obtaining serologic confirmation test results, especially in a dengue fever epidemic area. Sonographic examinations are useful as an additional diagnostic tool for the prediction of dengue fever. A thickened gallbladder wall is a useful sonographic finding that can help in the detection.

Early detection of dengue has a significant role in reduction of morbidity and mortality with better prognosis.

INTRODUCTION

Dengue is a mosquito-borne infection that in recent years has become a major international public health problem. Dengue fever (DF) is an acute febrile viral disease caused by flavivirus. It occurs in two forms: DF, a milder form of the disease and dengue hemorrhagic fever (DHF), the most severe form.

Dengue has become a major international public health concern in recent years. It is now endemic in more than 100 countries and threatens the health of 40% of the world's population.¹ DF is widely distributed in many countries in Southeast Asia, Central and South America, and the Western Pacific regions. The incidence of DF has increased 30-fold in the last four decades, and more than half the world's population are now threatened with infection from dengue virus (DEN).²

It is estimated that 50 million dengue infections occur each year with 500,000 cases of dengue hemorrhagic fever (DHF) and at least 12,000 deaths annually mainly among children.¹ The increase of DF is due to uncontrolled population growth and urbanization in the absence of appropriate water management, global spread of dengue strains via travel and trade and due to erosion of vector control programmes.³

In subtropical countries like India dengue fever is a major cause of morbidity and mortality during the monsoon season. The problem is even more acute because since 1963, more than 50 outbreaks have been reported by the National Institute of Communicable diseases, New Delhi.⁴

Dengue viruses are transmitted to humans through the bites of infective female *Aedes* mosquito. *Aedes aegypti* mosquitoes that transmit the disease breed in man-made containers such as tanks, pitchers, discarded containers etc. in which water has stagnated for over a week. Thus, the success of control measures have become a reflection of sanitation and hygienic practices achieved.

Dengue has myriad clinical manifestations with unpredictable evolution and outcome. The disease typically begins with an acute febrile phase lasting 2-7 days and is accompanied by flushing, generalized body ache, myalgia, arthralgia and headache. Increased capillary permeability reflected by progressive increase in hematocrit heralds the beginning of critical phase at around 3-7 days of illness. Severe hemorrhagic manifestations and shock secondary to plasma leakage may occur at this stage. Leukopenia and declining platelet counts are also seen preceding this stage. The incubation period of the disease may range from 3 to 14 days. The onset of the disease is recognized by the sudden onset of high fever, retro-orbital pain, thrombocytopenia and haemorrhagic manifestations. Common laboratory findings include pancytopenia, neutropenia, increased haemoconcentration, thrombocytopenia and prolonged bleeding time. These findings are consistent with increased vascular permeability, plasma leakage, abnormalities of haemostasis and protein losing shock syndrome, which commonly occur in DF pathogenesis.

Serology is the mainstay in the diagnosis of DF. Haemagglutination inhibition antibodies usually appear at detectable level by day 5 to 6 of febrile illness. The diagnosis of DF is often delayed owing to time taken for availability of results.

Ultrasonography is a non invasive, safe, low cost dynamic imaging modality which does not utilize ionizing radiation.

The aim of our study was to evaluate the ultrasound findings in DF, to find whether ultrasound of the abdomen is an important adjunct to clinical and laboratory profile in diagnosing DF.

Although not specific, the sonographic findings in DF are obtained more rapidly than the results of serologic tests.

MATERIALS AND METHODS

The study was a single centred cross-sectional study performed in tertiary care hospital from September 2016 to December 2016.

Patients who were clinically suspected of dengue underwent abdominal sonography on admission at our emergency department. Then they were subjected to serological testing and patients who were proven to be positive for dengue fever by immunological assay for non-structural protein 1(NS1) antigen were included in the study.

The ultrasound of abdomen and chest of the 112 patients was performed. Then the patients were advised 6 hours of fasting to allow better distension of gall bladder (GB) followed by ultrasound examination by the consultant radiologist the next day. The abdomen and pelvis ultrasonography was done to look for free fluid in the peritoneal cavity, gall bladder wall thickening and pericholecystic collection. The chest ultrasonography was done to look for pleural effusion.

All ultrasound examinations were performed with LOGIC P5 using 10 MHz linear probe and 2.5-5 MHz convex probes.

GB wall thickening was measured by placing the calipers between the two layers of the gall bladder wall. The thickness was measured at the region of maximum wall thickening.^{14,17}

Thoracic scanning was done in supine posture and in sitting posture. Both the pleural spaces were evaluated through an intercostal approach.

Size of the spleen was measured along its long axis from the upper pole to lower pole.^{15,16}

We conducted the study in accordance with all local ethical standards, and oral informed consent to participate was obtained from all patients before their enrollment.

OBSERVATION AND RESULTS

A total of 112 patients were taken in our study. Among them, 60 patients were male and 52 patients were female. 52 patients were under 15 years of age, 39 were between 15 to 30 years and 21 were above 30 years of age.

Out of these 112 patients, 26 patients were seronegative and showed no significant ultrasound findings.

A total of 86 patients were seropositive for dengue. Among them 65 patients had one or more ultrasound findings, as follows.

The maximum gall bladder wall thickness noted was 6.4 mm and the minimum gall bladder wall thickness noted was 2.3 mm. Average thickness of the gall bladder was 3.4 mm \pm 1mm. Out of this, thickened gall bladder wall (>3mm) was noted in a total of 53 patients(61%). Gall bladder wall thickening as the only finding was noted in 12 patients. Along with gall bladder wall thickening, other ultrasound findings such as ascites was noted in 21 patients (24%), splenomegaly in 11 patients (12.7%), and pleural effusion in 23 patients (26%); pleural effusion was either right-sided or bilateral.

Pleural effusion as the only finding was noted in 12 patients. In 21 sero positive patients (24%) no significant ultrasound findings were seen. Thus Ultrasound findings were negative in 24% of the seropositive patients.

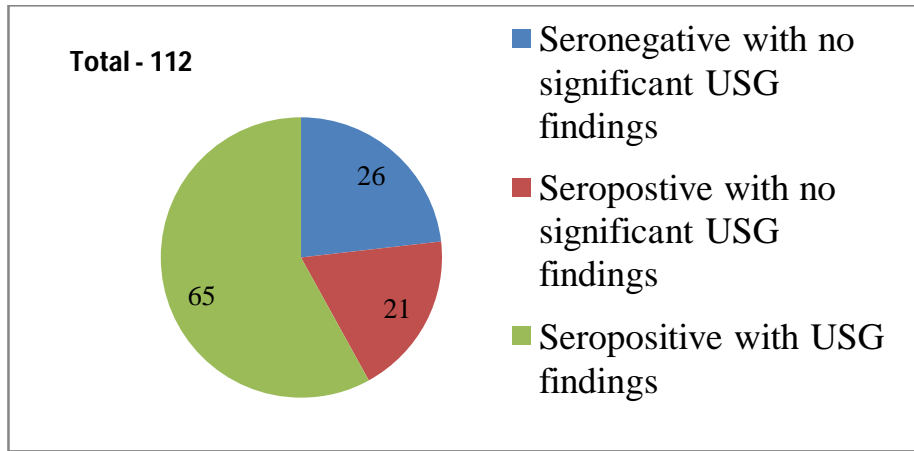


Table 1 -GENDER WISE DISTRIBUTION OF CLINICALLY SUSPECTED PATIENTS FOR DENGUE

	Male	Female	Total	%
Seronegative with no significant USG findings	15	11	26	23
Seropositive with no significant USG findings	13	8	21	18
Seropositive with USG findings	34	31	65	58
Total	62	50	112	

Table 2 - AGE DISTRIBUTION OF PATIENTS CLINICALLY SUSPECTED FOR DENGUE

Age group	Male	Female	Total	%
< 15	30	22	52	47
15 – 30	21	18	39	33
30 – 45	7	8	15	14
>45	4	2	6	5
	62	50	112	

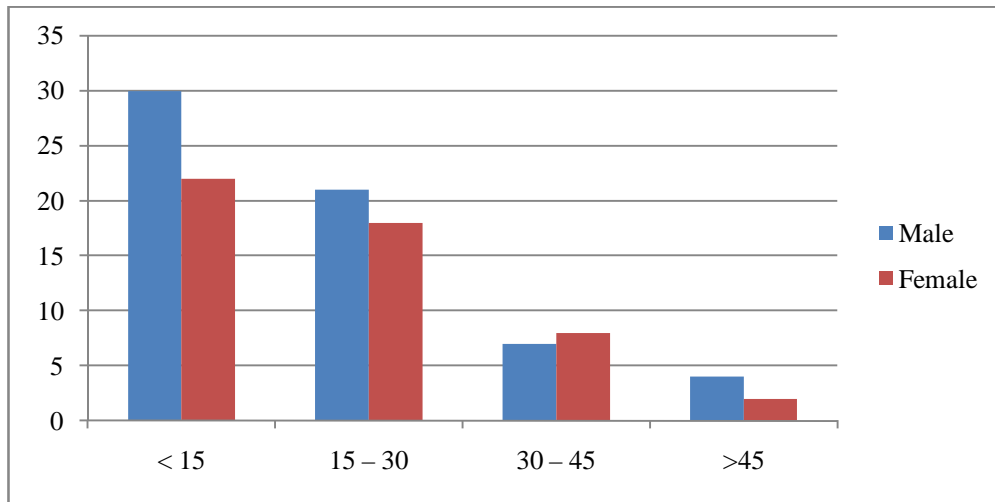


Table 3 - BASED ON USG FINDINGS

USG Findings	Male	Female	Total	Percentage
GB wall thickening as the only finding	7	5	12	14%
GB wall thickening with ascites	9	12	21	24%
GB wall thickening with splenomegaly	7	4	11	12%

GB wall thickening with pleural effusion	6	3	9	11%
	29	24	53	61%

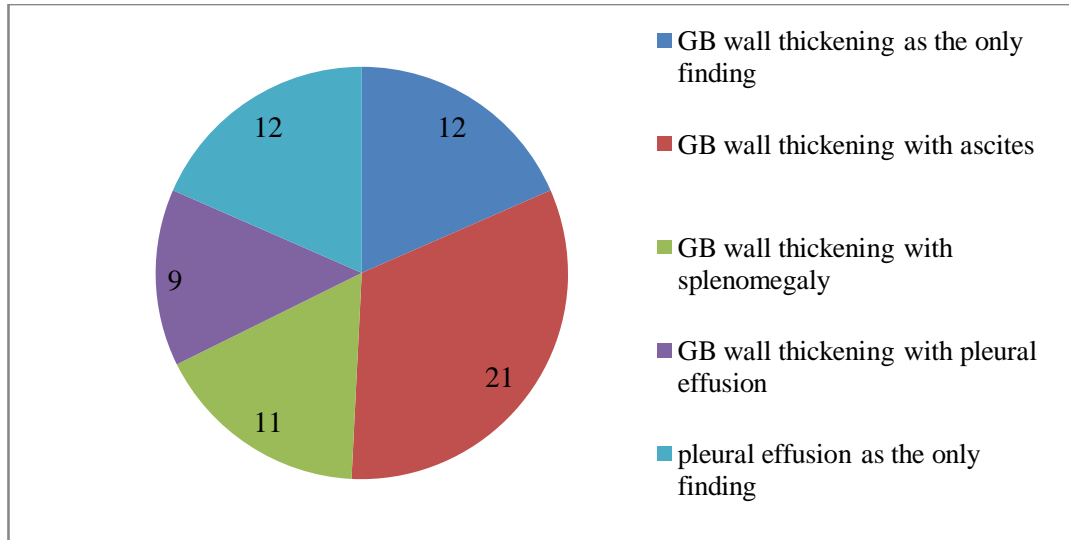


Table 4 – RANGE OF GB WALL THICKNESS.

GB wall thickness range	Male	Female	Total	%
3 – 3.9 mm	15	8	23	43
4 – 4.9 mm	9	9	18	33
>5mm	5	7	12	23

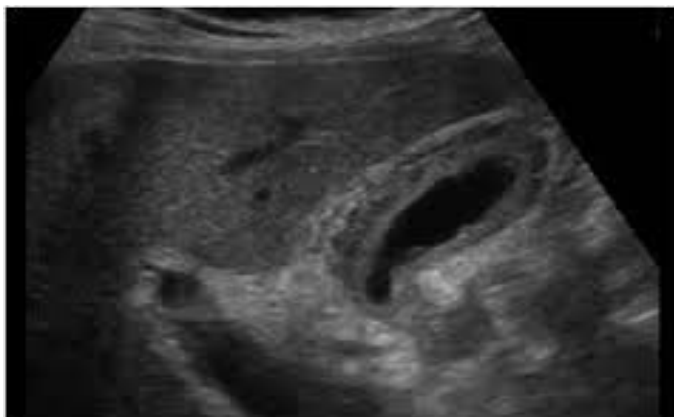
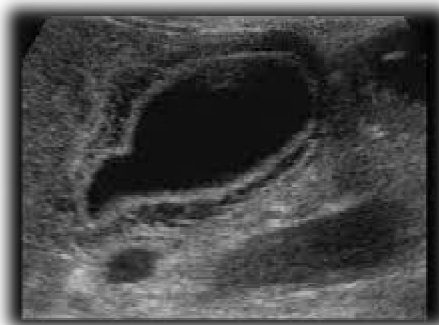
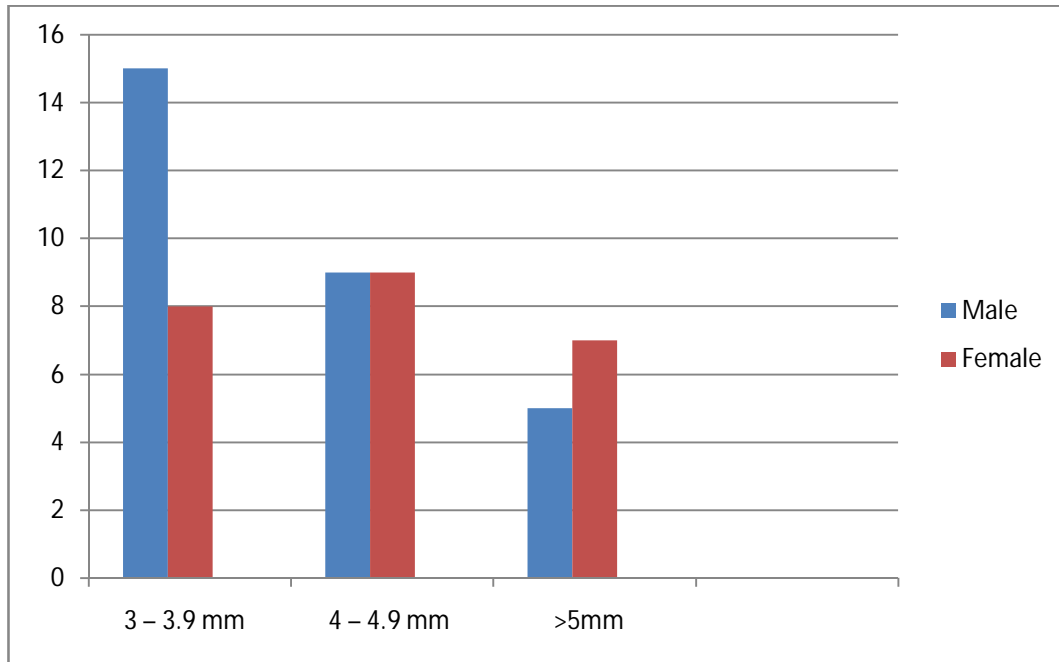


Fig 1,2,3 – Ultrasound images of oedematous gall bladder wall

DISCUSSION

In our study, 61% of the seropositive patients showed gall bladder wall thickening. Hence this was the most persistent finding. Other common findings were pleural effusion and ascites. Along with gall bladder wall thickening, other ultrasound findings such as ascites was noted in 24% , splenomegaly in 12.7%, and pleural effusion in 26%; pleural effusion was either right-sided or bilateral. Pleural effusion as the only finding was noted in 12 patients. In 21 sero positive patients (24%) no significant ultrasound findings were seen.

Our study findings are in accordance with Santhosh et al who concluded in their studies that gall bladder wall thickening being the most frequent finding.⁸

Thulkar et al reported sonographic findings in 40 patients with dengue hemorrhagic fever, including pleural effusion, ascites, and gallbladder wall thickening; splenomegaly was not mentioned.⁵

Setiawan et al states that increased gall bladder thickening associated with increased severity of disease.¹² Also in the study by Venkata Sai and Krishnan R who concluded that during an epidemic of dengue, presence of thickened gall bladder wall, pleural effusion and ascites strongly favour the diagnosis of dengue fever, similar to our findings.⁷

Tai et al found that sonographic findings of DF were a thickened gallbladder wall, ascites, splenomegaly, and pleural effusion, which were confirmed in our study.²⁰

In another study conducted by Joshi, et al during the epidemic in 1997, right sided pleural effusion was the commonest finding, whereas gall bladder wall thickening was the most frequent finding in ours.¹⁰

*In our study there were no isolated left sided pleural effusion. Pleural effusion was either right sided or bilateral. This is in accordance with the findings of the studies conducted by Pramuljo and Harun SR which states that pleural effusion can be found on the right and in bilateral pleural spaces but no isolated left pleural effusion.*⁹

Bhamarapravati et al also found edema of the serosa of the gallbladder and ascites in the peritoneal cavity in patients with DF. The main pathophysiologic change in DF is an increased vascular permeability, causing plasma leakage and serous effusion with a high protein content (mostly albumin).¹¹

In studies conducted by Department of Child Health in Indonesia and by Joshi et al in Army Hospital, Delhi Cantt, they had also found abnormal liver parenchyma, which has been attributed to intraparenchymal and subcapsular haemorrhages.^{9,10} In our study however we could not appreciate any significant change in the echotexture of the liver.

None of these studies suggested GB wall thickening as the initial finding in DF (100%) as observed in our study, followed by pleural effusion.

These findings may also occur in other viral infections, enteric fever and leptospirosis, but in other viral infections the historical profile, symptom complex evolution and physical findings do not mimic those of DF. Ultrasound features of enteric fever include splenomegaly, intra-abdominal lymphadenopathy, bowel abnormalities in the form of intramural thickening of the terminal ileum and caecum, renal abnormalities like arteriectasis and perinephric fluid collection in addition to GB wall thickening and polyserositis. Leptospirosis also shows gross abnormalities involving hepatic and renal parenchyma. GB wall thickening also occurs in association with other conditions such as ascites, hypoalbuminaemia, congestive cholecystopathy and in patients with cirrhosis of liver and portal hypertension. It is a very non-specific finding when considered in isolation and is therefore a limitation of this study. Although not specific, the sonographic findings in DF are obtained more rapidly than the results of serologic tests.

Diagnosis can be made early in the course of disease compared with other modes of diagnosis. During an epidemic the ultrasound findings of GB wall thickening with or without polyserositis in a febrile patient should suggest the possibility of DF/DHF

CONCLUSION:

Abdominal ultrasound, being a non invasive, safe, low cost dynamic imaging tool, can be used as a first-line imaging modality in patients with suspected dengue fever to detect early signs suggestive of the disease prior to obtaining serologic confirmation test results, especially in a dengue fever epidemic and tropical areas. Although not specific, the sonographic findings in DF are obtained more rapidly than the results of serologic tests.

Early detection of dengue has a significant role in reduction of morbidity and mortality with better prognosis. Furthermore, diagnosis can be made early in the course of disease compared with other modes of investigation.

Hence during an epidemic of dengue, ultrasound findings of GB wall thickening with or without polyserositis in a febrile patient should suggest the possibility of DF/ DHF.

In an area experiencing a DF epidemic, when sonography shows a thickened gallbladder wall, ascites, splenomegaly, and pleural effusion, in a febrile patient with thrombocytopenia, DF should be considered in the differential diagnosis until it is disproven.

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16 Original article

COMPARATIVE STUDY OF HEART RATE VARIABILITY IN NORMOTENSIVE AND HYPERTENSIVE INDIVIDUALS

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ABSTRACT

Background - Hypertension is the most prevalent cardiovascular disorder that affects many organs of our body .Heart rate variability (HRV) is a simple, sensitive and non-invasive tool to monitor the cardiovascular function .The present study is for assessment of sympathovagal balance by analysing HRV in hypertensive individuals.

Objectives - To analyse Heart Rate Variability (HRV) in normotensive and hypertensive individuals.

Material and methods -30 hypertensive and 30 normotensive subjects between the age group of 30-60 years were selected. Lead-II ECG was recorded using instrument PHYSIOPAC-PP4, MEDICAID system, Chandigarh and HRV analysis was done using KUBIOS HRV analyser. Spectral indices of HRV based on frequency domain such as normalized low frequency power (LFnu), normalized high frequency power (HFnu), ratio of low frequency power to high frequency power (LF-HF ratio) and time domain such as standard deviation of normal-to-normal RR intervals (SDNN), root mean square successive difference (rMSSD) and the proportion of NN50 to the total number of NN intervals (pNN50) were assessed.

Results- Our results showed LFnu (78.17 ± 5.73) and LF-HF ratio(2.14 ± 0.24) was significantly increased in hypertensives and significant decrease was seen in HFnu (37.13 ± 3.70), SDNN (149.1 ± 4.82), rMSSD (36.4 ± 4.75) and pNN50 (9.97 ± 1.90) in hypertensives by student's paired t- test .

Conclusion-Above result suggests increased sympathetic and decreased parasympathetic activity. The pathophysiology of hypertension is primarily due to an increase systemic vascular resistance. This is attributed to enhanced sympathetic activity leading to sympathovagal imbalance.

Keywords- Hypertension (HTN), Heart Rate Variability (HRV), Time Domain Measures, Frequency Domain Measures.

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INTRODUCTION

Hypertension is the most prevalent non communicable disorder that affects many organs of the body including cardiovascular system [1].Hypertension represents a multifactorial disease of Blood Pressure (BP)regulation with persistently elevated systolic and/or diastolic BP over 140/90 mmHg. Hypertension is a risk factor for development of cardiovascular and cerebrovascular diseases (3).It has been estimated that hypertension accounts for 6%of death worldwide (2).

Blood Pressure (BP) is maintained physiologically by multiple regulatory mechanisms such as neural control, hormonal control and local control mechanism .Among them, neural control by autonomic nervous system (ANS) is the most important regulatory mechanism of blood pressure .Though hypertension is a multifactorial disease, ANS dysfunction is an important factor in the development and progression of hypertension (4).

ANS plays a fundamental role in the control of arterial blood pressure and heart rate and therefore, may be considered an important pathophysiological factor in the development of arterial hypertension (5). Measurements of HRV might assess progressive alterations in the sympatho-vagal balance observed in essential hypertension (6).

Heart rate variability (HRV) is defined as the oscillation of heart rate around the mean value .It is caused by variations in the input to the sinus node from the autonomic nervous system(7).It is simple ,sensitive and non-invasive tool to monitor the cardiovascular ANS function .It is a measure of balance between sympathetic mediators of heart rate and parasympathetic mediators of heart rate that is the influence of acetylcholine released by the parasympathetic nerve fibres acting on the sino-atrial and atrio-ventricular nodes leading to a decrease in the heart rate (8).HRV analysis thus can identify any change in sympathovagal balance .

This study is designed to assess the sympathovagal balance by analysing the HRV changes in hypertensive and normotensive subject.

AIMS AND OBJECTIVES

To analyse Heart Rate Variability (HRV) by Time domain measures and Frequency domain measures in normotensive and hypertensive individuals.

METHODS AND MATERIALS

This study was conducted in Department of Physiology, Grant Government Medical College and Sir JJ Group of hospitals, after obtaining clearance from the Institutional ethical committee. Study comprises of 60 individuals out of which, 30 were patients with primary hypertension between the ages of 30-60 years of both sexes, along with 30 ages and sex matched normotensive subjects as controls.

INCLUSION CRITERIA

- Criteria for considering hypertensive will be volunteers with blood pressure $\geq 140/90$ mm Hg based on average of three consecutive readings at an interval of 3 weeks will be recruited as hypertensive (group 2), according to JNC-7 classification (9).
- Normotensive - will be volunteers with BP values of 100-119/60-79 mm Hg will be recruited as normotensive (group 1), according to JNC-7 classification (9).

EXCLUSION CRITERIA

- Age less than 30 years and more than 60 years.
- Subjects with Diabetes Mellitus, Ischemic heart disease, peripheral arterial disease, strokes, renal failure, AIDS, TB, symptomatic coronary artery disease.
- Smokers and alcoholics.

Informed consent was obtained from all the subjects prior to the study. Recording was standardized and instructions followed as per the guidelines of Task Force of the European Society of Cardiology and the North American Society of Pacing and Electrophysiology (10). Subjects were advised to have their meal by 9:00 pm, to have a good sleep at night before and to remain free from any physical or mental stress, not to take sedatives or any drugs affecting central nervous system. They were also instructed to avoid tea or coffee at breakfast. All subjects were clinically examined and detailed history was taken with reference to duration of hypertension, family history, personal history like smoking, alcoholism etc and previous drug history. During this period subject was advised not to talk, eat or drink and also not to perform physical or any mental activity. Blood Pressure was recorded using mercury sphygmomanometer 10 minutes after taking rest. A standard adult size cuff measuring 23 cm by 12 cm was used for all subjects (11). A 5 min of ECG was done in supine position, in the morning time, using instrument PHYSIOPAC-PP4, MEDICAID SYSTEM, CHANDIGARH. The data analysis was done using the kubios HRV analyser. Following spectral indices of HRV will be assessed (12).

A. Time domain measures:

- Standard deviation of normal –to- normal RR intervals (SDNN).
- Root mean square successive difference (rMSSD).
- The proportion of NN50 to the total number of NN intervals (pNN50).

SDNN, rMSSD and pNN50 are measures of parasympathetic activity (12).

B. Frequency domain measures:

- Normalized low frequency power (LFnu).
- Normalized high frequency power (HFnu).
- Ratio of low frequency power to high frequency power (LF-HF ratio).

HFnu is a measure of parasympathetic activity and LFnu and LF/HF ratio are measures of sympathetic activity (12).

STATISTICAL ANALYSIS

The data analysis will be done using the Kubios HRV analyser. HRV measures were expressed as mean ± SD. Student paired “t- test “ and chi –square test was used for comparison the values between hypertensive and normotensive group p value< 0.05 was considered statistically significant .

Table 1 -Comparison of Time Domain Measures

Parameter	Hypertensive (n=30)	Normotensive (n=30)	t value	p value	Conclusion
	Mean ±s.d	Mean±s.d			
SDNN (ms)	149.1±4.82	157.73±4.92	6.863	P<0.0001	significant
rMSSD (ms)	36.4±4.75	45.77±3.08	9.066	P<0.0001	significant
pNN50	9.97±1.90	16.27±3.66	8.368	P<0.0001	Significant

Graph 1 – Comparison of Mean Time Domain Measures

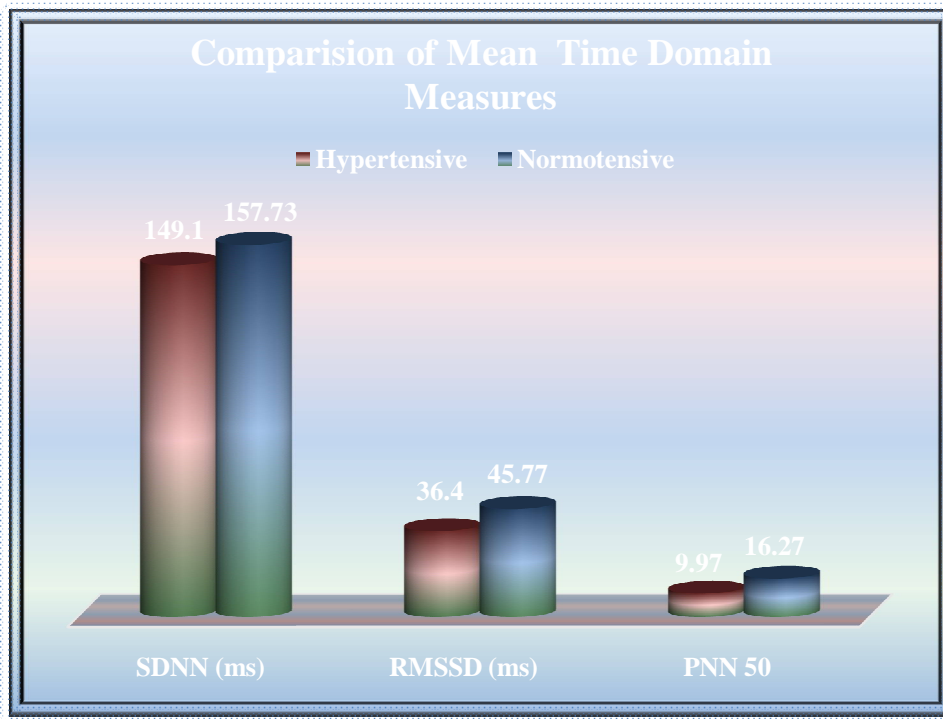
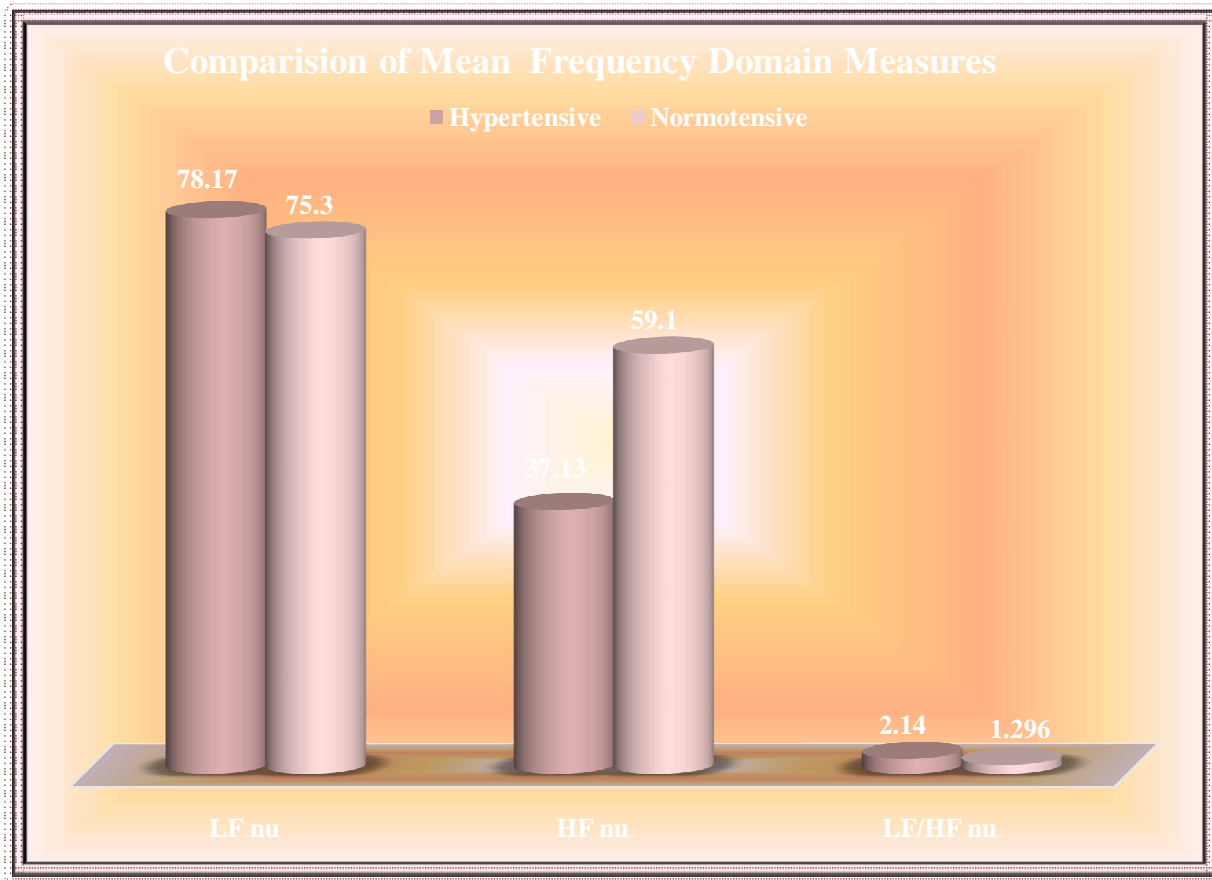


Table -2 Comparison of Frequency Domain Measures

Parameter	Hypertensive (n=30)	Normotensive (n=30)	t value	p value	conclusion
	Mean±s.d	Mean±s.d			
LF nu	78.17±5.73	75.3±4.46	2.165	0.0345	significant
HF nu	37.13±3.70	59.1±4.58	20.438	p<0.0001	Significant
LF/HF ratio	2.14±0.24	1.296±0.15	16.334	P<0.0001	significant

Graph -2 Comparisons of Mean Frequency Domain Measures.



DISCUSSION

In the present study LFnu and LF/HF ratio was significantly increased in hypertension but HFnu is decreased. Similarly, time domain measures – SDNN, rMSSD and pNN50 were significantly reduced in hypertensive. This shows that there is increased sympathetic activity and decreased parasympathetic activity in hypertensive.

A study shows that hypertensive subjects had markedly depressed HRV which reflects sympathovagal imbalance (3). Virtanen R et al. found that HRV is significantly lower in mild or moderate untreated hypertension (13). Another study revealed that adolescents with primary hypertension had lower HF and higher LF and LF/HF ratio suggesting sympathetic predominance and reduced vagal activity(7). Urooj et al showed that the time domain parameters such as SDNN, rMSSD and pNN50 were significantly reduced in hypertension compared to normal healthy subjects(14).Nirmala et al showed that there is increased sympathetic activity and decreased vagal tone associated with hypertension(2).

The results of our study were similar to the previous studies. Thus, our findings suggest that there is sympathovagal imbalance occurring in hypertensive.

Many pathophysiological factors have been implicated in the genesis of essential hypertension: increased sympathetic nervous system activity, perhaps related to heightened exposure or response to psychosocial stress; overproduction of sodium-retaining hormones and vasoconstrictors; long-term high sodium intake; inadequate dietary intake of potassium and calcium; increased or inappropriate renin secretion with resultant increased production of angiotensin II and aldosterone; deficiencies of vasodilators, such as prostacyclin, nitric oxide (NO), and the natriuretic peptides; alterations in expression of the kallikrein–kinin system that affect vascular tone .Increased activity of vascular growth factors ;alterations in adrenergic receptors that influence heart rate ,inotropic properties of the heart , and vascular tone ; and altered cellular ion transport .(15)

The pathophysiology of essential hypertension is primarily due to an increase in systemic vascular resistance. This is mainly attributed to the enhanced activity of sympathetic nervous system (2).

The sympathetic hyperactivity might be due to baroreceptor resetting that causes suppression of sympathetic inhibition. There is also evidence of norepinephrine spill over into the circulation in essential hypertension that leads onto sympathetic hyperactivity.

Experimental studies have shown increased Angiotensin II level in blood which can stimulate the secretion of catecholamines. (15) Angiotensin II also causes oxidative stress that leads onto interaction of reactive oxygen species (O⁻) with nitric oxide (NO) causing reduced levels of NO which results in vasoconstriction. (15)Local factors like endothelin might also be the contributing

factor for adrenergic activation characterizing hypertension. (16) This sympathetic hyperactivity eventually may lead onto sympathovagal imbalance in hypertensives.

CONCLUSION

From this study we concluded that there is an increased sympathetic activity and decreased parasympathetic activity in hypertensive individuals. Our study showed that HRV is significantly reduced in hypertensive patients compared to controls, indicating a decrease in the baroreceptor reflex. There is impairment in cardiac autonomic function characterized by sympathetic over activity and also showed sympatho-vagal balance in hypertensive patients is towards higher sympathetic and lower vagal modulation. Since reduced HRV is associated with cardiac arrhythmias, this suggests hypertensive patients may have risk for occurrence of cardiac arrhythmias in future. These simple noninvasive measures can be used for early detection and treatment of cardiac arrhythmias and other variations in cardiac autonomic function. Thus, it can be used as a routine screening test to predict future risk of hypertension and also for better prognosis during treatment.

FUTURE DIRECTIONS

- Since reduced HRV is associated with cardiac arrhythmias, this suggests hypertensive patients may have risk for occurrence of cardiac arrhythmias in future.
- These simple non-invasive measures can be used for early detection and treatment of cardiac arrhythmias and other variations in cardiac autonomic function.
- Thus, it can be used as a routine screening test to predict future risk of hypertension and also for better prognosis during treatment.

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17 Original article:**EFFECT OF TRANSDERMAL NITROGLYCERIN PATCH ON INTRATHECAL NEOSTIGMINE WITH BUPIVACAINE FOR POST OPERATIVE ANALGESIA**

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ABSTRACT:

Background: Spinal anesthesia is preferred over general anesthesia for various surgeries as it is simple to perform and economical. And produces rapid onset of anesthesia, analgesia with good muscle relaxation. Concept of post operative analgesia is gaining importance. Intrathecal neostigmine causes dose dependent post operative analgesia by inhibiting breakdown of acetylcholine in dorsal horn and spinal meninges. Acetylcholine produces analgesia indirectly through stimulation of release of nitric oxide in spinal cord. The transdermal nitroglycerine patch has been related to nitric oxide formation during degradation of organic nitrate and enhances the antinociception produced by low dose neostigmine intrathecally

Objective: to evaluate efficacy and potency of intrathecally administered bupivacaine with neostigmine (source of Acetylcholine) and bupivacaine and neostigmine with nitroglycerine patch (source of exogenous NO) on onset and duration of sensory and motor blockade, hemodynamic stability, duration of post operative analgesia and side effects in various surgeries.

Material &method: The study was conducted by taking 50 randomly selected patients for various surgeries. Patients belonged to ASA Grade I/II aged 18 to 60 years after excluding them according to exclusion criteria. Patient were divided into 2 groups.

Group-A : 0.5% heavy bupivacaine 3 ml (15 mg) + preservative free neostigmine 5 mcg.

Group-B : 0.5% heavy bupivacaine 3 ml (15 mg) + preservative free neostigmine 5 mcg + transdermal nitroglycerine patch (5 mg/24 hours), applied on a non anaesthetized area after 20 minutes.

Results: There was no statistically significant difference present regarding time of onset of sensory as well as motor blockade and hemodynamic parameters. There was highly significant

difference between total duration of analgesia in both groups($p < 0.01$) which was more in group B as compared to group A. Event of more hypotention noted in group B than group A and incidence of bradycardia was same in both groups.

Conclusion: From this study it can be concluded that transdermal nitroglycerine patch increases post-operative analgesia of low dose intrathecal neostigmine with bupivacaine in spinal anesthesia with less side effects.

Key words: spinal anaesthesia, neostigmine, nitroglycerine patch, post-operative analgesia

INTRODUCTION

The international association for the study of pain has defined pain as “An unpleasant and emotional experience associated with actual or potential tissue damage or described in terms of such damage”⁶.

Spinal anesthesia is preferred over general anesthesia for various surgeries. All advantages of spinal anesthesia are offset by complain of postoperative pain when effect of local anesthesia wears off due to relatively shorter duration of action of local anesthetic drug. Concept of post operative analgesia is gaining importance.

Intrathecal neostigmine causes dose dependent post operative analgesia by inhibiting breakdown of acetylcholine in dorsal horn and spinal meninges. Acetylcholine causes analgesia through direct action on spinal cholinergic muscarinic receptors m1 and m3 and indirectly through stimulation of release of NO. Our objective was to evaluate efficacy and potency between two groups on onset and duration of sensory and motor blockade, hemodynamic stability, duration of post operative analgesia and side effects in various surgeries. The transdermal nitroglycerine patch has been related to nitric oxide formation during degradation of organic nitrate and enhances the antinociception produced by low dose neostigmine intrathecally.

MATERIAL AND METHOD

The study was conducted by taking 50 randomly selected patients for various surgeries. Patients belonged to ASA Grade I/II aged 18 to 60 years.

Exclusion criteria:

- Allergic to study medications.

- History of significant neurological, psychiatric, neuromuscular, cardiovascular, pulmonary, renal or hepatic disease.
- Alcohol or drug abuser
- Patient refused to give consent for this study.

Patient were divided into 2 groups.

Group-A : 0.5% heavy bupivacaine 3 ml (15 mg) + preservative free neostigmine 5 mcg.

Group-B : 0.5% heavy bupivacaine 3 ml (15 mg) + preservative free neostigmine 5 mcg + transdermal nitroglycerine patch (5 mg/24 hours), applied on a non anaesthetised area after 20 minutes.

Detailed pre anaesthetic check up with all routine investigations were done in pre operative room before surgery. Informed consent was taken and VAS scale explained to patient.

Inside the operation theatre intravenous line taken and each patient was preloaded with 10 ml/kg of ringer's lactate solution. Pulse oximeter, non invasive blood pressure and ECG monitors were applied and baseline readings were taken.

Inj. neostigmine 0.5 mg was diluted in 10 cc with normal saline and 1 cc is taken from it and again diluted in 10 cc and from it 1 cc (5mcg) was taken with 3cc(15 mg) of 0.5% hyperbaric bupivacaine. Total volume of 4ml was used. Under all aseptic and antiseptic precaution spinal anesthesia was performed in sitting/lateral position at L₂L₃ or L₃L₄ intervertebral space with 23G quincke spinal needle. After completion of procedure patients were immediately turned to supine position and time to subarachnoid injection was noted . Highest T6-T8 level achieved. O₂ was given by Hudson mask at the rate of 4 L/min by the anaesthesia machine. In group B after haemodynamic stabilisation the transdermal nitroglycerin patch was applied on the thorax (ventral, T2-T4), in a non-anaesthetised area, 20 minutes after spinal puncture. The total nitroglycerin content of transdermal nitroglycerine patch was 25 mg; the total drug releasing area was 10 cm². It delivered nitroglycerine at the rate of 20-25 µg/cm².h or 5mg /24 hours.

Evaluation :

SENSORY BLOCK: was checked by using pin prick method with the tip of 24 G hypodermic needle

- Time of onset of sensory blockade in minutes.

- Time of two segment regression of sensory block in minutes.

MOTOR BLOCK: was assessed by modified Bromage scale.(0=none, 1=just able to move the knee but not the hip, 2=able to move foot only,3=unable to move knee or foot)

- Complete motor blockade: (it was defined as the time from intrathecal drug injection to time to attain modified Bromage grade 3)
- Duration of motor block: ((it was defined as time interval from intrathecal drug injection to when modified Bromage scale grade become 0 again)

(3) INTRA OPERATIVE VITAL PARAMETERS:

Pulse rate, Blood pressure and SPO2 were monitored at every 5 mins till first 30 minutes then every 10 min till 1 hr and then every 30 min till the end of surgery.

(4) INTRA OPERATIVE COMPLICATIONS:

Intraoperative complications like hypotension, respiratory depression, nausea, vomiting, shivering were treated as follow:

Hypotension greater than 15% below the baseline value was treated by the incremental dose of Injection mephenteramine 6 mg IV.. Any fall in the heart rate below 60 beats per minute was treated with incremental doses of Inj. atropine 0.3 mg IV. Intraoperative nausea was treated with Inj. Ondansetron 4 mg intravenous. shivering was treated with 100% oxygen, warm fluids and adequate covering. No other sedation or analgesic drug given to the patients .

(5) POST OPERATIVE PERIOD:

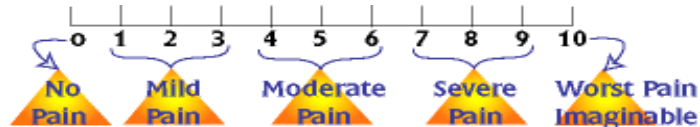
Time from subarchnoid injection to administration of first rescue analgesic was taken as total duration of analgesia.

Method of judging postoperative analgesia by VAS(Visual Analogue Scale). At this time, patients were given rescue analgesic Inj Diclofenac Sodium 1.5mg/kg IM. Vital parameters were recorded initially at 30 min interval for 1 hr then hourly for 7 hr then 2 hrly for 4 hrs (total 14 hrs).

PAIN ASSESSMENT:

It was done every 30 mins for initial 1 hr then hourly for 7 hr and then 2 hourly for 4 hr by using Visual Analogue Scale (VAS).

It is a 10 cm scale graded from 0-10 in such a way that 0 denotes no pain and 10 denote most excruciating pain. Patients were asked to mark the point on the scale that corresponded to their level of pain intensity at the time of observation.



Transdermal Nitroglycerine patch was removed after giving the rescue analgesia.

(6) POST OPERATIVE VITAL PARAMETERS:

Vital parameters were recorded initially at 30 min interval for 1 hr then hourly for 7 hr then 2 hrly for 4 hrs (total 14 hrs).

(7) POST OPERATIVE COMPLICATIONS

Postoperative complications like bradycardia , hypotension ,respiratory depression, nausea, vomiting, shivering, post dural puncture headache, backache were observed and treated accordingly.

The results of the study were tabulated & statistically compared among the two groups. The **Student t test** was used for quantitative data. Data were presented as mean and mean+SD.

The **p-value** was considered significant if it was <0.05.

OBSERVATION AND RESULTS

There were 25 patients in each group and their demographic characteristics are shown in following table.

Table 1 : Demographic Profile Of Groups With Mean And S.D Values

	Group A	Group B
Numbers of patients	25	25
ASA grade (I/II)	15/10	15/10
Age(Yrs)	37.24±12.3	37.64±11.82
Weight(kg)	55.12±3.59	55.60±4.04

Table 1 shows there was no statistically significant ($P>0.05$) difference among two groups in terms of demographic data like Age, Weight and ASA grade .

Table 2 Characteristics Of Sensory Block

	Group A	Group B
Time to achieve sensory block (Mean ± SD) minutes	3.12± 0.60	3.52 ± 0.96
Duration of two segment regression of sensory block (Mean ± SD) minutes	137.36± 3.45	139.72± 3.57

Table 2 shows there was not significant difference in two groups with regards to duration of two segment regression of sensory block.

Table-3 Characteristics of Motor Blockade

	Group A	Group B
Time to achieve Grade 3 block (Mean ± SD) minutes	5.48± 0.87	5.52 ± 0.87
Time taken for Grade 3 to Grade 0 level (Mean ± SD)minutes	201.52 ± 7.41	200.16 ± 10.19

Table 3 shows there was not significant difference in two groups with regards to time to achieve grade 3 block and duration of grade 3 to grade 0 level($p>0.05$).

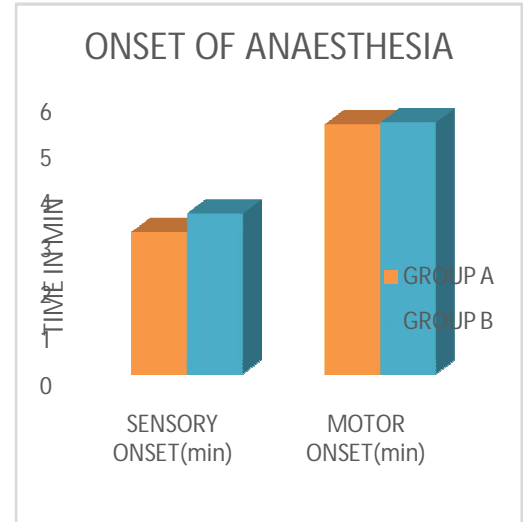
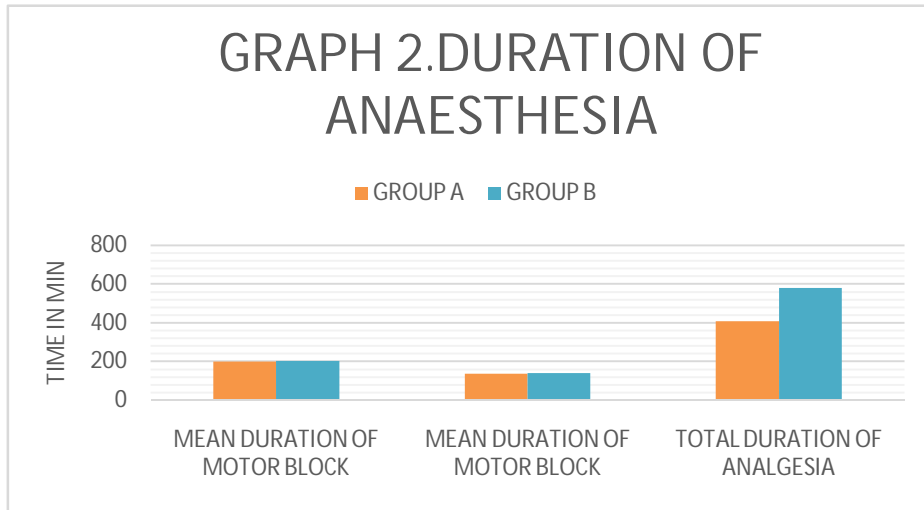


Table-4 Intraoperative Hemodynamic Monitoring (mean)

Time	Group-A			Group-B		
	Pulse (Per min)	Blood pressure (mm of Hg)		Pulse (Per min)	Blood pressure (mm of Hg)	
		Systolic	Diastolic		Systolic	Diastolic
5 min	83.88	124.88	77.92	85.0	125.92	78.96
10 min	81.92	121.36	77.60	82.04	121.28	77.52
15 min	80.40	114.32	72.16	80.36	113.84	72.24
20 min	77.28	108.72	67.68	76.52	108.64	67.72
25 min	73.88	106.48	64.88	75.12	105.92	65.44
30 min	71.08	107.12	66.64	74.36	101.68	62.56
40 min	73.08	109.2	68.88	73.08	106.08	67.92

50 min	72.08	110.16	71.2	72.08	110.16	71.2
60 min	72.72	112.48	73.04	72.72	112.24	72.24
90 min	73.84	116.56	72	73.84	116.32	71.52
120 min	77.76	118.64	75.28	77.76	118.64	75.28

Table 4 shows that there was statistically insignificant difference between two groups with regards to hemodynamic parameters.

Table-5 Postoperative Hemodynamic Monitoring

Time	Group-A			Group-B		
	Pulse (Per min)	Blood pressure (mm of Hg)		Pulse (Per min)	Blood pressure (mm of Hg)	
		Systolic	Diastolic		Systolic	Diastolic
150 min	73.84	116.56	72	77.4	120.08	75.92
180 min	77.76	118.64	75.28	78.72	119.84	76.4
240 min	77.4	120.08	75.92	80.68	120.96	75.6
300 min	81.84	122.08	78.08	81.68	121.76	77.84
360 min	82.88	122.8	77.68	82.84	122.48	77.44

420 min	84.16	123.12	77.92	84.2	122.88	77.84
480 min	84.92	123.44	77.92	84.96	123.6	78.08
540 min	83.12	125.52	78.4	82.96	125.28	78.48
600 min	82.68	126.88	80.8	82.52	126.64	80.48
720 min	83.92	124.88	82.0	83.6	124.72	81.6
840 min	84.56	124.64	83.12	84.32	124.48	82.64

Table 5 shows that there was statistically insignificant difference between two groups with regards to hemodynamic parameters.

Table-6 Total duration of analgesia

Time in Minutes	No. of Patients	
	Group A	Group B
300-350	2	0
351-400	6	0
401-450	17	0
451-500	0	0
501-550	0	5
551-600	0	13
601-650	0	7
Mean time \pm S.D.	408 \pm 30.27	580.8 \pm 34.87

Table 6 shows highly significant difference between total duration of analgesia

in both groups($p<0.01$).

Table-7 Peri Operative Complications

Complications	No. of Patients			
	Group-A		Group-B	
	Intra-Op.	Post-Op.	Intra-Op.	Post-Op.
Nausea / Vomiting	0	0	0	0
Hypotension	5(20%)	0	9(36%)	0
Bradycardia	5(20%)	0	5(20%)	0
Respiratory depression	0	0	0	0
Shivering	0	0	0	0

Table 7 shows that more hypotension noted in group B than group A and incidence of bradycardia was same in both groups.

DISCUSSION

Effective control of post operative pain remains one of the most important and pressing issues in the field of surgery and anesthesia with significant impact on our health care system.

The aim of this study was to evaluate that nitroglycerine patch (source of exogenous NO) would enhance the analgesic efficacy of intrathecal neostigmine (source of acetylcholine) with bupivacaine.

The study was conducted by taking 50 randomly selected patients for various surgeries. Patients were divided into 2 groups.

Group-A : 0.5% heavy bupivacaine 3 ml (15 mg) + neostigmine 5 mcg.

Group-B : 0.5% heavy bupivacaine 3 ml (15 mg) + neostigmine 5 mcg + transdermal nitroglycerine patch (5 mg/24 hours).

Naguib M et al⁵ in 1997 studied increased level of acetyl choline binds to muscarinic and nicotinic receptors in the spinal cord dorsal horn and neostigmine increase level of acetylcholine in cerebrospinal fluid and acetylcholine bioavailability at cholinergic nerves within the spinal cord. Acetylcholine causes analgesia through direct action on spinal cholinergic muscarinic receptors M1, M3 and indirectly through the second messenger Nitric Oxide in spinal cord.

- The objective of our study was to observe effect of transdermal nitroglycerine patch on the efficacy of low dose of intrathecal neostigmine with bupivacaine.

Characteristics Of Sensory Blockade:

- **Ahmed et al¹ in 2010** studied that onset of sensory block was faster in neostigmine using groups. There was no statistically significant difference was present regarding duration of regression time of sensory block by two segments.
- In our study there was no statistically significant difference present regarding time of onset of sensory blockade as it was 3.12 ± 0.60 min in Group A and 3.52 ± 0.96 min in Group B ($P > 0.05$). There was no statistically significant difference present regarding time of two segment regression of sensory block as it was 136 ± 35.08 min in Group A and 139.72 ± 3.57 min in Group B ($P > 0.05$).

Characteristic Of Motor Blockade :

- **Ahmed et al¹ in 2010** studied that there was no significant difference between onset and duration of motor block in neostigmine using group as compared to other groups.
- In our study we did not find any significant difference between two groups regarding time to achieve complete motor blockade as it was 5.48 ± 0.87 min in Group A and 5.52 ± 0.87 min in Group B ($P > 0.05$). we did not find any significant

difference between two groups regarding duration of motor block as it was 200 ± 6.75 min in Group A and 201 ± 6.84 min in Group B ($P > 0.05$).

Hemodynamics Monitoring :

Gabriela et al³ in (2000) observed no bradycardia and hypotension in their study.

- In our study we observed bradycardia in both groups in intraoperative period. There was significant fall in blood pressure noted after 25 min in Group B ($106.32 \pm 4.44, 65.68 \pm 4.02$ mins) as compare to Group A ($107.52 \pm 4.87, 64.8 \pm 5.22$ mins) patients. Thereafter blood pressure was comparable in both the groups. There was no significant difference between two groups regarding postoperative hemodynamic monitoring in both groups upto 12 hrs.

Total Duration Of Analgesia :

- **Anand et al² in 2008** studied that duration of analgesia was longer in intrathecal neostigmine (50 mcg) group (322.2 ± 25.76 min) as compare to bupivacaine (15 mg) group (185.8 ± 10.90 min).
- In our study there was significant difference between total duration of analgesia as it was longer duration in Group B (580 ± 34.87 mins) as compare to Group A (408 ± 30.27 mins) ($P < 0.05$).

Peri operative Complications :

- In our study incidences of hypotension were more in Group B (36%) as compare to Group A (20%).
- In our study 5 patients in each group had bradycardia.
- Any other complications like nausea, vomiting, respiratory depression and shivering were not present in both the groups.

CONCLUSION

In our study of 50 patients we observed that intrathecal neostigmine 5 mcg with bupivacaine 15 mg with transdermal nitroglycerine patch (5 mg/day) markedly prolong duration of post operative analgesia than intrathecal neostigmine with bupivacaine alone. Intraoperative complication like bradycardia do occur but it



was not significant, and other complication like hypotension occur with both groups but more in group B which requires monitoring .

So from this study it can be concluded that transdermal nitroglycerine patch increases post operative analgesia of low dose intrathecal neostigmine with bupivacaine in spinal anesthesia with less side effects.

CONFLICT OF INTEREST:None

SOURCE OF SUPPORT:Nil

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18 Original article

SURGICAL MANAGEMENT OF PAEDIATRIC EMPYEMA

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ABSTRACT

Introduction: Empyema thoracis is defined as a collection of suppurative fluid in the pleural space. Pleural space infections arise secondary to a subjacent pneumonia or may complicate thoracic injury. In the paediatric population, parapneumonic effusion is the most frequent aetiology. [1]

Aims and Objectives: We undertook a study of all patients admitted between 2014 to 2016 with empyema thoracis who required surgical intervention in the form of intercostal drainage tube insertion, thoracotomy, thoracoscopy or a combination thereof.

Materials and Methods: We did a retrospective study of 290 patients in VS General Hospital, patients ranging from infancy to 14 years who presented with empyema thoracis.

Conclusions: Video assisted thoracoscopic surgery is the preferred modality for the management of paediatric empyema if they present in the early stage as it is minimally invasive. More complicated empyemas or those that present in the later stages might need thoracotomy with decortication.

INTRODUCTION

The diagnosis and treatment of bacterial empyema are best understood in relation to the altered anatomy and pathological physiology of the pleura and the associated host defence dysfunctions.

Streptococcus pneumoniae used to be the most common organism causing parapneumonic effusions in the pre-penicillin era[6]. However, in the late 1950s Staphylococcus aureus became the main organism producing childhood empyema. Both traumatic and iatrogenic injury to adjacent structures may lead to secondary infection and involvement of the pleura. Similarly, retropharyngeal, retroperitoneal and vertebral or paravertebral infections can also extend to the pleura.

The formation of empyema has been divided into three phases- the exudative phase during which pus accumulates; a fibro purulent phase during which fibrin deposition and loculation of pleural exudate occurs; and an organisation phase during which fibroblast proliferation and scar

formation cause lung entrapment. Prompt diagnosis and intervention should circumvent the second and the third phases of empyema formation. To achieve this goal, physicians need to appreciate the subtleties of clinical expression of pleural empyema and the adverse effects of the suppurative environment on antimicrobial efficacy and tissue injury in the pleural space.

Currently patients of empyema are treated with antibiotics, percutaneous aspirations under USG guidance, intercostal drain tube placement, open thoracotomy, or a video-assisted thoracoscopic surgery, or a combination thereof. The treatment is individualised according to the way the patient presents and the extent and stage of empyema.

MATERIAL AND METHODS

The present study of 'Surgical management of paediatric empyemas' was carried out in the Department of Paediatric Surgery in V.S. General Hospital, a tertiary care centre. We studied 290 cases of empyema thoracis admitted for a duration of six years from the year 2011 to 2016, the age group extending from infancy to 14 years.

While assessing the patients, a detailed history was taken and signs and symptoms of empyema were noted. Most of the patients were referred from PHCs, CHCs and district hospitals and by paediatricians. Most of them had been treated by oral and often an inadequate antibiotic course. The most common presentation consisted of fever, cold, cough and respiratory distress. However, fever persisted with gradual development of respiratory distress. At this stage, an X-ray of the chest and ultrasound were done which were suggestive of pleural effusion, hydropneumothorax or empyema. Treatment in all cases of empyema was started as soon as diagnosis was confirmed by investigations. Primary treatment was supportive including oxygen through mask/hood or by nasal catheter. In the event of respiratory distress, ICD insertion was done, followed by thoracoscopy or open thoracotomy at a later stage. If there was no respiratory distress and a short clinical history of less than 15 days, a primary thoracoscopy was done. Initial antibiotic regime consisted of amoxicillin +clavulanic acid and amikacin, awaiting the culture and sensitivity.

RESULTS

Pleural fluid culture showed growth in only 90 out of 290 patients as most of our patients had received some form of antibiotic therapy before presenting to us.

Organism	Pleural Fluid Culture
Staphylococcus aureus	50
Pseudomonas	26
Streptococcus pneumoniae	4
Klebsiella	8
Escherichia coli	2

The most commonly identified organism is Staph aureus, followed by Pseudomonas.

The stage of the disease was decided by the consistency of pus, chest X-ray, thoracotomy/thoracoscopy findings. The stage of empyema most commonly seen in this study

of 290 patients was Stage 2 (fibrinopurulent) consisting of 200 patients, followed by Stage 1 (exudates) with 50 patients and lastly stage 3 (organised) with 40 patients.

Stage of Disease	Number of Patients
Stage I	50
Stage II	200
Stage III	40

The type of treatment given in our study was as follows-

1	antibiotics with/without aspiration	6
2	ICD only+ antibiotics	44
3	ICD followed by VATS	30
4	Primary VATS	170
5	Thoracotomy	40
	➤ Followed by ICD	10
	➤ Followed by VATS	30

The average number of days of intercostal tube drainage required in conservative vs operative management was as following-

Antibiotics with/without aspiration	13
ICD only with Antibiotics	17
ICD followed by VATS	25
Primary VATS	20
Thoracotomy	25

The average length of hospital stay in our study was-

Antibiotics with/without aspiration	25
ICD only with Antibiotics	19
ICD followed by VATS	32
Primary VATS	24
Thoracotomy	27

DISCUSSION

In the pre-antibiotic era, empyema was a complication seen in 10% of patients who survived bacterial pneumonia[5]. The optimal management of children with empyema can be controversial[9,10]. While many patients can be treated with antibiotics or closed tube drainage, the success of this treatment depends on the character of pleural exudates. A good intercostal drain care culminates into early and complete expansion of lung, complete evacuation of pus from pleural cavity and reduction of hospital stay.

Thoracoscopy is an ideal minimal invasive procedure which when used early to treat children with acute and fibrinopurulent empyema allows for visualization of the entire pleural cavity and debridement and irrigation of all inflammatory debris. It does not prohibit subsequent surgical intervention or decortication, should these additional procedures become necessary.

In our series, we offer tube thoracostomy as an emergency procedure, followed by VATS decortication whenever indicated. Open decortication was reserved for grade III empyema patients.

Ruptured liver abscess maybe a cause of empyema. In our study 10 patients of ruptured liver abscess presented with empyema and got managed with intercostal drainage and antibiotics. Simultaneously with drainage of liver abscess, 3 of these patients were taken up for VATS decortication.

Multiloculation of the pleural space is the most significant cause of drainage failure[4].

Although VATS does not accomplish as thorough a pleural cleansing as thoracotomy with decortication, it is often successful because the bacterial load and inflammatory exudates are reduced below a critical level allowing the pleural space to recover. It has the advantages of limiting morbidity to skin, muscles, nerves and supporting structures which occur following a large surgical incision.

Lawrence DR in their study concluded that primary surgical therapy with VATS should be considered for all patients with pleural empyema irrespective off the duration of symptoms[7].

Mackinlay et al reported 31 patients in fibrinopurulent phase treated with VATS and compared this group with 33 patients treated by formal thoracotomy[8]. They stated that VATS treatment had the same success rate as open thoracotomy but offered substantial advantages over thoracotomy in terms of resolution of the disease, hospital stay , and cosmesis.

Cassina PC in their study concluded that VATS represent a suitable treatment for fibrinopurulent empyema when chest tube drainage and fibrinolytic agent have failed to achieve the proper results, while in a latest organising phase, full thoracotomy with decortication remained treatment of choice[3]. This was substantiated by the results of our series, where 15 patients presented in later phase had to undergo thoracotomy.

In a study of 10 patients of empyema, Shah et al concluded that, thoracoscopy has come as a new ray of hope for the patients with empyema, with the advantages of complete evacuation, minimal pulmonary dysfunction, reduced pain and hospital stay[2]. All the patients recovered well with an early removal of intercostals tube and reduced post-operative hospital stay and showed complete resolution of empyema on follow up.

CONCLUSION

Thoracic empyema in the paediatric population is usually a complication of bacterial pneumonic process with several treatment options. In its early stage, it is treated by tube thoracostomy for drainage as an adjunct to appropriate antibiotic therapy directed at causative organisms. Thorough chest physiotherapy is mandatory for management of empyema.

The VATS technique for thoracic empyema is a well-tolerated, minimally invasive technique, with good therapeutic results, mild post-operative complications and reduced hospitalisation. VATS should be considered as a treatment of choice for thoracic empyema in the fibrinopurulent stage as it is more effective when applied primarily.

To achieve a high success rate with VATS, early referral of the patient is required.

Conversion thoracotomy should be liberally used in case of chronicity especially after long history. When organised pus has developed, open surgery should be undertaken and complete decortication done.

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19 Original article**EFFECT OF SHORT TERM YOGA TRAINING ON CARDIO-VASCULAR PARAMETERS**

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Abstract**Background and objective:**

Yoga-originally viewed as a life style, is now recognized as a therapy with tremendous applicability in presentation and promotion of physical, mental, emotional ,intellectual and spiritual health.

Regular practice of yoga integrates the mind and body. It produces many systemic psycho-physical effects in the body, in addition to its specific effects on cardiovascular system.

The aim of the present study was to assess the beneficial effects of yoga in the improvement in the cardiovascular functions of young healthy adults.

Methods: The study group consisted of 30 young adults (19 males and 11 females) who were students of first year MBBS, Medical college, Baroda.

They were motivated to participate in yoga workshop for one hour daily for four weeks. The first phase of recording of cardiac parameters was done at beginning of their course. The second phase of recording of cardiac parameters was done after 4 weeks of regular yoga practice. The data was analysed using students paired't' test.

Results:

Participants had a mean age of 17.81 ± 0.48 years, height of 164.21 ± 5.09 cms., weight of 54.34 ± 5.63 kgs.

The pulse rate before yoga practice showed a mean value of 88.94 ± 7.58 and after, it showed a mean value of 78.87 ± 5.18

The systolic blood pressure (mmHg) - before yoga practice showed a mean value of 117.27 ± 10.78 , after yoga practice showed a value of 108.60 ± 8.64

The diastolic blood pressure (mmHg) - before yoga practice showed a mean value of 81.13 ± 9.03 , after yoga practice showed a mean value of 74.73 ± 6.56

Pulse pressure (mmHg) -before yoga practice showed a mean value of 35.80 ± 8.60 , after yoga practice showed a mean value of 33.87 ± 5.86

For pulse rate, systolic blood pressure, diastolic blood pressure - a p value of <0.001 was considered as a highly significant while Pulse pressure was not statistically significant.

Conclusion: There was a statistically significant decrease in all the above cardiovascular parameters in the regular yoga practice. This study proposes that regular practice of yoga can improve health related aspects of physical fitness and general well being.

Key words- yoga , cardiacvascular parameters (PR, SBP, DBP, PP)

Introduction

Yoga is the best life style modification which aims to attain the unity of mind ,body &spirit through asanas (exercise) , pranayama (breathing)& meditation.*1

Exercises in different forms , if performed regularly , have a beneficial effect on various systems of the body. Breath is a dynamic bridge between body& mind , pranayam is the art of prolongation& control of breath, helps in bringing conscious awareness to breathing & the reshaping of breathing habits & patterns*2

practice of yoga appears to be helpful in decreasing subjective feelings of anxiety , improving physical fitness and providing mental relaxation. It can lower Blood pressure , Heart rates and has been found helpful in patient with cardiac diseases. It tries to balance the sympathetic and parasympathetic activities of autonomic nervous system. Four weeks of nadisudhhi pranayama has shown significant decrease in pulse rate, systolic& diastolic blood pressure, along with significant increase in pulse pressure.*3

During OM meditation there was a significant reduction in heart rate as compared to control period in which non targeted thinking was encouraged.*4,5

The aim of present study was therefore, to assess to beneficial effects of yoga in the improvement and strengthening of cardiac functions. In this study we tested the hypothesis that a 4 week yoga training program improves cardiac functions in healthy young adult subjects.

subjects and methods

The present study was carried out in the department of physiology in medical college Baroda.

A group of 30 medical students of first year M.B.B.S. was randomly selected since age, height, weight affect cardiac function tests, following criteria were used for selection of subjects

Inclusion criteria

- Subject were from the age group of 17 to 19 years

- The height of all subjects was ranged from 150 to 175 centimetres
- The weight of all subject ranged 40 to 65 kilograms

Exclusion criteria

- Students who are doing yoga regularly
- students not coming for regular yoga training
- The students who were having history of any other major illness e.g. hypertension, diabetes mellitus, heart disease etc.
- Chest deformities like kyphosis , scoliosis.

Systemic disease and cardiac disorders were ruled out in the selected subjects by taking their detailed history and by their clinical examination

Depending on the inclusion/exclusion criteria , the number of subjects finally taken is 30. Out of 30 students 19 were males and 11 were females. The subject were explained the purpose and importance of the study. They were motivated to participate in the present work only prior consent was taken for participation in research and yoga workshop

Cardiac parameters was taken prior to yoga workshop and data collection for the same parameters was taken after one month of yoga practice.

Pulse rate per minute (PR)

Systolic blood pressure in mmHg (SBP)

Diastolic blood pressure in mmHg (DBP)

Pulse pressure in mmHg (PP)

All the above test were done at the same time of the day i.e between 7 to 8 a.m. to avoid diurnal variation. The result of cardiac function tests before and after yoga therapy were compared and statistically analysed using students T - test.

Subjects used to perform yogasana for one hour (7 to 8 a.m.) a day. The yogic curriculum included prayers followed by chanting 'om', pranayama, meditation and different asanas i.e. different physical postures. The asanas performed at the yoga workshop were as follows

- sukhasana
- padmasana
- chakrasana
- shavasana
- makarasana
- bhujangasana`

Methods

All the parameters were taken with the subjects in sitting position. . The tests were done in quite room in order to eliminate emotional and psychological stresses

Pulse Rate (PR) - The pulse rate was recorded for 1 minute by palpating the right radial artery of the subject at wrist by applying there middle fingers of the right hand.

Blood pressure (SBP,DBP,PP) - Blood pressure was recorded over right brachial artery at the level of cubital fossa by using sphygmomanometer. The systolic and diastolic blood pressure were recorded by auscultatory method. Pulse pressure was calculated as difference between systolic and diastolic blood pressure.

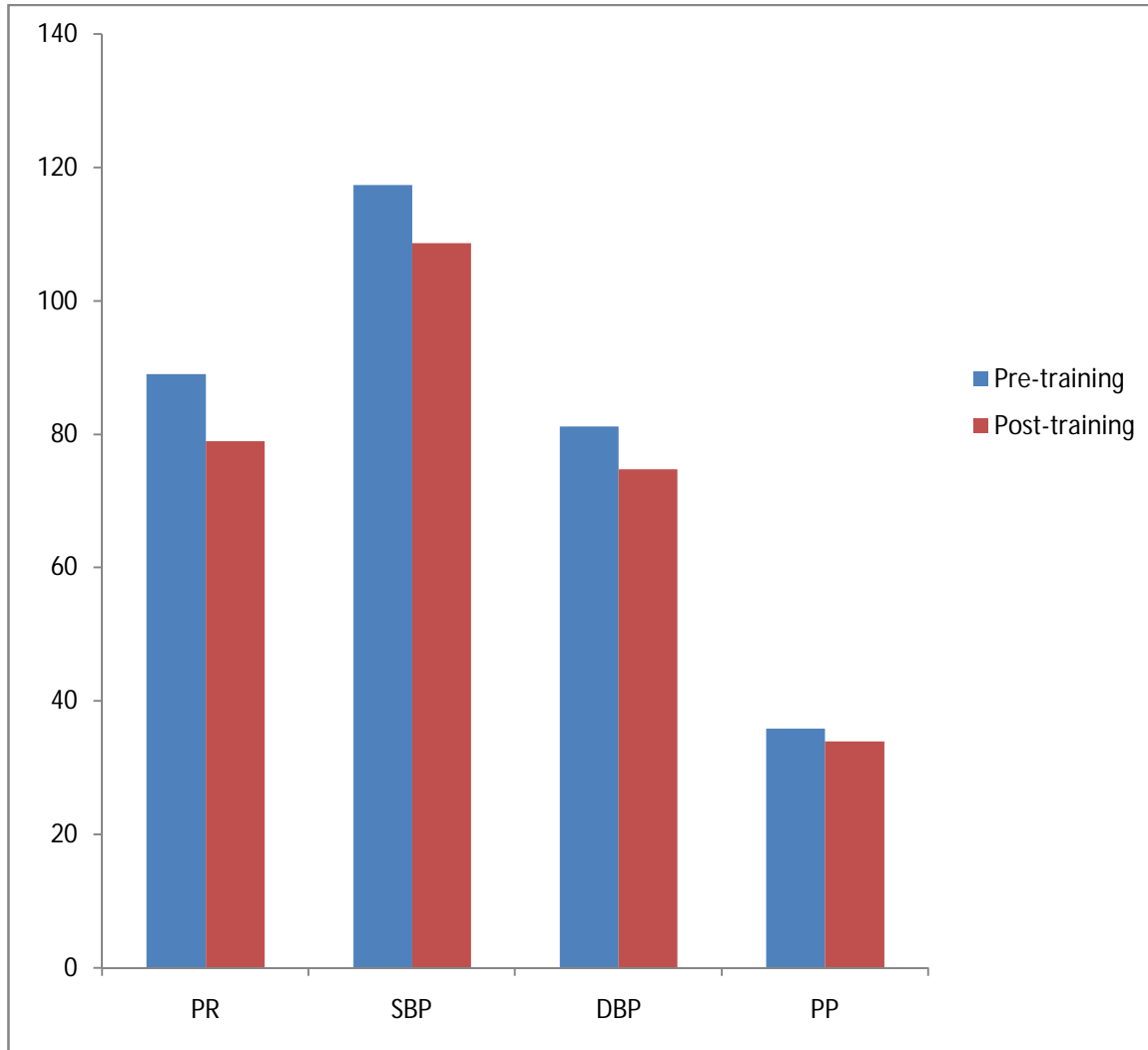
RESULTS

Parameters	Male (n = 19)	Female (n = 11)	Total (N = 30)
Age (Years)	17.89 (17-19) ±0.46	17.64 (17-18) ±0.50	17.81 (17-19) ±0.48
Height (Cms.)	166.95 (159-174) ±3.60	159.45 (152-164) ±3.59	164.21 (152-174) ±5.09
Weight (Kg.)	57.34 (49-64) ±4.25	49.14 (42.5-54) ±3.56	54.34 (42.5-64) ±5.63

Table 2 showing mean and SD values of cardiovascular parameters before and after Yoga training (N=30)

Parameters	Before training	After training
Pulse rate (per min)	88.94 ±7.58	78.87 ±5.18
Systolic blood pressure (mmHg)	117.27 ±10.78	108.60 ±8.64
Diastolic blood pressure (mmHg)	81.13 ±9.03	74.73 ±6.50
Pulse pressure (mmHg)	35.80 ±8.60	33.87 ±5.86

Histogram showing changes in PR, SBP, DBP, AND PP after yoga training (N=30)



PR = Pulse rate per min. , SBP = Sysolic Blood pressure in mmHg, DBP = diastolic blood pressure in mmHg and PP = Pulse pressure in mmHg

Thirty healthy volunteers medical students were subjects for the present study. Of these 19 were males and 11 were females.

Their age range between 17 and 19 years (mean value = 17.81) , height between 152 and 174 cms (mean value = 164.21) and weight between 42.5 and 64 Kg (mean value = 54.34). These are shown in Table 1.

Each subject acted as his own control. Comparing cardio-vascular parameters before and after yoga training (Table 2) it can be seen that there is highly significant reduction in heart rate (from mean value of 88.94 ± 7.58 to 78.87 ± 5.18 , $p < 0.001$), systolic blood pressure (from mean value of 117.27 ± 10.78 to 108.60 ± 8.64 , $p < 0.001$) and diastolic blood pressure (from mean

value of 81.13 ± 9.03 to 74.73 ± 6.50 , $p < 0.001$). Pulse pressure though reduced, was not statistically significant

Discussion

Effect of practice of yogasan and meditation (yoganidra) for one hour daily for a period of one month was studied on cardiac parameters in 30 medical students. Each subject acted as its own control. The results obtained are discussed as under:

Cardiac parameters .

Discussion

Pulse rate: our study showed statistically significant reduction in pulse rate after practice of yoga, similar finding have reported by other workers after short term yoga training. (A.A KHANAM ET AL (1996)*6., Kaviraja udupa et al (2002)*7., Jyotsana Bharashanker et al (2003)*8 and it is attributed to increased vagal tone & decreased sympathetic activity.*9,10

(Pathak&palan(1997) reported significant reduction in pulse rate in normal & psychosomatic subjects

After one month of yoga practice.*11)

Similar finding decrease pulse rate observed by (vinayak.p.doijad&et al(2012)*11 after short term yoga practices.

And Ankad.RB et al(2011)*12 after short term pranayam & meditation.

Blood pressure :In present study we observed highly significant reduction in systolic blood pressure, & diastolic blood pressure. decreased in pulse pressure is not statistically significant after yoga practice.

Similar finding observed decreased in blood pressure after yoga practice by other researchers are;

., Jyotsana Bharashanker et al(2003)*13 Gandhi et al(2006)*14

Kalwale p.k, shete A.N et al (2006)*15 observed decreased systolic blood pressure after one month of pranayama training but no change in diastolic blood pressure.

Josheph et al (1981)*16 in their study showed significant reduction in systolic & diastolic blood pressure after pranayam & meditation.

(Pathak&palan *18 showed decreased in systolic & diastolic blood pressure after practice of yoga for one month.) vinayak.p.doijad&et al(2012)*17 observed decreased systolic & diastolic blood pressure after short term yoga practice. And Ankad.RB et al(2011)*18 showed similarly decreased systolic & diastolic blood pressure after short term pranayama & meditation

Summary and conclusion:

Yoga is considered as more holistic and comprehensive tool to bring and maintain a perfect homeostasis in psychological and physiological functioning. The present study was aimed to study efficacy of some yogic techniques in bringing alterations in physiological functioning of cardiac parameters in normal healthy volunteers. The subjects selected for the study were medical students of 1st year M.B.B.S., medical college , Baroda.

Subjects were given a scheduled yoga training (Appendix - 1) for one month. Their basal physiological data - cardiac parameters like; Pulse rate (PR) , Blood pressure (Systolic -SBP, Diastolic -DBP, Pulse pressure-PP)were taken before training. Following the yoga training post training data of the same parameters was taken and compared with previous data to analyse the efficacy of one month training.

Individual measurements of each subjects are depicted in master tables- . Statistical analysis with the help of paired 't' test was done between pretraining and post training data. Results of statistics are showed in tables. Histograms of the same are also exhibited.

The results may be summarised as under:

1. Significant reduction in Pulse rate (PR). 2. Significant reduction in Systolic blood pressure (SBP) and Diastolic blood pressure (DBP) , but no significant change in pulse pressure.

It can be concluded that yoga brings biological harmony and better health (cardiac endurance) proving its efficacy in homeostasis.

These effect of yoga is considered to be on Autonomic nervous system (ANS) - decreasing the sympathetic tone and increasing or optimizing parasympathetic activity and thereby reducing blood pressure and heart rate.

Several workers have explained mechanism of reduction in pulse rate and blood pressure as an effect of yoga practice. according to Datey (1975) yoga raises the arousability of cerebral cortex and help in decrease of impulses to hypothalamus , decreasing sympathetic tone thus causing decrease in pulse rate and heart rate .

Gopal et al (1973)(19) suggested that decrease in pulse rate upon practice of yoga is probably due to increase or optimization of parasympathetic activity while decrease in blood pressure may indicate decrease sympathetic tone and peripheral resistance. Datey et al (1969), and Udupa(20) and Singh (1972) also suggested that yogic practices decrease heart rate probably due to increase vagal tone together with decrease sympathetic discharge.)

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20 Original article

CIRCULATING AND CHANGING PHAGE TYPES OF *V. CHOLERAE* ISOLATES AT L.G. GENERAL HOSPITAL, AHMEDABAD, GUJARAT.

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ABSTRACT:

Introduction:

Cholera is endemic in Ahmedabad and its surrounding area. The retrospective study was undertaken from Jan 2011-Aug 2015 to understand Circulating and Changing Phage Types of *V. cholerae*.

Method: A total 171 strains of *V. cholerae* were isolated from total no. of 688 stool samples collected from suspected case of cholera at L.G.General Hospital, Ahmedabad from Jan 2011-Aug 2015. *V.cholerae* was identified by standard microbiology procedure. Isolates were sent to NICED, Kolkata for further confirmation and phage typing.

Result: Out of 171 strains 150 strains were revived at NICED. 148 isolates were identified O1 Biotype El tor serotype Ogawa. Phage T27 was remained the predominant type in all the year according to new phage typing scheme. As per Basu and Mukherjee phage typing scheme T2 phage was predominant in Jan 2011- 2013 and T4 phage was predominant in 2014-2015. Two strains of *V. cholerae* were untypable.

Conclusion: During 2011-13 all strains were belong to Basu & Mukherjee Type 2 Phage type which was totally replaced by Basu & Mukherjee Type 4 in 2013- 2015. Phage T27 was remained the predominant phage type in all the years. Monitoring of the prevalent phage types in area is important as introduction of new phage may herald the onset of an outbreak.

Key Word: *V. cholerae*, Phage type, Cholera, NICED Kolkata

INTRODUCTION:

Cholera is an important public health problem in India. Cholera outbreaks occur seasonally and are associated with monsoon season, warm temperature, heavy rain fall and increased plankton population. *Vibrio cholerae* has a unique ability to exist in an autochthonous state in riverine and brackish water estuaries and coastal waters and can exist in dwarfish forms in response to nutrient deprivation as a viable but non culturable form. It can exist in the gut and attached to the surface of both fresh water and marine copepods. In addition, the genetic assortments and reassortments that are going on in these isolates, equip them appropriately to survive better in

the changing environmental conditions. These also contribute to the increase in drug resistance amongst the *V. cholerae* strains. (1,2)

The geographical distribution of cholera is changing and so is often considered as a re-emerging disease, in part because infections are appearing in novel communities or in communities where the disease had been absent for many years.(3) This may be due to the changes in the environment or climate, following the El Niño phenomenon which has made conditions favourable for cholera worldwide.(4) The problem of global warming(5) and inland incursion of sea water covering more and more of the coastal stretches of land could lead us to the brink of a resurgent pandemic. Worldwide there has been increase in the number of cholera cases and outbreaks in the new communities and with changing profiles.(3,6)

In the Asian region, the Indian subcontinent continues to harbour a major chunk (78%) of cholera cases(3). Outbreaks of cholera including major epidemics have occurred from time to time at various places in India.(6) We studied circulating and changing phage types of *V. cholerae* isolated during Jan 2011 to Aug 2015 at L.G.Hospital, Ahmedabad, Gujarat. Bacteriophage typing is a convenient and highly discriminating method of identifying epidemic strain of *V. cholerae*. (7) *V. cholerae* has been recognised as one of the most common cause of bacterial diarrhoea throughout the world. In an outbreak of an infectious disease such as cholera, it is very important to determine whether the strain have a common origin or different origin. Although a number of problems exist, phage typing of *V. cholerae* is useful for differentiating classical and El Tor strains and for epidemiological purpose. (8, 9)

MATERIAL AND METHOD:

A total 171 strains of *V. cholerae* were obtained between Jan 2011-Aug 2015 from suspected cholera patients at L.G. General Hospital, Ahmedabad. The stool samples of such patients were collected in a sterile container and enrichment was done in alkaline peptone water (APW, pH -8.0) for 6-8 hour. Before the sample was plated, hanging drop preparation was made to confirm the typical darting motility of the *V. cholerae*. If present, both directly from the sample and after enrichments in alkaline peptone water. The Samples were plated on MacConkey agar, Blood agar and Thiosulphate citrate bile salt sucrose agar (TCBS).(10) The suspected colonies were subjected to Gram stain, oxidase, motility and string tests. The Gram negative rods that were oxidase positive, actively motile and string test positive were subjected to further biochemical tests.[10] These were indole, triple sugar iron agar, cholera red reaction, citrate utilization, ornithine decarboxylase, lysine decarboxylase, arginine dihydrolase and sugar fermentation tests using sucrose, mannitol, arabinose and mannose.(10) Biotyping was performed by the Voges– Proskauer test, chick red cell agglutination test, sheep RBC haemolysis test and Polymyxin-B (50 unit disc) sensitivity test.[10] Serotyping was carried out by slide agglutination using Ogawa and Inaba antisera.[2] All the isolates belonged to the *V. cholerae* El Tor biotype and Ogawa serotype. All isolates were sent to National Institute of Cholera and Enteric Disease (NICED), Kolkata, for Confirmation and Phage typing.

RESULT AND DISCUSSION:

The phage typing scheme was proposed by Basu and Mukherjee in 1968, and since it has been in continuous use for typing of *V. cholerae* biotype El Tor strain. In 1969, all six phage types were reported in India and abroad. However, Phage types 2 and 4 were predominant.

In our study number of cases were from slum dwellings or suburban areas in and around Ahmedabad. *V. cholerae* is a known faeco-oral pathogen and indeed, infection rates were significantly higher in areas with poor sanitation. Mostly, the slums are occupied by migrant population where the hygienic conditions are quite often compromised. Interestingly, the importance of weather and climate as having effect on water quality is being increasingly recognized.⁽⁴⁾ In this study, all the cases presented during the months of June to October. The occurrence of cases correlated well with the onset of monsoon in this region. Rains increase the level of surface water and have been shown to be linked to leakage of water pumps and mixing of stagnant water through broken pipelines.^(11,12) Such untreated water sources are used by people living in slum dwellings and suburban areas for bathing, cooking and drinking which enhances the chances of infection. All the isolates were *V. cholerae* O1, biotype El Tor, serotype Ogawa. Phage typing was done for the isolates collected during Jan 2011 to Aug 2015.

During the period of Jan 2011-Aug 2015, 150 strains were identified as *V. cholerae* at NICED, Kolkata. Out of 150, two strains of *V. cholerae* were untypable during the year 2013. 12 strains were not revived at NICED and 9 isolates were contaminated. All isolates were *V. cholerae* O1, Bio types El Tor. From 2011- 2013 all strains were belong to Basu & Mukherjee Type 2 Phage type which were totally replaced by Basu & Mukherjee Type 4 Phage in 2013-2015. According to new phage typing scheme T27 was predominated phage type during Jan 2011-Aug 2015 (Table 1). The results of phage typing were consistent with the overall countrywide epidemiological data²¹ which report type 27 to be the predominant one. The present findings corroborated well with previous studies⁽¹³⁾. This suggests that a particular clone of *V. cholerae* O1 strain is probably circulating all over India. Two Untypable strain were found during 2013.

Though fluid and electrolyte replacement either by oral rehydration or intravenous fluid therapy is the treatment of choice for acute diarrhoea, antibacterial agents are indicated as useful adjuncts for the treatment of cholera as these shorten the duration of hospital stay, stop excretion of vibrios in the stool and also minimize the requirement for fluid.⁽¹⁴⁾

The study showed that there was no readily discernible sex pattern but male outnumbered the females (Table 3). Most cases were in age group of 0-5 years followed by 6-10 years. However Cholera affects all ages and both sexes, infection rate is increasingly reported in paediatrics (Table 2).

This finding is in contrast with several studies from Mumbai,⁽⁷⁾ Bikaner⁽¹⁶⁾ and Ludhiana⁽¹⁷⁾, where all strains were belonged to type T4. At present, the prevalent biotypes in India are T2 and T4.⁽⁶⁾ But, in the present study prevalent biotypes as per Basu & Mukherjee typing scheme are T2 and T4 and New phage typing scheme are T 27, T 26, T 21 and T 7.

Continuous monitoring of the changing trend of phage type is a must, as introduction of new phage may herald the onset of an outbreak and resistance to antibiotic. Strong regional commitment to surveillance and preparedness for outbreaks should be maintained and timely information should be given to the health authorities as well as to the public.

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Table 1: Total 171 ,Tyapable:148,Untypable:2,Nogrowth:12,Contaminated:9

Table:1 Distribution of Phage types Years wise

Phage group																				
Years	Type																			
	Basu & Mukherjee (N-148)		New Scheme(N-148)																Total	
	2	4	4	7	1	1	1	1	1	2	2	2	2	2	2	2	2	NG	UT	Cont.
2011	9	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	7	2	-	2
2012	15	-	1	-	-	-	1	-	-	-	1	-	-	-	-	2	10	3	-	2
2013	46	24	-	1	2	1	-	1		1	3	-	3	2	1	1	54	1	2	4
2014	-	24	-	3	-	-	-	-	4	1	0	-	0	0	-	3	13	2	-	1
2015	-	30	-	5	-	-	-	-	4	4	-	1	-	-	-	5	11	4	-	
Total	70	78															12	2	9	171

Table: 2 Distribution of Cholera case amongst different age groups (n-171)

Year s	0-5	6-10	11-15	16-20	21-25	16-30	31-35	36-40	41-45	46-50	51-55	To tal
2011	5	7	1	-	-	-	-	-	-	-	-	13
2012	13	6	1	-	-	-	-	-	-	-	-	20
2013	44	20	8	-	2	-	-	-	1	-	2	77
2014	13	9	4	-	-	-	-	1	-	-	-	27
2015	21	06	3	2	-	2	-	-	-	-	-	34
Total	96	48	17	2	2	2	0	1	1	0	2	171

Table 3: Sex wise distribution of cholera case (n- 171)

Years	Male	Female	Total
2011	8	5	13
2012	11	9	20
2013	36	41	77
2014	16	11	27
2015	17	17	34
Total	88	83	171

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21_Original article

CORRELATION BETWEEN CENTRAL CORNEAL THICKNESS, INTRAOCULAR PRESSURE, OPTIC DISC SIZE AND CUP-DISC RATIO IN NORMAL POPULATION

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ABSTRACT

- **BACKGROUND** : To study the central corneal thickness (CCT) and its correlation with age, gender, intra ocular pressure (IOP), optic disc size and cup/disc (C/D) ratio in healthy subjects.
- **METHODS** :
A cross-sectional prospective study was carried out at a tertiary eye care hospital, from August 2012 to July 2013. Subjects (n = 700) included healthy patients presenting for routine eye check up or refractive error correction. Informed consent was obtained from all. The selection of eye was randomized to avoid bias. A complete ocular examination was done including visual acuity, refractive error, anterior and posterior segment examination, intraocular pressure examination with Goldman applanation tonometry, optic disc size and C/D ratio with Heidelberg retina tomography (HRT). Central corneal thickness (CCT) was measured by Optical Pachymeter.
- **RESULTS**: Sample included a total of 700 normal subjects (Males : 349, Females : 351). Mean central corneal thickness of the study was $520.9 \pm 20.51 \mu$. Mean age of the study sample was 34.83 ± 11.14 years (20 years to 70 years). Subjects were divided decade wise for analysis (20-30 y =297, 31-40 y=225, 41-50 y=94, 51-60 y=72, 61-70 y=12). Mean central corneal thickness of the study group was $520.9 \pm 20.51 \mu$ with average readings of males being $520.40 \pm 20.53 \mu$ and

females $521.39 \pm 20.53 \mu$. No significant difference of CCT was seen between males and females ($P=0.52$). Average CCT in different age groups (decade wise) was as follows: (20-30y – $520.18 \pm 20.64 \mu$, 31-40y – $522.20 \pm 20.54 \mu$, 41-50y – $519.28 \pm 20.69 \mu$, 51-60y – $523 \pm 20.53 \mu$, 61-70y – $514 \pm 20.77 \mu$). No significant difference of CCT was seen with age ($p=0.981$). No significant difference of CCT was found with IOP ($p=0.189$). Heidelberg retinal tomography (HRT) was done in 413 out of 700 normal subjects for the measurements of optic disc size and C/D ratio. Mean optic disc size was $1.506 \pm 0.16 \text{ mm}^2$. No significant difference of CCT was found with optic disc size ($p=0.724$). No significant difference of CCT was found with C/D ratio ($p=0.692$).

- **CONCLUSION:** There was no significant correlation of CCT with age, gender and IOP in these normotensive subjects. There was also no significant correlation of CCT with optic disc size and C/D ratio in normal healthy subjects.

Key words: Central Corneal thickness, Intra Ocular Pressure, Optic disc size, Cup disc ratio

INTRODUCTION

Thin central corneal thickness (CCT) has been shown to be a powerful risk factor for the progression of ocular hypertension (OHT) and preperimetric glaucoma to primary open-angle glaucoma (POAG). Intraocular pressure (IOP) is a key element in the management of glaucoma⁽¹⁾ and it should, therefore, be measured using a reliable technique with high degree of accuracy. Though Goldman applanation tonometry (GAT) is the most widely used and current “gold standard” for IOP measurement, readings of IOP made with GAT are affected by central corneal thickness (CCT)⁽²⁾. Goldman and Schmidt felt that significant CCT variations occurred only rarely in the absence of corneal disease and thus assumed a “normal” CCT of 500μ for their instrument⁽³⁾. However, studies have shown that there is variation in the mean CCT among individuals with healthy eyes^(2, 4), in patients with different types of glaucoma⁽⁵⁾ and in presence of pseudo-exfoliation syndrome⁽²⁾. Several studies have suggested 0.014 – $0.179 \text{ mmHg}/0.01 \text{ mm}$ increase in CCT. This small change could be clinically significant especially in individuals predisposed to glaucoma^(6, 7). Moreover, failure to adjust IOP for CCT variation could lead to inappropriate targeting of IOP and setting targets very high for patients having thinner corneas and very low for those with thicker corneas. The cornea and optic disc both fill scleral “portholes” of the eye and due to the continuity of the cornea, sclera and optic disc lamina; there is a possibility that CCT may be extrapolated to characteristics of optic disc itself⁽⁸⁾. This study was undertaken to measure the CCT and determine its correlation with age, gender, IOP, optic disc size and cup disc ratio in normal healthy subjects.

MATERIALS AND METHODS

A prospective study was carried out at a tertiary eye care hospital from August 2012 to July 2013. Subjects included in the study were healthy patients presenting for routine eye check up or refractive error correction. Informed consent was obtained from all. Data from one eye of each subject was taken. The eye selection was randomized to avoid bias. A complete ocular examination was done including visual acuity, refractive error, anterior and posterior segment examination, intraocular pressure with Goldman applanation tonometry, optic disc size and C/D ratio with Heidelberg retina tomography (HRT). Central corneal thickness (CCT) was measured by Optical Pachymeter.

Inclusion Criteria included age more than 20 years; visual acuity > 20/40; refractive error < ± 4 D and IOP < 20mm Hg.

All subjects with history of ocular trauma, intra ocular surgery, diabetes, positive family history of glaucoma, optic disc size < 1.3mm or >2mm on HRT and with optic nerve pathologies were excluded from the study.

All prospective subjects completed a questionnaire to scrutinize their eligibility for the study. Visual acuity was tested by Snellen visual acuity chart. A slit lamp examination of the anterior eye was conducted. CCT was measured by Optical Pachymeter. Average of three readings was recorded as the CCT. IOP was measured with GAT before pupillary dilation. Refraction of each eye was measured using an autorefractor (Canon R-F 10m Auto Refractometer). Direct ophthalmoscope was used for fundus examination with dilated pupils. Optic disc size and C/D ratio were measured with HRT.

GraphPad Prism 6 trial version was used. Pearson's correlation coefficient was used to find out correlation of CCT with IOP, age, gender, optic disc size and C/D ratio.

RESULT

Table 1 – Age

Group/ CCT

Age group	Mean CCT (μ)
20 – 30	520.18±20.64
31-40	522.2±20.54
41-50	519.28±20.69
51-60	523±20.53
61-70	514±20.77

Chart 1 – Age Group/CCT

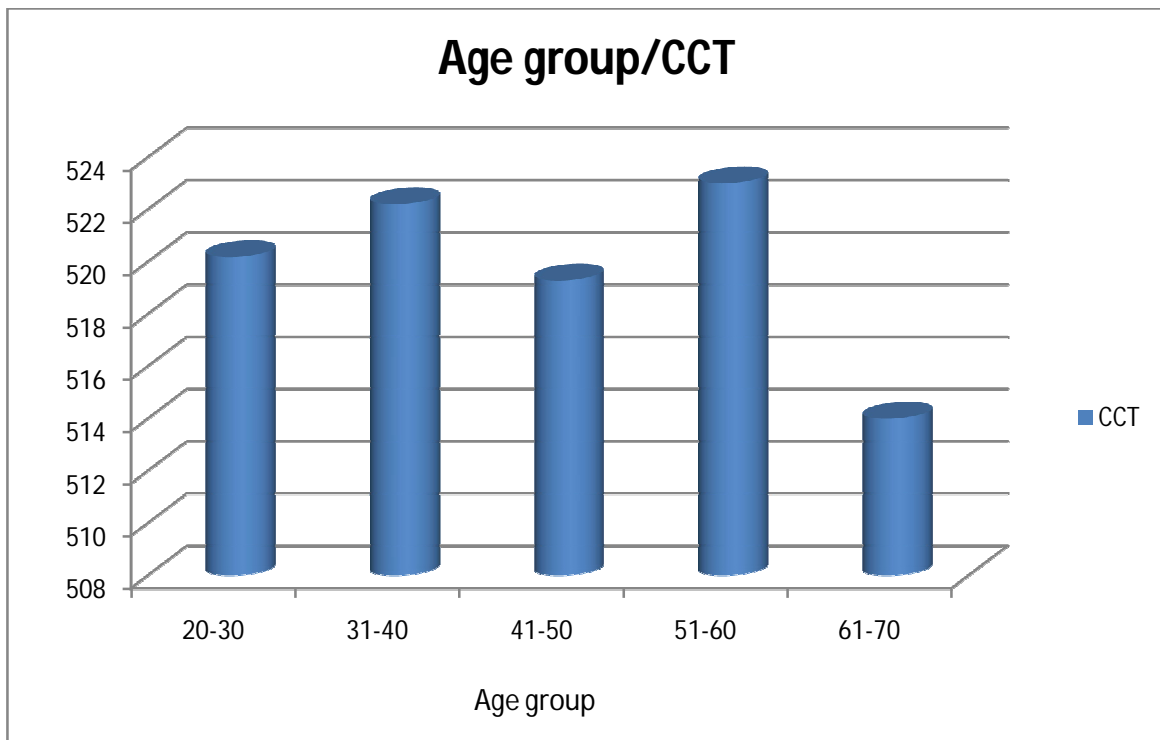


Table 2 – Gender/CCT

Gender	Mean CCT(μ)
Male	520.40 \pm 20.53
Female	521.39 \pm 20.53

Chart 2 – Gender/CCT

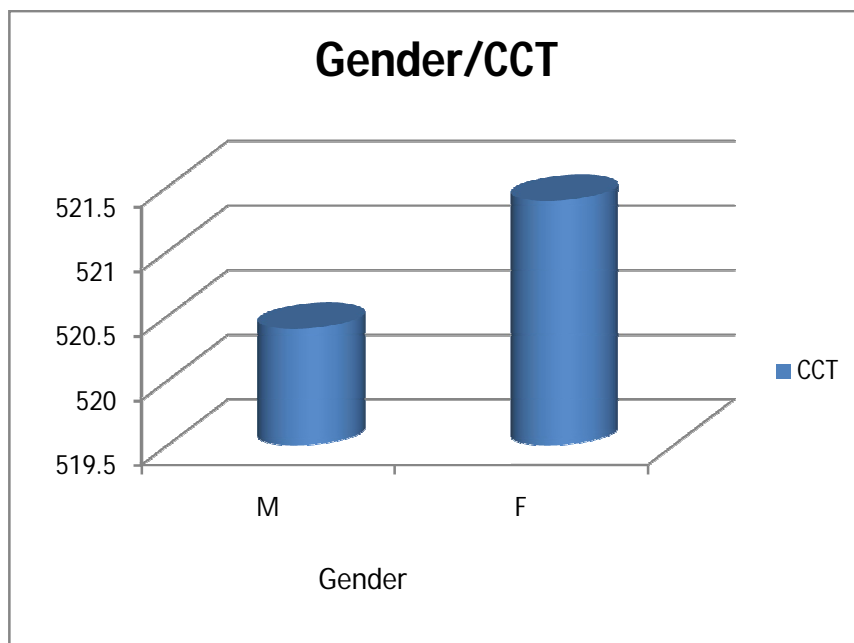


Table 3 – Optic disc size / CCT

Optic disc size	Mean CCT(μ)
1.2 – 1.39	517.98 \pm 20.66
1.4 – 1.59	517.86 \pm 19.74
1.6 – 1.79	519.66 \pm 19.86
1.8 - 2	515.39 \pm 19.07

Chart 3 – Optic disc size / CCT

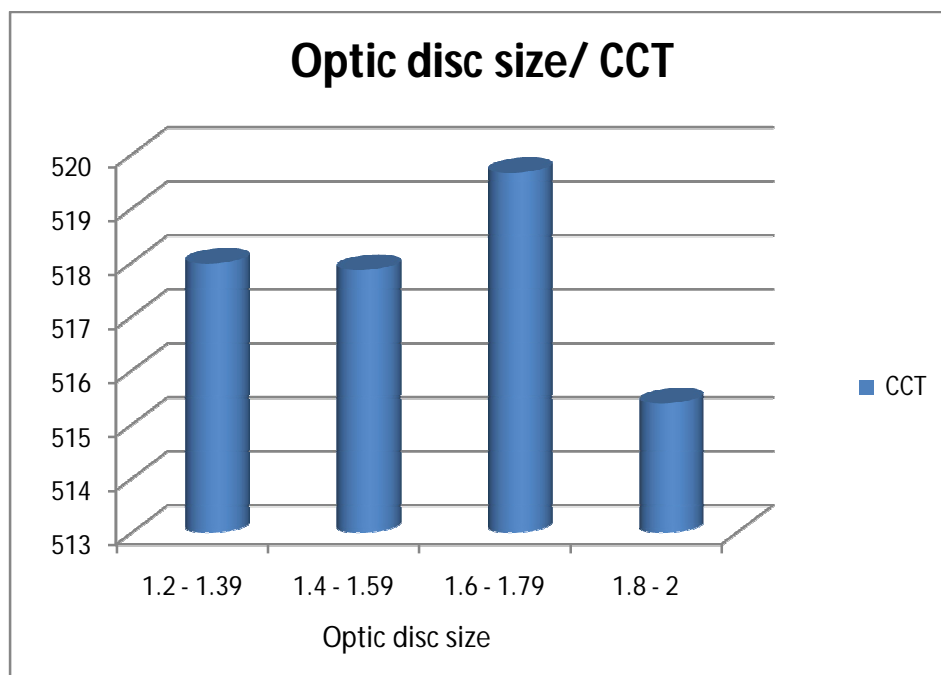


Table 4 – IOP/CCT

IOP	Mean CCT(μ)
10 – 13	522.13 \pm 20.44
13 – 16	519.9 \pm 20.55
16 – 18	521.78 \pm 20.53
18 - 20	524.36 \pm 20.54

Chart 4 – IOP/CCT

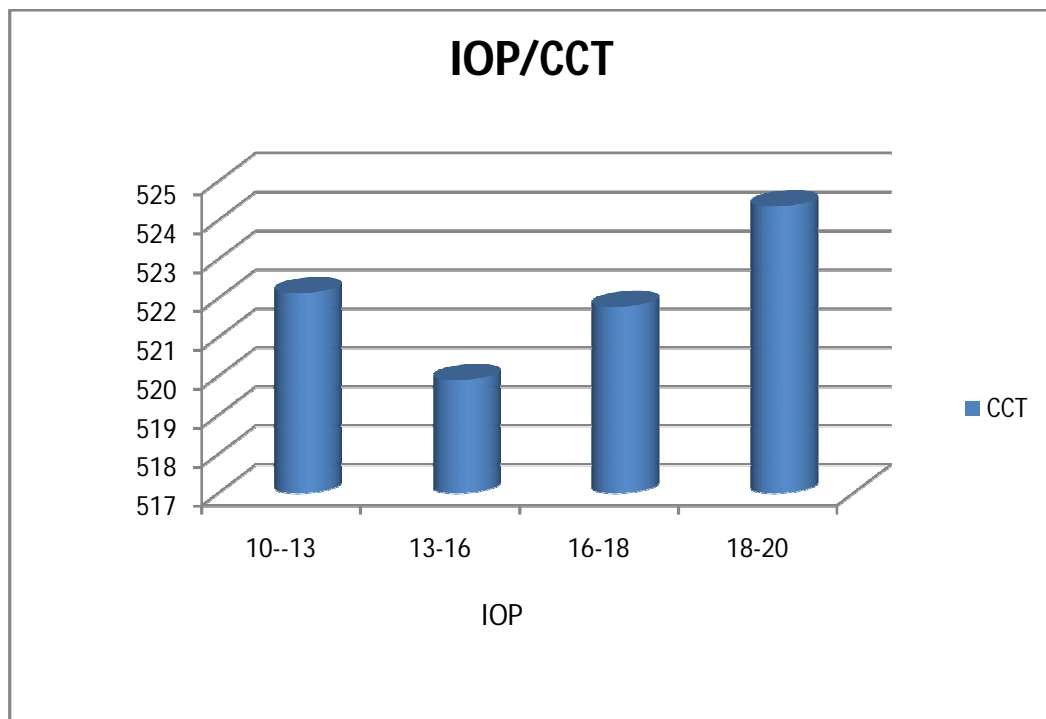
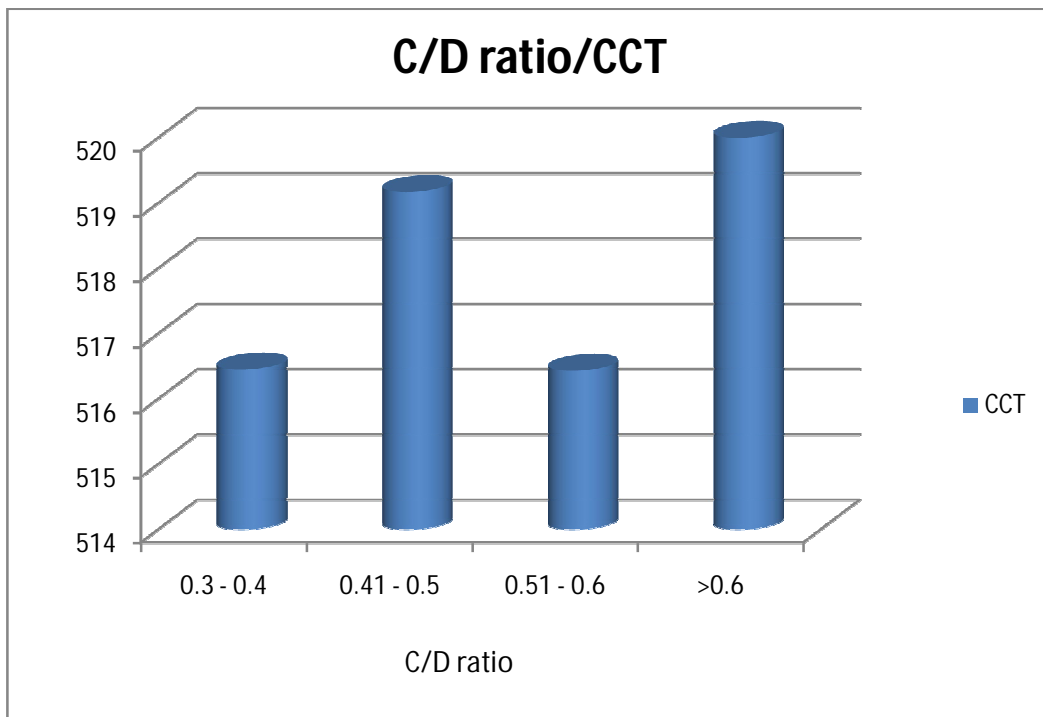


Table 5 – C/D ratio / CCT

C/D ratio	Mean CCT(μ)
0.3 – 0.4	516.45 \pm 19.84
0.41 – 0.5	519.17 \pm 19.76
0.51 – 0.6	516.43 \pm 20.52
>0.6	520 \pm 18.79

Chart 5 – C/D ratio / CCT



Sample included a total of 700 normal subjects of which 349 were males and 351 females. Mean central corneal thickness of the study was 520.9 \pm 20.51 μ . Mean age of the study sample

was 34.83 ± 11.14 years. Subjects were divided decade wise for analysis (20-30 y =297, 31-40 y=225, 41-50 y=94, 51-60 y=72, 61-70 y=12). Mean central corneal thickness of the study group was $520.9 \pm 20.51 \mu$ with average readings of males being $520.40 \pm 20.53 \mu$ and females $521.39 \pm 20.53 \mu$. No significant difference of CCT was seen between males and females ($P=0.52$) (Chart - 2). Average CCT in different age groups (decade wise) was as follows: (20-30y – $520.18 \pm 20.64 \mu$, 31-40y – $522.20 \pm 20.54 \mu$, 41-50y – $519.28 \pm 20.69 \mu$, 51-60y – $523 \pm 20.53 \mu$, 61-70y – $514 \pm 20.77 \mu$). Weak negative correlation was found between CCT and age ($r= -0.001$) which was statistically insignificant ($p=0.981$). No significant difference of CCT was found with IOP ($P=0.189$). HRT was done in 414 out of 700 normal subjects for the measurements of optic disc size and C/D ratio. Mean optic disc size was $1.506 \pm 0.16 \text{ mm}^2$. Weak negative correlation was found between CCT and optic disc size ($r= -0.017$) which was statistically insignificant ($p=0.724$). No significant difference of CCT was found with C/D ratio ($p=0.692$). One way ANOVA test was used which gave no statistical difference between the age groups ($p = 0.411$) (Chart - 1). Patients were divided into four groups according to their optic disc size, C/D ratio and IOP (Charts 3,4 and 5). One way ANOVA test was used for each of these parameters and there was no statistical difference between optic disc size groups ($P= 0.838$), C/D ratio groups ($P = 0.576$) and IOP groups ($P= 0.485$).

DISCUSSION

Ehlers et al ⁽⁵⁾ reported that the Goldman tonometer provided accurate readings only when the CCT was 0.52 mm; they calculated that applanation tonometry overestimated or underestimated IOP by approximately 5 mm Hg for every 0.070 mm of deviation in corneal thickness. More recently, Whitacre et al ⁽⁷⁾ reported that thin corneas may result in a 4 to 9mm Hg underestimation of IOP and thick corneas may result in overestimation of the IOP by 6.8mmHg.

In a population-based study of Malay persons aged 40 to 80 years by Wu RY et al⁽⁹⁾, CCT was found to be correlated with rim area and cup-to-disc ratio (tomography measurements) only in POAG patients, independent of axial length, IOP, disc area, and other confounding factors. No significant correlation between CCT and optic disc parameters was seen in subjects without glaucoma which was similar to this study.

Barbara Nemesure et al ⁽¹⁰⁾ studied age-sex distribution of CCT among 1142 participants (2276 eyes) with a mean age of 64.3 years; 58% were women. Though an inverse relationship was found between CCT and age ($P<.001$), there were no significant differences in corneal thickness between men and women ($P>.05$) which was similar to this study.

Eghosasere Iyamu et al ⁽¹¹⁾ studied one hundred and thirty eyes from 130 subjects (mean age= 47.8 ± 16.8 years) including 77 males and 53 females . They found that CCT of normotensive Nigerian adults decreases with increasing age. There was no correlation between

CCT and IOP in normotensive subjects. CCT was not significantly influenced by gender, corneal curvature and corneal diameter which also supports this study.

Dr. Apala Bhattacharya et al⁽¹²⁾ studied the relation between central corneal thickness and optic disc size in normal Subjects and patients with primary open angle glaucoma. In the control group there was a weak negative correlation ($r = -0.141$) which was statistically insignificant ($p=0.092$). In POAG patients the negative correlation ($r = -0.256$) was statistically significant ($p=0.0063$). The results of this study were also similar to our study.

Mean central corneal thickness (CCT) in this study was found to be 520.9 ± 20.51 microns which was similar to Japanese population (517.5 ± 29.8 micron)⁽¹³⁾.

In a recent study, Pakravan et al. (2007)⁽⁸⁾ reported a significant negative correlation between CCT and optic disc size in a small hospital-based population. The authors concluded that a thin CCT might be a marker for more deformable discs being more susceptible to the effects of increased IOP.

This study was undertaken to find out any possible relationship between CCT and optic disc size in normal subjects. Optic disc size influences the susceptibility to POAG. Higher chance of excavation of superior and inferior disc area is associated with increased disc size because of lack of connective tissue support in larger disc and exposes the disc to more axonal damage^(14,15,16).

In this study average optic disc size was 1.506 mm^2 which was smaller than that found in Caucasians in other studies^(17,18).

Studies which have found a relationship between CCT and ONH parameters did so only in ocular hypertensive and glaucomatous eyes^(1, 4, 19). CCT also did not correlate with gender in the above mentioned studies. There was no correlation between CCT and IOP or age in this sample.

CONCLUSION

Mean central corneal thickness (CCT) was found to be 520.9 ± 20.51 and it had no correlation with age, gender, IOP, optic disc size and C/D ratio in normal population.

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Original article:

STUDY OF HEART BLOCKS IN ACUTE MYOCARDIAL INFARCTION IN DIABETIC AND NON-DIABETIC PATIENTS

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Abstract:

Introduction: This was the study to study Heart Blocks in acute Myocardial infarctions patients specifically in patients with or without diabetes. Material and Methods: The Study included ninety six cases of acute myocardial infarction with and

without diabetes. The cases were studied in ICU of a tertiary care urban hospital. Results and Discussion: We observed a ratio of anterior to inferior wall MI 3.1 in non-diabetics while the ratio is 2.1 in diabetics. Female were relatively protected against coronary disease. The frequency of block was less in females of both the groups and even lesser in diabetic group. On the other hand, diabetic males have greater frequency of block than non-diabetic males. Complication rate and mortality is no doubt higher in the diabetic group, but it was not as bad as described by most western authors. Overall complication rate was higher in the diabetic group (39% in non-diabetics and 58% in diabetics). The most important complication was acute LVF (21% in non-diabetics vs 42% in diabetics). Conclusion: All patients with block did not require specific treatment. Clinical status is most important consideration. Pacemaker is like second marriage with its new set of trouble and might needed to be avoided unless indication is absolute.

Keywords: Diabetes, Myocardial Infarction, Heart Block, Pacing

INTRODUCTION

Technological advance have revolutionized the diagnosis and treatment of heart blocks. Just a few decades ago, the knowledge about impulse generation, its pathways and various blocks was limited. Diagnosis depended on clinical examination and ECG findings only. Technological explosion lead to invention of new techniques, continuous monitoring in Intensive Care Units (ICU), Holter technique, Ultrasonography, His Bundle electrograph and electrophysiological studies have tremendously increased our understanding of heart blocks. Pacemaker implantations have revolutionized the treatment of heart blocks. In many cases the damage to heart muscle by infarction is not severe enough to cause fatal outcome but death occurs as a result of failure of conduction of impulses. This defect is sometimes temporary and if the patient is tided over the crisis by a Pacemaker block reverts by natural healing and the patient is saved.

Hence, complete knowledge about the subject of heart block is important for all physicians, both generalists and cardiologists.

Some argue that we cannot practice high-tech medicine here in our setting and so all this knowledge is impractical and unnecessary. Well, the view is incorrect. Most of the high-tech medicine when newly invented is costly and located in a few centers to start with, but gradually it spreads over to other specialist centers and subsequently to

all general hospitals all over the world. Then it becomes a common knowledge. CAT Scan, By-pass surgery, cardiac Catheter technique are well known examples. CAT Scan, Ultrasonography and Radionuclide scanning are commonly done today in most of the cities.

Furthermore, our clinical diagnosis improved by retrospective application of knowledge acquired from high-tech investigations. Let us quote a few examples in diagnosis of 1st, 2nd and 3rd degree heart blocks. These findings were missed before the days of high-tech investigations. Example is Barlow's syndrome (Prolapse of Mitral Valve syndrome). This syndrome can now be diagnosed within a matter of seconds by mere clinical auscultation, but the knowledge required for diagnosis has first been obtained by high-tech study. The systolic click and the late systolic murmur were completely missed or went unnoticed before the syndrome was established by improved techniques. It was said by Goethe, the German Philosopher that "one sees only what one knows."¹ This proves our point that high-tech knowledge is equally essential to all of us and we should keep abreast of the recent advances.

The above consideration has prompted us to select the subject of heart block in myocardial infarction. Secondly, we have selected patients in two groups, with and without diabetes. Diabetes Mellitus is associated with accelerated atherosclerosis and predisposes to macro vascular and micro vascular diseases. Diabetes doubles the risk of C.V. (cardiovascular) stroke and trebles the risk of coronary disease.² It wipe out the relative protection of young females against coronary disease. Diabetic males and females are at equal risk of coronary disease. Diabetic males have two to three times the risk of developing coronary disease as compared to non-diabetic males and diabetic females have nearly twenty times risk of developing coronary disease as compared to non-diabetic females.³ These are western statistics. In our country in less affluent and poor society the profile of diabetes is low and it is our impression that complications in our diabetic patients (even untreated or insufficiently treated) are fewer and milder than anticipated. So, we have thought of studying this problem at the same time. We have therefore included two separate groups of equal number of patients with and without diabetes.

Our aims of this study are to study the incidence of and types of conduction defects in patients of acute myocardial infarction. We also aimed to study various types of conduction defects in relation to the site of infarction. We studied the role of drug therapy & pacemaker therapy in heart blocks. We also studied clinical findings, ECG findings, mortality, morbidity etc., in various heart blocks in cases with and without diabetes.

MATERIAL AND METHODS

The present study includes ninety six cases of acute myocardial infarction, forty eight with diabetes and forty eight without diabetes. The cases were studied in ICCU of Sheth V.S. General Hospital.

All cases were examined in detail as per proforma. First, Complete history was obtained. Then a thorough clinical examination was carried out. C.V.S. was specially examined in minute detail. Heart sounds were studied, murmurs noted and gallop was looked for. Special attention was given to varying intensity of first heart sound, neck and pulsations and the examination was repeated at suitable intervals depending upon the clinical condition. The cases under study were investigated as per proforma. ECGs were recorded at intervals according to necessity. All cases were on cardiac monitor for initial two or three days or even longer if necessary. This helped me to study the development of heart blocks and subsequent alterations in the block patterns. Drug therapy was studied on monitors. We could pace two cases of complete heart block. Both were very serious. One patient died in spite of all efforts but what is important, we could save the other one, who made a complete recovery. All the relevant investigations including enzyme studies were done and were repeated when necessary. The cases were treated according to the standard customary regime practiced in the ICCU. Rest and oxygen, sedatives and tranquilizers were given according to need. Coronary dilators (Isosorbide dinitrate) for angina were given as per indication.

RESULTS AND DISCUSSION

In our study, we saw a ratio of anterior to inferior wall MI 3.1 in non-diabetics while the ratio is 2.1 in diabetics.

Table-1: Site of AMI and Diabetes

	AMI without DM	AMI with DM
Anterior Wall MI	33	30
Inferior Wall MI	12	16
Double wall MI	3	2

Incidence of heart block in both the groups is equal in our series, in both the groups 31% had block, roughly on in three cases. In AMI without diabetes, majority of blocks were in Anterior wall MI and in AMI with diabetes majority blocks were in Inferior wall MI.

The observation based on this small series may not necessarily apply to general population but certainly provide useful informations.

On this whole, the incidence of AMI increases as the age advance. In our series non-diabetic males and females have the highest incidence in sixth decade. In diabetic males the incidence is even in fifth, sixth and seventh decades suggesting earlier involvement. In diabetic females the maximum incidence is in the seventh decade. Male to female ratio is 5:1 in non-diabetic group and 3:1 in diabetic group suggesting higher incidence due to diabetes in females.

Table-2:SITE OF INFARCTION IN RELATION TO BLOCKS

TABLE	AMI without DM			AMI with DM		
	Numbers	Block	%	Numbers	Block	%
Anterior wall MI	33	10	66	30	6	40
Inferior wall MI	12	4	27	16	9	60
Double wall MI	3	1	7	2	-	-
Total	48	15	100	48	15	100

The risk of AMI was found to be twice as high among diabetics than among non-diabetic patients ($P < 0.001$).⁴In diabetics, the risk increases three times for males and twenty times for females and ultimately becomes equal for both genders. Our series suggest increased incidence for females but it is only marginal.

In Framingham study⁵, no premenopausal woman in a Cohort of 2873 cases of non-diabetic females developed AMI during twenty-four years follow-up. However, after

menopause there was a striking increase in coronary disease in women and the incidence was equal to that in males.

In Bell's series of autopsies⁶, vascular disease in general increased from 24.8% in non-diabetic to 49.3% in diabetics. Many other authors have reported 2.5 times incidence in diabetics. However, not all authors agree on this point. Waller in this necropsy study reported equal incidence in both groups.

In 1968, International Atherosclerosis Project⁷ 34,000 autopsies were studied, Diabetic were to have more fat deposits, fibrous plaques, calcification and coronary stenosis.

Kessler reported 21,447 cases seen at Joslin clinic. Significant excess risk of death from coronary disease was noticed in diabetics.⁸

A. K. Maity et al⁹ have reported males to females ratio as 7:1 in Non-diabetics and diabetics, but it was probably due to less number of female beds in ICCU and so not comparable.

On the whole, the general opinion is that coronary disease is more common in diabetics than non-diabetics and tends to occur at earlier age in diabetics. Non-diabetic females are protected against coronary disease, while diabetic females are as vulnerable as males.

Macroangiopathy in larger arteries is age related and so the incidence of A.M.I. increases with age in both genders. Diabetic females are more prone to get MI in comparison to non-diabetic females.

Table-3:BLOCKS IN RELATION TO GENDER

AMI without DM			AMI with DM		
Male	Female	Total	Male	Female	Total
13	2	15	14	1	15

In diabetics, abnormal fat and carbohydrate metabolism increases the tendency to atherosclerosis and thus explains increased incidence of coronary disease. In diabetic females the acceleration of macroangiopathy is at a faster rate in comparison to diabetic males. This is the reason why the diabetic females are at almost equal risk in comparison to males. In addition, microangiopathy of small vessels is specific to diabetes and this is additional reason why coronary disease is more common in diabetics.

The question is why non diabetic females are so well protected against coronary disease? Females take less muscular exercise than males and have larger fat content in the body. Even so they have less coronary disease: To explain this on the basis of testosterone and oestrogen is oversimplification. Oestrogen therapy is not known to protect males against coronary disease. There are many diseases which are more common in males, e.g. Gout, Peptic Ulcer and so on. All of them cannot be explained on hormone therapy. It is an unsolved mystery.

In our series, the ratio of Anterior MI to inferior MI is 3:1 in non-diabetics and 2:1 diabetics suggesting more inferior wall involvement in latter group. In contrast, Maity et al⁹ report increased inferior wall involvement in non-diabetics.

HEART BLOCK:

The incidence of heart block in our series is equal in both the groups and it is 31% (roughly, one in three). The findings of Maity et al⁹ are at variance. Their incidence is one in two cases in diabetics (53%) and one in seven (15%) in non-diabetics. Compared to our study their incidence of block is much lower in non-diabetics and much higher in diabetics.

In Our series majority of blocks were in Anterior wall MI. In non-diabetics and Inferior wall MI in diabetics. Three cases reverted to normal out of fifteen in non-diabetics and eight reverted to normal in diabetic group.

In Our series, AV Nodal blocks were more common in Inferior wall MI. In both the groups and intraventricular blocks are more common in Anterior wall MI in both groups. This is explained on the basis of blood supply. AV node is supplied by posterior descending artery and His-Purkinje system by anterior descending artery.

Overall incidence of intraventricular blocks (bi and tri-fascicular blocks) is 10-20% in AMI.¹⁰In our series, the overall incidence of bi and tri-fascicular blocks was 24% (23 out of 96) out of which 2/3rd were in non-diabetic group and 1/3rdin diabetic group. Diabetic group had more incidence of AV Nodal involvement.

In our series, two out of eight non-diabetic females had a block and one out of thirteen diabetic females had a block. The frequency of block was less in females of both the groups and even lesser in diabetic group. On the other hand, diabetic males have greater frequency of block than non-diabetic males.

COMPLICATIONS:

Overall complication rate was higher in the diabetic group (39% in non-diabetics and 58% in diabetics). The most important complication was L. V. F. (21% in non-diabetics and 42% in diabetics).

In the non-diabetic group, acute LVF (Left Ventricular Failure) rate was more in patients with block and in diabetic group, acute LVF cases were more in patients without block. This paradox is difficult to explain.

In Maity's⁹ series acute LVF rate was 14.4% in non-diabetic group and 22.5% in diabetic group (Patients with and without blocks have been included as a whole group). Another interesting feature is that LVF was more common in Anterior wall MI in both the groups.

IMMEDIATE MORTALITY:

One patient died in non-diabetic group and three patients died in diabetic group. Two cases who went in DAMA (Discharge against Medical Advice) (without block) were probable deaths judging from their critical conditions. This means, death rate was higher in diabetic group. The three cases, who died in hospital had a heart block (complete heart block).

Maity et al⁹ report death rate of 30% in diabetic group and 16.5% in non-diabetic group. Our death rate is much lower compared to his series. Ours is a short follow up even so our results seem creditable. Western authors report a death rate varying from 6-20% in non-diabetic and 10-25% in diabetics.

MANAGEMENT OF HEART BLOCK:

Out of fifteen cases with heart block in non-diabetic group, twelve cases were not given any specific drug for the blocks, three cases were treated with drugs (Atropine and Orciprinaline). Out of those untreated block cases one case of LAHB (Left Anterior Hemi-Block) reverted to normal, while out of those treated cases two cases of AV Node lesion reverted to normal. The third with complete AV block persisted.

In diabetic group, 8 blocks out of 15 reverted to normal, out of which 6 had AV Node lesion, one LAHB and one complete AV block. Three cases were treated with atropine, orciprinaline or steroids, four patients were not given any drug for the block and one was paced who later reverted to normal. Out of the seven cases which did not

revert to normal four were not given any drug, the remaining were treated with atropine, orciprinaline or steroids. One case of complete AV block was paced after a drug trial but did not survive.

Block per se is not an indication for drug therapy. Clinical status has to be taken into consideration. In our series, both groups had equal number of blocks and the record of reversal is better in diabetic group.

PACING:

Hemodynamic status is most important consideration for pacing. According to Marriott¹¹ pacemaker is like a second marriage with its new set of troubles. Higher the lesion in the conducting system, lower the indication for pacing and vice versa. Increased AH interval and normal HV indicates higher lesion while increased HV interval and normal AH interval indicates lower lesion. Out of the two cases of complete AV block which were paced, we could save one which was a feather in our cap. He has a long standing severe diabetes poorly controlled in earlier years but later well controlled with Insulin. He developed Inferior wall infarction and complete AV block. He was in shock and suffered hypoxic encephalopathy. Drug therapy failed to revert his blocks. He was paced and he made a complete recovery. His block reverted to normal and went home a complete recovery. His block reverted to normal and went home well without hesitation he owes his life to temporary pacemaker.

TREATMENT OF DIABETES:

In the diabetic group, all cases except three were treated with Insulin. Two cases did not need anti-diabetic treatment and one cases was already stabilized on oral hypoglycemic agent and was continued. The general opinion is that oral hypoglycemic agents are not favored in acute conditions. All author recommend Insulin therapy^{4,12} which provides physiological control. During infarction, there is a tendency of diabetes with diabetes have done so well. It is that the spectrum of diabetes in our country is different from that in Western races.

We would like to mention that our patients in ICCU in general have done extremely well with low mortality. Both the groups have done well. Number of factors seem to have played a part in this outcome. Excellent medical care, continuous monitoring and instant appropriate treatment by trained staff is the most important.

CONCLUSIONS:

Female were relatively protected against coronary disease. The protection is lost in diabetic females to a great extent. Complication rate and mortality is no doubt higher in the diabetic group, but it was not as bad as described by most western authors. Our patients with diabetes have done very well and diabetes has not significantly affected the outcome. All diabetic MI patients needed Insulin. All patients with Block did not require specific treatment. Clinical status is most important consideration. Pacemaker is like second marriage with its new set of trouble and might needed to be avoided unless indication is absolute.

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WORLD HEALTH DAY 2017 – MESSAGE

DEPRESSION: LET'S TALK

The World Health Day this year focuses on 'depression'.

Globally, around 350 million people of all ages, from all walks of life, suffer from depression. It causes mental anguish and impacts on people's ability to carry out even the simplest everyday tasks, with sometimes devastating consequences for relationships with family and friends. At its worst, depression can lead to suicide, now the second leading cause of death in 15-29-year olds.

Depression can be prevented and treated. A better understanding of what depression is, and how it can be prevented and treated, will help reduce the stigma associated with the condition, and lead to more people seeking help.

World Health Day is celebrated on 7 April to mark the founding of WHO.

Campaign at a glance

World Health Day, celebrated on 7 April every year to mark the anniversary of the founding of the World Health Organization, provides us with a unique opportunity to mobilize action around a specific health topic of concern to people all over the world.

The theme of our 2017 World Health Day campaign is depression.

Depression affects people of all ages, from all walks of life, in all countries. It causes mental anguish and impacts on people's ability to carry out even the simplest everyday tasks, with sometimes devastating consequences for relationships with family and friends and the ability to earn a living. At worst, depression can lead to suicide, now the second leading cause of death among 15-29-year olds.

Yet, depression can be prevented and treated. A better understanding of what depression is, and how it can be prevented and treated, will help reduce the stigma associated with the condition, and lead to more people seeking help.

This guide is for you

If you are reading this campaign guide, you are probably interested in getting involved in the campaign. That's great, because achieving campaign goals will only be possible if we work together.

Whether you work for the government, a nongovernmental organization or a media outlet, whether you are a doctor, teacher, journalist, blogger, parent or simply someone who has heard about the campaign and would like to get involved, this guide is for you.

What we are trying to achieve

The overall goal of this one-year campaign, beginning on 10 October 2016, World Mental Health Day, is that more people with depression, in all countries, seek *and get* help.

More specifically, we are aiming to achieve the following: the general public is better informed about depression, its causes and possible consequences, including suicide, and what help is or can be available for prevention and treatment; people with depression seek help; and family, friends and colleagues of people living with depression are able to provide support.

What is depression?

Depression is an illness characterized by persistent sadness and a loss of interest in activities that you normally enjoy, accompanied by an inability to carry out daily activities, for at least two weeks. In addition, people with depression normally have several of the following symptoms: a loss of energy; a change in appetite; sleeping more or less; anxiety; reduced concentration; indecisiveness; restlessness; feelings of worthlessness, guilt, or hopelessness; and thoughts of self-harm or suicide.

The campaign core

At the core of the campaign is the importance of talking about depression as a vital component of recovery. The stigma surrounding mental illness, including depression, remains a barrier to people seeking help throughout the world. Talking about depression, whether with a family member, friend or medical professional; in larger groups, for example in schools, the workplace and social settings; or in the public domain, in the news media, blogs or social media, helps break down this stigma, ultimately leading to more people seeking help.

The slogan

The campaign slogan is: Depression: let's talk.

Who we are targeting

Depression can affect anyone. So this campaign is for everyone, whatever your age, sex, or social status. At the World Health Organization, we have chosen to pay particular attention to three groups that are disproportionately affected: adolescents and young adults, women of childbearing age (particularly following childbirth), and older adults (over 60s). Materials targeting these audiences are available in the campaign materials.

Overarching messages

Depression is a common mental disorder that affects people of all ages, from all walks of life, in all countries.

The risk of becoming depressed is increased by poverty, unemployment, life events such as the death of a loved one or a relationship break-up, physical illness and problems caused by alcohol and drug use.

Depression causes mental anguish and can impact on people's ability to carry out even the simplest everyday tasks, with sometimes devastating consequences for relationships with family and friends.

Untreated depression can prevent people from working and participating in family and community life.

At worst, depression can lead to suicide.

Depression can be effectively prevented and treated. Treatment usually involves either a talking therapy or antidepressant medication or a combination of these.

Overcoming the stigma often associated with depression will lead to more people getting help.

Talking with people you trust can be a first step towards recovery from depression.

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Something that can happen to anybody.

Not a sign of weakness.

Treatable, with talking therapies or antidepressant medication or a combination of these.

What can be done for depression?

Talk to someone you trust about your feelings. Most people feel better after talking to someone who cares about them.

Seek professional help. Your local health-care worker or doctor is a good place to start.

Remember that with the right help, you can get better.

Keep up with activities that you used to enjoy when you were well.

Stay connected. Keep in contact with family and friends.

Exercise regularly, even if it's just a short walk.

Stick to regular eating and sleeping habits.

Accept that you might have depression and adjust your expectations. You may not be able to accomplish as much as you do usually.

Avoid or restrict alcohol intake and refrain from using illicit drugs; they can worsen depression.

If you feel suicidal, contact someone for help immediately.

Remember: Depression can be treated. If you think you have depression, seek help.

Worried that your child is depressed?

2016-2017

Growing up is full of challenge and opportunity—starting and changing school, making new friends, going through puberty and preparing for exams ... Some children take change in their stride. For others, adaptation is harder, causing stress and even depression. If you are worried that your child might be depressed, read on.

Depression is an illness characterized by persistent sadness and a loss of interest in activities that you normally enjoy, accompanied by an inability to carry out daily activities, for at least two weeks.

Additional signs and symptoms of depression during childhood include withdrawal from others, irritability, excessive crying, difficulty concentrating at school, a change in appetite or sleeping more or less.

Younger children may lose interest in play. Older children may take risks that they would not normally take.

Depression is both preventable and treatable.

Talk to him or her about things happening at home, at school and outside of school. Try to find out whether anything is bothering him or her.

Talk to people you trust who know your child.

Seek advice from your health-care provider.

Protect your child from excessive stress, maltreatment and violence.

Pay particular attention to your child's wellbeing during life changes such as starting a new school or puberty.

Encourage your child to get enough sleep, eat regularly, be physically active, and to do things that he or she enjoys.

Make time to spend with your child.

If your child has thoughts of harming him- or herself, or has already done so, seek help from a trained professional immediately.

Remember: If you think your child might be depressed, talk to him or her about any worries or concerns, and seek professional help if needed.

Worried about the future? Preventing depression during your teens and twenties

Adolescence and young adulthood present many opportunities – for meeting new people, visiting new places and finding a direction in life. These years can also be a time of stress. If you are feeling overwhelmed rather than excited by these challenges, read on

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Much can be done to prevent and treat depression.

Talk to someone you trust about your feelings.
Seek professional help. Your local health-care worker or doctor is a good place to start.
Stay connected. Keep in contact with family and friends.
Exercise regularly, even if it's just a short walk.
Stick to regular eating and sleeping habits.
Avoid or restrict alcohol intake and refrain from using illicit drugs; they can worsen depression.
Continue doing things you have always enjoyed, even when you don't feel like it.
Be aware of persistent negative thoughts and self-criticism and try to replace them with positive thoughts. Congratulate yourself on your achievements.
Remember: There is a lot that you can do to keep mentally strong. If you feel that you may be heading for depression, talk to someone you trust or seek professional help.

Staying positive and preventing depression as you get older

The life changes that come with ageing can lead to depression. To learn more about preventing and treating depression in older age, read on.

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Depression is common in older people but often overlooked and untreated.

Depression among older people is often associated with physical conditions, such as heart disease, high blood pressure, diabetes or chronic pain; difficult life events, such as losing a partner; and a reduced ability to do things that were possible when younger.

Older people are at a high risk of suicide.

Depression is treatable, with talking therapies or antidepressant medication or a combination of these.

Talk to someone you trust about your feelings.

If you think you are depressed, seek professional help. Your local health-care worker or doctor is a good place to start.

Keep up with activities that you have always enjoyed, or find alternatives if previous activities are no longer possible.

Stay connected. Keep in contact with family and friends.

Eat at regular intervals and get enough sleep.

Exercise regularly if you can, even if it's just a short walk.

Avoid or restrict alcohol intake and only take medicine as prescribed by your health-care provider.

Remember: There is a lot that can be done to prevent, and treat, depression in older age.

If you sometimes feel that life seems so hard that it is no longer worth living, read on.

The pain seems overwhelming and unbearable.

You feel hopeless, like there is no point in living.

You are consumed by negative and disturbing thoughts.

You cannot imagine any solution to your problems other than suicide.

You imagine death as a relief.

You think everyone would be better off without you.

You feel worthless.

You feel very lonely even when you have friends and family.

You do not understand why you are feeling or thinking this way.

You are not alone. Many other people have gone through what you are going through and are alive today.

It is okay to talk about suicide. It can help you feel better.

Having an episode of self-harm or suicidal thoughts or plans is a sign of severe emotional distress (perhaps as a result of the loss of a loved one, loss of employment, a relationship break-up, or experience of violence or abuse). You are not to blame and it can happen to anyone.

You can get better.

There are people who can help you

Talk to a trusted family member, friend, or colleague about how you feel.

If you think you are in immediate danger of harming yourself contact the emergency services or a crisis line, or go there directly.

Talk to a professional, such as a doctor, mental health professional, counsellor or social worker.

If you practice a religion, talk to someone from your religious community who you trust.

Join a self-help or support group for people with lived experience of self-harm. You can help each other to feel better.

Remember: If you feel like life is not worth living, reach out for help. You are not alone. Help is available.

Source: WHO website www.who.int