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Editorials
Problems in bio medical scientific publishing
Editor Dr janardan V Bhatt

There have been some meetings of Indian medical journal editors to address issues of quality, standard, global outreach and other concerns. The 2nd National Assembly of Medical

Editors organized by the Journal of Indian Medical Association [JIMA] late last year. The editors debated the ills plaguing Indian medical journals.

Major problems encountered by Indian medical journal editors and publishers are to enumerate few

Not on time: Journals are not published in schedule time. And some one full volume publication is missing. Significant numbers of journals have their on off type phenomenon i.e. publication start and stop than again start and so on. Financial factor may be the main factor responsible.

Poor accessibility & coverage: If the journal is publishing with such irregularity, how reader will trust the journal. In the absence of internet coverage, it is virtually very difficult to let others know about the journal. And this is the most important and common problem of medical journals especially new journal related to basic medical sciences. Only editors know what is **postal cost**. I was shocked when one editor of USA based journal quoted the seriousness of postal cost related issue. It is very difficult to get people of basic sciences to get know that such journal is being published unless it online or internet. Though day by day people using internet is increasing but still significant mass remain who is not use internet.

Still another problem faced by editors are simultaneous **duplicate submission** of article by the authors in two journal at the same time and shocking both are published and put the editors in bad situation. And there is hardly any punishment for such acts.

Some time the article is **written poorly** in technical term and the editorials are forced to publish such an article as early as possible.

Even upon large number of workshops on biomedical **statistics** are arranged medical teaching institutes including inclusion of bio statistics in medical education, the level of knowledge remained limited and that is reflected in scientific articles and conclusions also. Some times the statistics is such a grossly manipulated that the heart of article is seriously damaged.

Problem of authorship is even more complicated that one can imagine including ghost authorship. The head of department, institute or organization is included amongst the authors to increase the power of the article and actually their contribution article might be nil. Some time the editors are working under such head and then the editor is in very bad situation ethical point of view if the quality of article is poor. And incidentally the real author name is missing and only found when such claim are come forward to editors.

Even the **authenticity, bias in sample selection, lack of novelty, contributor ship, Study design, Conflicts of interest (COI)** are some more complex issues where more innovative are required to sort out the issues.

Certain issues like Industry sponsored research/Financial COI including **clinical trials** are required more legislative actions such issues always in discussion. More systemic ethical standards and codes of conducts are required to sort out the issue. **Animal ethics** related issues even more complicated and regular update of knowledge is required.

It has been argued that substantial number of Indian journals are unavailable to global researchers, and have no impact factor (IF) continue to be of concern to policy makers, researchers and journal editors.

The reason being, Non-inclusion of these journals in the global databases means that even good research reported in these journals remains largely unknown to the world. But if the journal is on net mean even article in or whole journal is available on internet, there no reason to think that the article has no impact. About 600 or more biomedical journals/periodicals are published from India with some serious science content, mostly by learned societies. One parameter on the quality of journal is inclusion in the global indexing like the PubMed, Science Citation Index, Excerpta Medica, EMBASE of Elsevier and the number of Indian journals in such data is substantially very low. But does this means that we should remain in standstill and do not do anything. We learn by experience. And by that way only we can reach the target. Journey of millions of kilometers begins with one step/one feet only.

Ref: Indian J Med Res 132, August 2010, pp 119-122
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at the 2nd National Assembly of Medical Editors, November 29, 2009, Kolkata.
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Papers:

2]

A COMPARATIVE STUDY OF DIFFERENT TASTE PARAMETERS IN DIABETICS AND NON- DIABETICS.

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Abstract

The present study included 65 diabetic subjects from the diabetic Clinic of J.J. Hospital, Byculla, Mumbai and 30 control subjects and from the normal healthy teaching and non-teaching faculty members of grant medical college. The objective of this study was aimed at comparing tasting ability in diabetics and non- diabetics for taste parameters like sweet, sour, salty, bitter & Phenylthiocarbamide(PTC). On comparison it was revealed that there was significant lowered tasting ability of the diabetic subjects ($p < 0.05$) for sweet, salt, sour & bitter solutions as compared with the controls. Highly significant results were observed for sweet taste ($p < 0.001$). But no significant difference in PTC tasting ability ($p > 0.05$) was observed between the two groups. Diabetes thus seems to affect the tasting ability of individuals for sweet, sour, salty & bitter tastes but PTC tasting ability seems to remain unchanged.

Key words

Taste parameters	sweet	salty
Phenylthiocarbamide	sour	bitter

* corresponding author

Introduction

Diabetes mellitus is a major disease affecting people worldwide. It is a disease characterized by chronic hyperglycemia & disturbance of carbohydrate, fat & protein metabolism associated with absolute or relative deficiencies of insulin secretion and/or insulin action. (1)

Many diseased states like thyroid disorders, zinc & sodium deficiency, diabetes, and conditions like pregnancy (2) are known to alter the taste sensation in humans. Taste dysfunction

is a disturbing problem to many individuals as it can affect the health of the individual by altering the food preferences and food habits of the person.

Studies have been done on the alteration of the taste sensation in different disorders. Such information may be useful for the evaluation of patients with taste disorders.

Taste *per se* is mainly the function of the taste buds of our tongue, but grossly it is a combination of the sensations of taste, as well as the smell, odour & even the texture of food.

Taste sensation and the appetite for certain types of food are often driven by an uncanny mechanism whereby a deficiency of a certain type of ingredient in the body could drive or motivate certain animals to crave for food rich in those type of ingredients.

An interesting aspect of taste is about a certain compound Phenylthiocarbamide (PTC) also known as N-phenylthiourea which tastes bitter to some people and not so to others.

The objective of the present study is aimed at studying the effect of different taste modalities like sweet, sour, salty, bitter and PTC tasting ability on the diabetic patients.

Materials and Methods

The study was carried out at the Dept. of Physiology, Grant Medical College and the Diabetic OPD of J.J. Hospital.

The subjects were selected after a detailed history taking and ruling out factors that could alter the taste sensations like 1) Coryza or Influenza

2) Sjorens' syndrome 3) Radiotherapy around oral area 4) Vit. A, B₁₂ and Zinc deficiencies 5) Cushing's syndrome, Hypothyroidism 6) Amitryptiline and other cytotoxic drugs 7) Bells Palsy 8) Depressive, psychotic illnesses and 9) Epilepsy. (3, 4)

After taking the above precautions, subjects were selected in the following order:

Thirty control subjects were chosen randomly from the healthy teaching staff and non-teaching staff of Grant Medical College after checking their Fasting and Post-prandial Blood sugar levels to be normal.

Sixty-five diabetic patients were chosen from the Diabetic OPD of J.J. Hospital after matching their age groups with those of the controls.

Co-existent diseases like Hypertension and Cardiac disease were looked for and ruled out. Before starting the tests the following precautions were taken:

1) The subjects were asked not to smoke, eat or drink anything except water at least for one hour before the threshold measurement. (5-12)

2) The tests were carried out in the morning time between 9 am to 11 am. (5-12)

A common basis for all tests was as follows. (13,14)

The taste sensitivity for each solution was carried out as per Harris & Kalmus method assisted by a forced choice and up down tracking procedure for better output & results. Serial half dilutions for each taste type were made using de-ionized distilled water. Subjects were given the solutions of lowest concentration to taste first & then tasted successive higher solutions until a definite taste was identified. The test tube corresponding to the concentration was noted and then ascertained by using the up down tracking method which was done by testing the subject with the upper and lower concentrations as well to ascertain the genuineness of the subjects answer. Distilled water was used in between to rinse the tongue. The actual threshold concentration was determined & the test tube number noted.

The Substances used for different taste modalities were:

Sweet taste: Glucose with molecular weight 180.1

Salty Taste: Sodium chloride with molecular weight 58.44

Sour Taste: Citric acid Monohydrate with molecular weight 210.1

Bitter Taste: Quinine Sulphate with molecular weight 746.9

Table: 1 Molar concentrations of different taste substances in different test tubes

Test tube number (Each taste modality had seven different test tubes)	Glucose Conc. in Moles (Sweet)	Sodium chloride Conc. in Moles (Salty)	Citric acid Monohydrate Conc. in Moles (Sour)	Quinine Sulphate Conc. in Moles (Bitter)
1	2.0 M	1.0 M	0.05 M	0.001 M
2	1.0 M	0.50 M	0.025 M	0.0005 M
3	0.5 M	0.25 M	0.012 M	0.00025 M
4	0.25 M	0.125 M	0.006 M	0.000125 M
5	0.125 M	0.0625 M	0.003 M	0.000062 M
6	0.0625 M	0.03125 M	0.0015 M	0.000031 M
7	0.03125 M	0.0156 M	0.0007 M	0.000015 M

For PTC Screening the substance used was Phenylthiocarbamide with molecular weight 152.2. In this procedure 13 serial half dilutions were made and the concentration at which a definite Bitter taste was felt was noted. Further they were classified as tasters if the subjects were able to perceive bitter taste in solutions between test tube numbers 5-13 & Non tasters if they were able to perceive Bitter taste in solutions between test tube numbers 1-4.

Table: 2 Percentage concentrations of Phenylthiocarbamide in thirteen different test tubes

Test Tube No.	Conc. In Percentage (mgs/dl)
1	0.13 %
2	0.065 %
3	0.0325 %
4	0.016 %
5	0.008 %
6	0.004 %
7	0.002 %
8	0.001 %
9	0.0005 %
10	0.00025 %
11	0.0001 %
12	0.00005 %
13	0.00003 %

All the solutions for sweet, salt, sour, bitter & PTC were made by weighing the agents on Donnas model of Electronic & Refractive Mono Pan Balance Scale for accuracy of results.

The observations of various taste parameters i.e. sweet, salt, sour, bitter & PTC tasting ability in diabetics & Non-diabetics were noted with reference to the test tube numbers indicating the threshold concentration of substances at which taste was perceived.

Statistical analysis

The statistical analysis of the data collected for the study was done with the help of the computer software package SPSS (Statistical package for social sciences.) Two tests were employed for the analysis and results.

1) Mann-Whitney Test

This is a non-parametric test used to compare two unpaired groups. This test was used to compare the thresholds of different taste parameters.

2) Chi-Square test

This is used to find out the significance in smaller groups. This test was used to compare the tasting capability of PTC between diabetics & Non-diabetics.

Observation and Results

The observations of various taste parameters i.e. sweet, salt, sour, bitter & PTC tasting ability in diabetics & Non-diabetics were noted with reference to the test tube numbers indicating the threshold concentration of substances at which taste was perceived.

Table: 3 Observations for different taste sensations in diabetics and controls showing the number of subjects having taste thresholds at specific test tubes.

Sensation felt to Test tube no.	Sweet		Salty		Sour		Bitter	
	Diabetics /65	Control /30	Diabetics /65	Control /30	Diabetics /65	Control /30	Diabetics /65	Control /30
1	-	-	-	-	-	-	10	1
2	-	-	1	-	1	-	35	3
3	10	-	9	-	17	-	15	5
4	46	8	12	2	8	6	5	15
5	8	16	41	17	38	18	-	5
6	1	6	1	10	1	6	-	1
7	-	-	1	1	-	-	-	-
Significance	p<0.001		p<0.05		p<0.05		p<0.05	

Statistical analysis was done using Mann-Whitney Test

This test gave the following results.

For sweet taste p value was less than 0.001(p<0.001) which showed that the result was highly significant.

For salty, sour and bitter taste p value was less than 0.05(p<0.05) which showed that the result was significant.

This showed that the diabetics had decreased taste sensitivity for all taste parameters i.e. sweet, salt, sour & bitter.

Table:4 Results for PTC tasting capability in diabetics and controls

Group	Diabetics/65	Control/30
Tasters	38	22
Non-tasters	27	8

$$X^2 = 1.951 \quad df = 1 \quad p = 0.162$$

Statistical analysis was done using Chi-Square test

This test gave the p value greater than 0.05. (p>0.05).

The result was thus not significant.

This showed that Diabetics did not differ in their tasting ability for PTC as compared to non-diabetics.

Discussion

The study conducted was mainly aimed at comparing the taste thresholds of diabetics and non-diabetics. Diabetics have significantly accelerated levels of oxidative stress and this almost accounts for most diabetic complications, i.e. Neuropathic, cardiovascular, retinal, renal, etc. Some authors have shown that diabetes mellitus is a free radical mediated disease. (15,16)

Pathological changes in the peripheral nerves in diabetes appear much earlier than the outset of clinical symptoms of neuropathy and the myelin is affected more severely than the axis cylinder. This could be due to a metabolic abnormality inherent in the diabetic state.

The other school of thought specifically points towards a significant & specific impairment in glucose taste detection. (17) It is said that in diabetes a taste abnormality for sugar might conceivably be due to frequent elevations of the blood sugar levels, i.e. a "Satiation effect". Thereby, the decreased taste sensitivity to glucose may result in an increased preference for glucose because more of the sugar would have to be ingested in order to produce the same taste sensation. (18,19)

Le Floch et al, (20) had mentioned about the deterioration of all four primary taste modalities in 1989. Similarly Hardy SL et al study in 1981 revealed a decrease of the diabetic individual's ability to detect & recognize sweet, salty & bitter solution. Special reference to deterioration in sweet taste sensations was made by Macfarlane et al in 1996 and also by Halter J et al in 1975. These findings were consistent with the present study.

Though all other taste modalities like sweet, salt, sour, bitter, were affected in diabetics but PTC tasting ability did not show any specific preponderance in either diabetics or non-diabetics. These findings were consistent with the original work done by Harris and Kalmus (1949) on PTC tasters and non-tasters. (9)

PTC non-tasting is a Medelian recessive characteristic according to studies made by Blackslee and Salman (1931). (21-23) Studies done by Rao et al (24) show a definite Geographic, ethnic and racial preponderance of PTC tasters / non-tasters amongst the general population.

Limitations of the present study include being done in a limited geographic area of population distribution, which could have probably affected the result and outcome of the Phenylthiocarbamide tasting ability.

The present study thereby revealed that diabetes affected the tasting ability of individuals for sweet, salt, sour and bitter tastes but PTC tasting ability remained unchanged.

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SWEET THRESHOLD IN DIABETICS & NON-DIABETICS

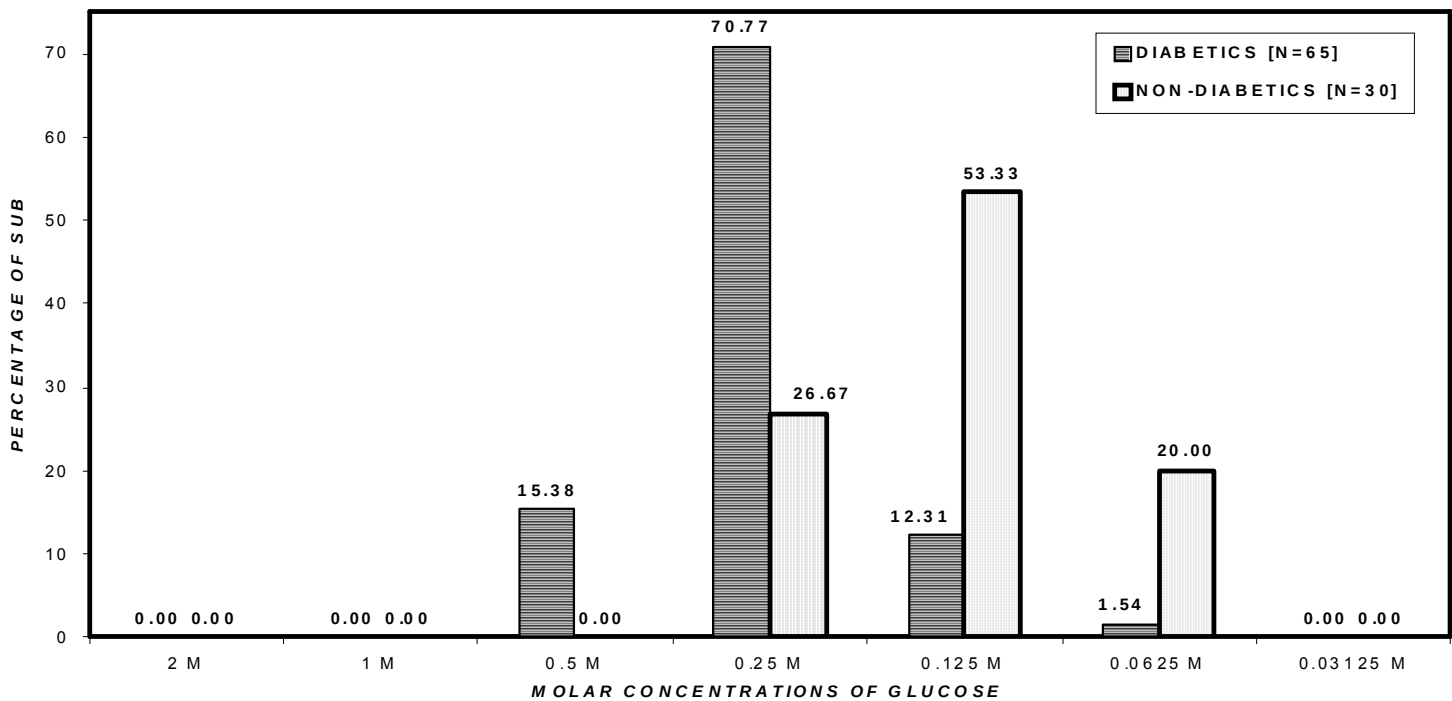


Figure-1 showing sweet threshold in Diabetics & Non-Diabetics

SALT THRESHOLD IN DIABETICS & NON-DIABETICS

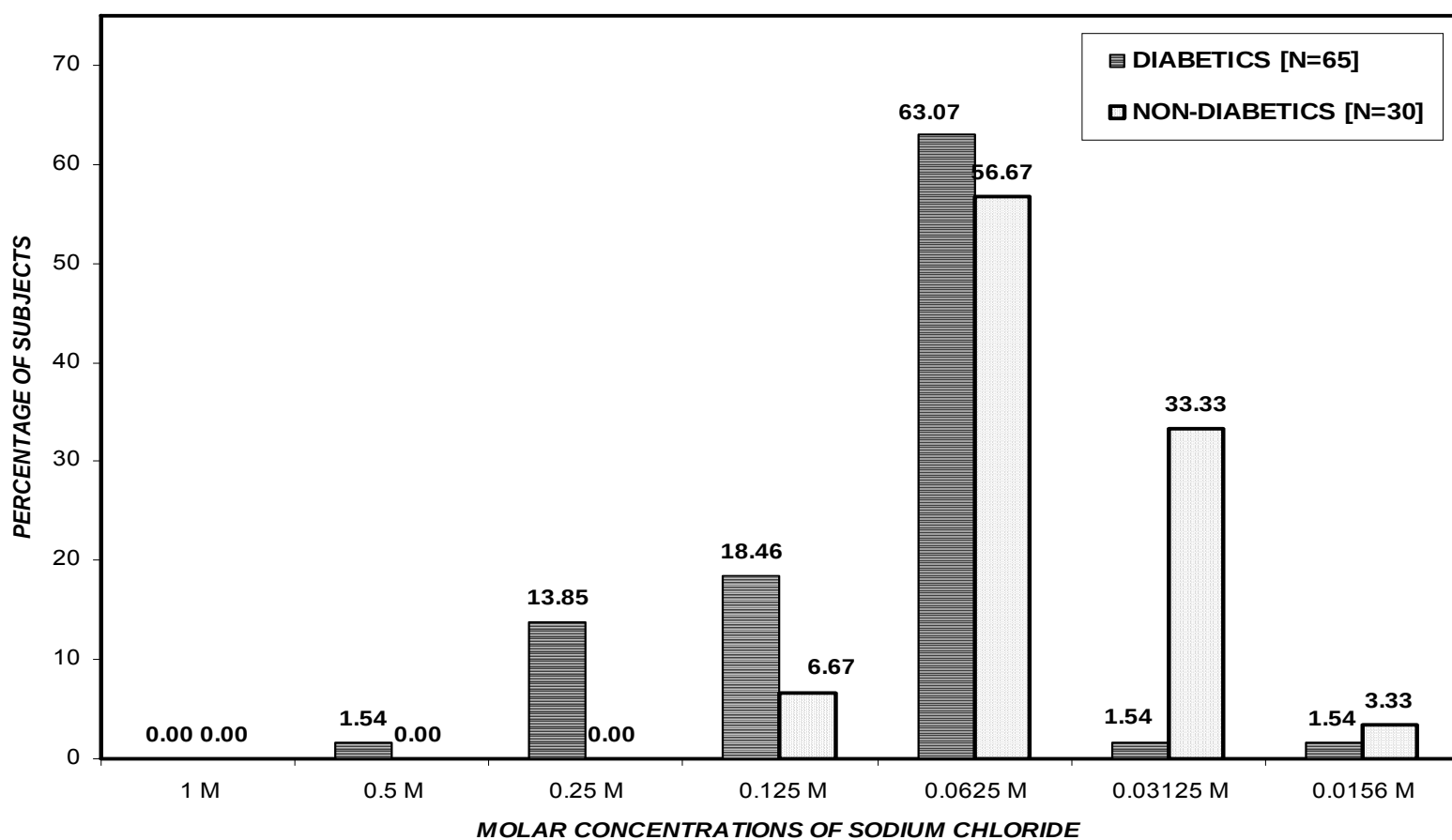


Figure-2 showing salt threshold in Diabetics & Non-Diabetics

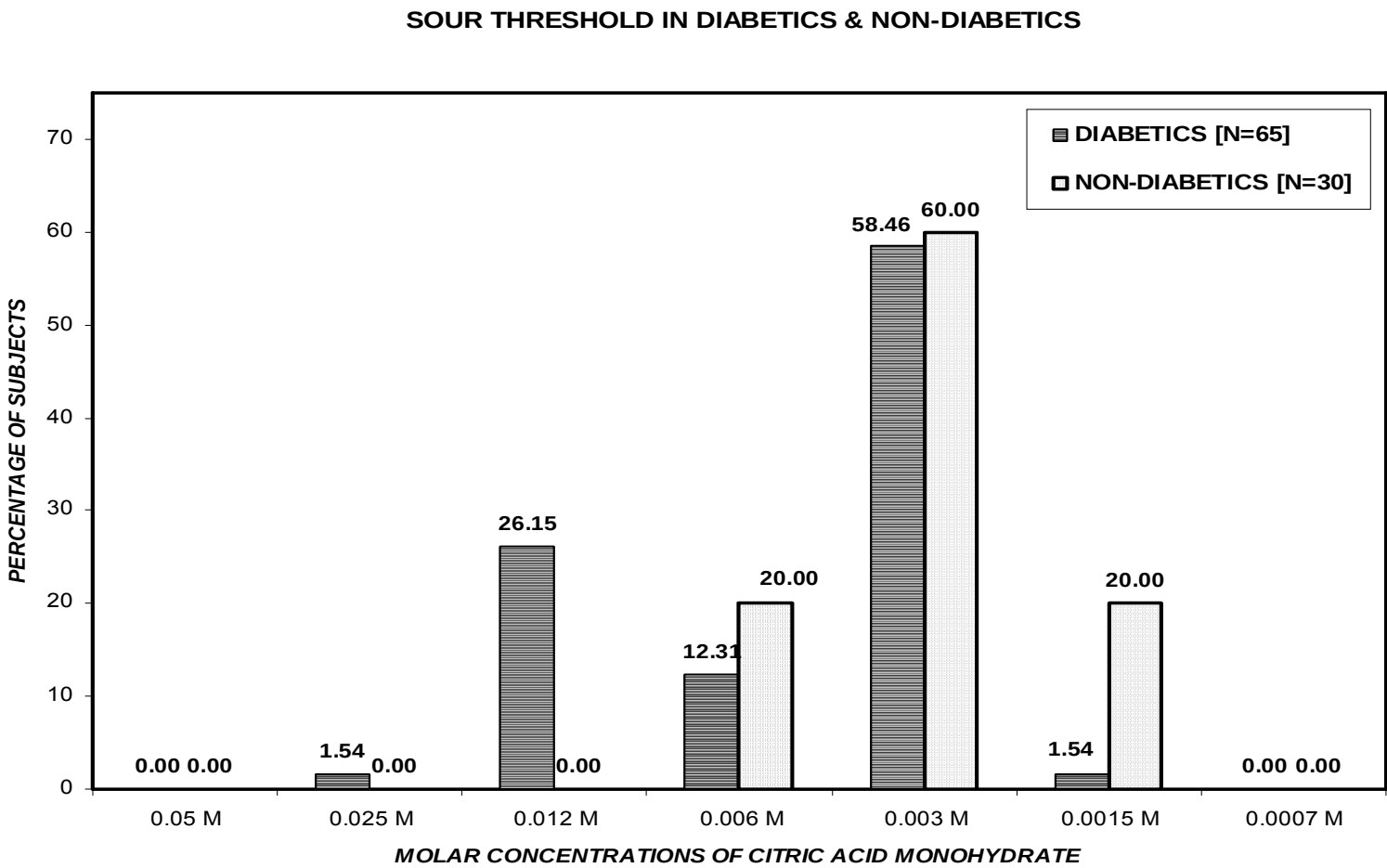


Figure-3 showing sour threshold in Diabetics & Non-Diabetics

BITTER THRESHOLD IN DIABETICS & NON-DIABETICS

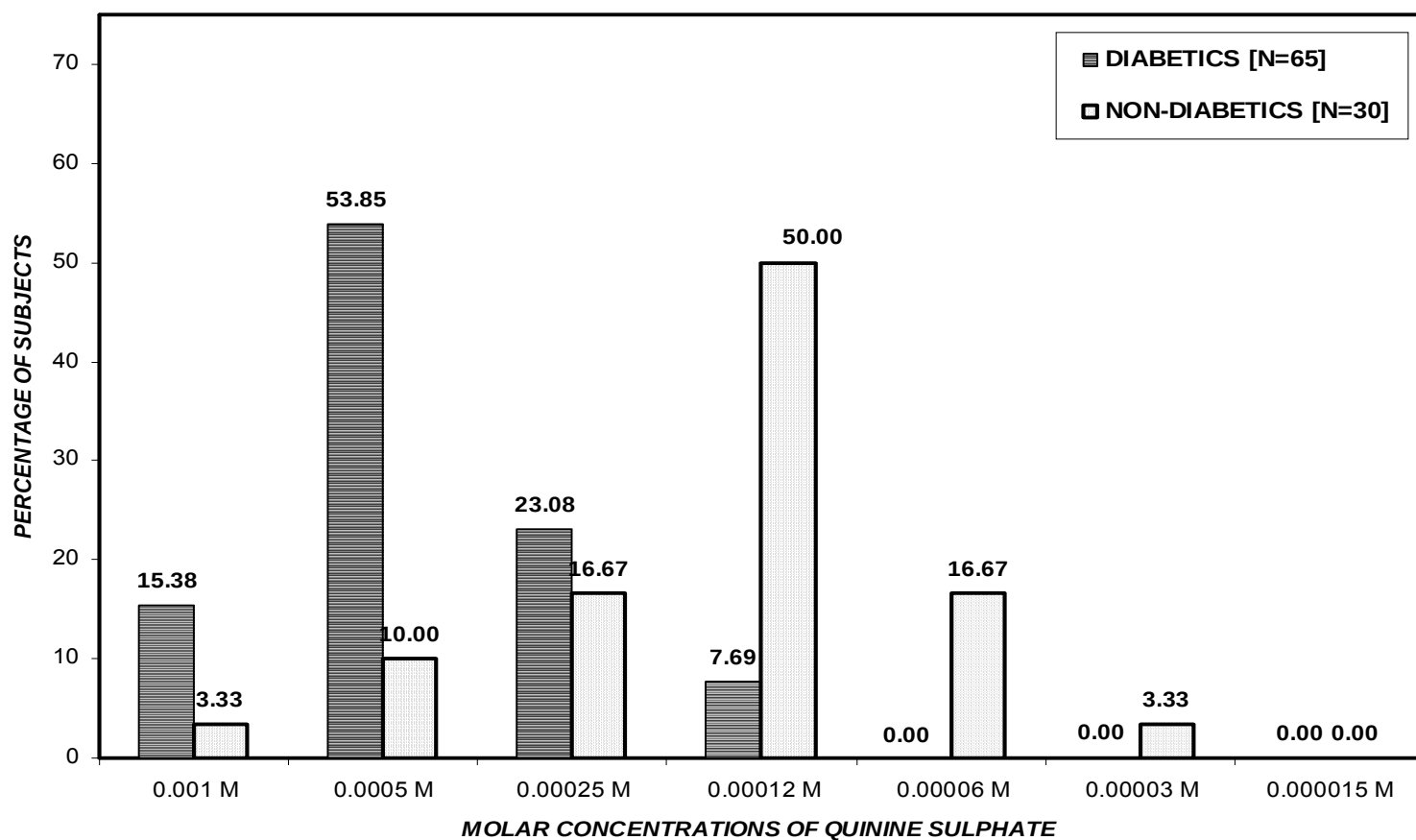


Figure-4 showing bitter threshold in Diabetics & Non-Diabetics

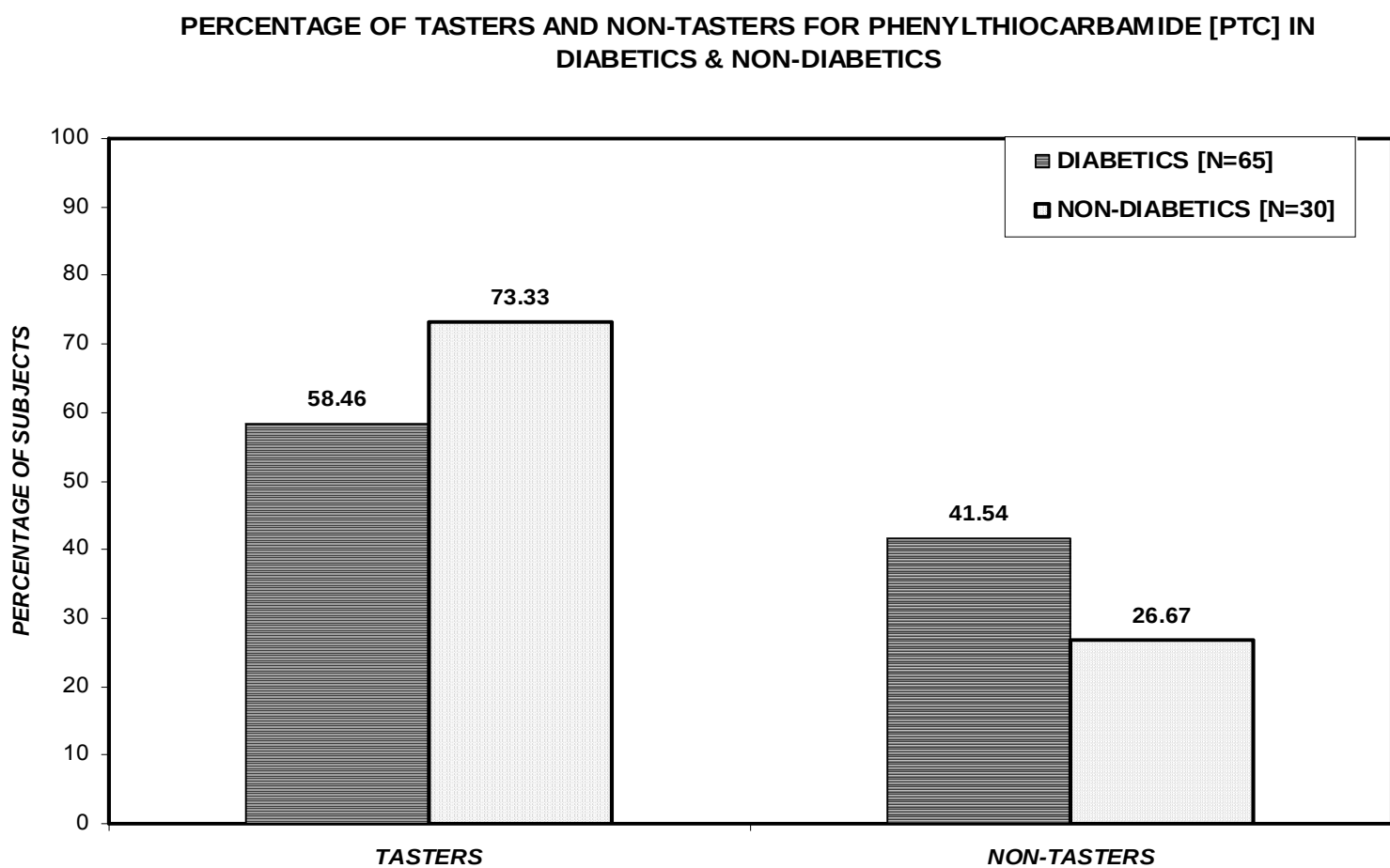


Figure showing percentage of tasters and non-tasters
for PTC in Diabetics and Non-Diabetics

3]

GENDER VARIATION IN CARDIOVASCULAR RESPONSE TO ISOMETRIC EXERCISES OF UPPER LIMBS

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The Study analyzes the difference in the cardiovascular response to isometric upper limb exercises between healthy young males and females.

Abstract:

The study was conducted on young volunteers, 15 males and 15 females, of mean age 20±1 years to study the gender variation in cardiovascular response to isometric exercises. The baseline cardiovascular parameters (HR, SBP, DBP, MAP and RPP) were measured before the

exercise. After two sets of three static upper limb exercises for 3 minutes, the parameters were recorded at the end of the exercise and 3 minutes into recovery. An increase in HR, SBP and RPP was seen in both the groups after exercise. This increase was more pronounced in males ($p < 0.05$) than females. DBP and MAP decreased in both the groups, but females showed a greater fall. The RPP showed a significant increase ($p < 0.05$) in males as compared to females. This indicates that the males have higher myocardial oxygen demand during isometric exercise, predisposing them to greater risk of ischemia, if they develop any cardiovascular risk factor compromising the coronary blood flow.

Key words:- rate pressure product, isometric hand grip exercise

INTRODUCTION

Exercise is a form of self induced stress leading to circulatory and respiratory adjustments in the body to the resultant increased metabolic demand. These changes depend upon the specific types of exercises undertaken, isometric or isotonic. Isometric or static exercises are characterized by change in the muscle tension with no change in the length whereas isotonic or dynamic exercises exhibit change in the muscle length with tension remaining the same. Most of the muscular activities are a combination of both isometric and isotonic contractions. The isometric contractions are seen in various exercises like pushing or lifting heavy loads, where net displacement of load is not present, but the rising tension can be felt in the contracting muscles. On the other hand, isotonic contractions are seen in the activities like running, cycling, swimming etc., where change of length can be appreciated but no change of muscle tension is appreciated.

The metabolic demands of the exercising muscle increases, depending upon the intensity of the exercise and these are met with various changes in the circulatory and respiratory system. The sympathetic system plays a key role in these changes resulting in increased heart rate,

systolic and diastolic blood pressure and an increased respiratory rate during the exercise. The raised systolic blood pressure is because of increased cardiac output and the raised diastolic blood pressure is due to increased peripheral resistance (1) during the exercise. All these circulatory changes result in an increased muscle blood flow to meet the demands of the muscle. In isotonic exercise, the large muscle groups contract and relax rhythmically which allows adequate blood flow to the muscle with increased SBP while in isometric exercises, the small groups of muscles remain in the contracted state throughout the exercise resulting in the compression of the blood vessels and occlusion of blood flow to active muscle. Thus it has been observed in that there is a difference in circulatory response to isometric exercises as compared to isotonic exercises.

The present study analyzes the changes in the cardiovascular parameters in the body that arise as a result of static or isometric exercises. There have been reported gender difference in the cardiovascular response to exercise; and this study further analyzes the differences seen in this response amongst the young male and female subjects, when subjected to isometric exercises of the upper limbs.

MATERIAL AND METHODS

The study was conducted on 30 young healthy volunteers divided into two groups. One group comprised of 15 healthy male volunteers and other group comprised of 15 healthy female volunteers. The detailed history of the subjects was obtained and recorded to confirm the absence of any systemic affliction. The informed consent, in writing, was obtained from the subjects.

The baseline heart rate (HR), systolic and diastolic blood pressure (SBP, DBP) was recorded. The subjects with blood pressure more than 140 /90 were not included in the study. A fully automated bed side monitor (Larson and Tubro) was used to measure the heart rate and blood pressures (systolic, diastolic and mean arterial pressure (MAP)). These parameters were recorded in upright posture. Pre exercise HR, SBP, DBP and MAP were measured. The subject

was then instructed to perform two sets of three different isometric exercises (2). The duration of each exercise was 30 seconds and hence, that of the whole set of 3 exercises was 90 seconds. Since two such sets were done in continuation, the total exercise duration was 3 minutes. The subject was instructed to follow the strict exercise protocol of pushing the wall, in upright posture, with both the arms extended for 30 seconds followed by clasping the hands in front of the sternum, with both the arms abducted resulting in winging of scapula for another 30 seconds. The hands were pushed against one another so that the raised tension was felt in the upper limbs. The third exercise was the hand grip exercise using hand grip dynamometer, on which sub maximal contraction was maintained at 70% of maximal voluntary contraction (MVC) for 30 seconds. All these exercises were then repeated to complete 2 sets of each exercise. All the cardiovascular parameters were recorded immediately at the end of the exercise and then into recovery period i.e. after one minute, two minutes and three minutes of completion of exercise.

The data comprising of HR, SBP, DBP, MAP and RPP was recorded and RPP was calculated (3, 4) from SBP and HR using the formula,

$$RPP = HR \times SBP \text{ (beats per minute} \times \text{mm of Hg)}$$

The statistical analysis of data was done using ANOVA. The data was compared with the respective base line parameter for analyzing the effect of exercise within the same group. Also it was compared amongst the groups to find out the difference in response to exercise at the same interval of time. P value < 0.05 was considered as significant.

OBSERVATION AND RESULT

The mean age group (20 ± 1 years) of both the groups was same with mean BMI of males being $21 \pm 3 \text{ kg/m}^2$ and that of females being $22 \pm 2 \text{ kg/m}^2$. Females had slightly higher BMI than males.

Table I

The various parameters (HR, SBP, DBP, MAP, and RPP) observed before the exercise, at the termination and recovery up to 3 minutes after the exercise, in males and females, are shown in the tables II and III respectively. The pre exercise parameters of both the groups were comparable and the differences in both the groups were not significant.

Table II + Table III

Immediately at the end of exercise, similar changes were observed in both the groups but the response was slightly attenuated in the females. The HR increased significantly ($p<0.05$) in both the groups from the pre exercise levels, showing an increase of 15.8% in males and 11.9% in females. This increase in the heart rate was significantly higher ($p<0.05$) in the males as compared to the females. During recovery the heart rate remained elevated as compared to the baseline levels in both the groups.

The SBP was increased by 9.1% in males and 4.8% in females. Though the increase in SBP was significant ($p<0.05$) in both the groups individually as compared to their respective pre exercise levels, it was significantly ($p<0.05$) more in the males as compared to the females. The SBP recovered earlier in the females as compared to the males, in whom the SBP remained elevated for a longer period than the pre exercise levels.

The DBP decreased in both the groups after the exercise. The decrease was not significant in either of the groups immediately after exercise cessation but DBP continued to fall and this fall became significant ($p<0.05$) during the recovery period at 1 minute after cessation of the exercise, in both males and females.

The MAP decreased in females and increased in males immediately at the end of the exercise, but these changes were not significant in any of the groups. The MAP decreased below the pre exercise levels in both the groups at 1 minute after cessation of the exercise, significantly ($p<0.05$) in females and not significantly in males, although the difference between males and females was not significant.

RPP increased by 27% in males as compared to 17.3% in females. This increase was significant ($p<0.05$) when compared to their respective pre exercise levels in both the groups and was significantly higher ($p<0.05$) in males when compared to females.

DISCUSSION

In the present study, we compared the effect of isometric upper limb exercises on cardiovascular parameters in young males and females who had no prior endurance training. The

males have more muscle mass (5, 6) as they have higher day to day activity than females. The body mass index (BMI) in females ($22 \pm 2 \text{ kg/m}^2$) was slightly higher than their male ($21 \pm 3 \text{ kg/m}^2$) counterparts and this could be attributed to the higher adiposity in the females.

The isometric exercises involve small groups of skeletal muscles as compared to the isotonic exercises in which larger muscle groups are involved. The tissues working hard, during an exercise and also after completion of exercise, require more oxygen than normal to pay off this oxygen debt incurred during exercise. This results in increased blood supply to the active muscles. To supply this extra amount of blood to the muscles, the heart works more, under the influence of sympathetic activation. The isometric exercises does not increase the oxygen demand to the extent raised by the isotonic exercise, thus the systolic blood pressure does not rise much in the isometric exercises. Hence isotonic exercises result in volume load on the heart while the isometric exercises result in pressure overload on the heart (7). The diastolic blood pressure, in contrast to the isotonic exercises, decreases after isometric exercises due to accumulation of local metabolites and resultant vasodilatation. The myocardial oxygen consumption (MVO_2) also increases due to exercise which is reflected by increased RPP after exercise.

The baseline parameters like HR, SBP, DBP, MAP and RPP were comparable in both the groups. The three minute isometric upper limb exercise increased the systolic blood pressure, heart rate and rate pressure product in both the groups whereas a fall was seen in the diastolic blood pressure and mean arterial pressure. These changes in the hemodynamic parameters were more pronounced in males as compared to females (8). The increased HR and SBP can be attributed to the sympathetic activation before and during the exercise. The males indicate better pressor response than the females; hence the greater increase in HR and SBP seen in males than females. Various researchers also observed greater SBP and catecholamine response to acute stress, showing a precedence of greater cardiovascular reactivity of stressors in men (9).

The static exercises obliterate the blood vessels in the active exercising muscle, raising the total peripheral resistance (TPR), thus increasing the pressure load or the after load on the

heart. The decreased blood supply to the exercising muscle results in the accumulation of the local metabolites and the nutrient depletion. When the exercise is terminated, the local factors results in vasodilatation and hence a post exercise fall is seen in the DBP. The fall in the DBP lowers the MAP in both the groups. It is documented that the males have higher plasma levels of all three catecholamines out of which plasma levels of epinephrine are higher, as compared to the females (9). This could have increased the MAP in the males immediately at the end of exercise whereas a fall was documented in females. The greater fall in DBP in females as compared to the males could also be attributed to the lower catecholamine levels.

Rate pressure product (RPP) is a major determinant of myocardial oxygen consumption hence is an important indicator of ventricular function. RPP varies with exercise such that the higher the peak RPP, the more will be myocardial oxygen consumption (MVO_2). The ability to reach higher RPP is associated with adequate coronary perfusion. The increased SBP and HR with exercise adjust myocardial supply with increased demand of the actively working cardiac muscle. The increase in HR and SBP increases the double product or rate pressure product. The RPP is increased more significantly in the males (15528 ± 3387 mm Hg beats per minute) than in the females (13407 ± 1692.2 mm Hg beats per minute). This increase is due to the volume overload and better pressor response of the males (3, 4). In this study, the RPP is increased by 27% in males whereas by 17.3% in females, immediately at the termination of exercise. This peak RPP reflects the better coronary perfusion of males than females to meet the increased myocardial oxygen demand during the isometric exercise and also through the 3 minute recovery.

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TABLE I showing mean age and BMI of both groups

	Age (years)	BMI (kg/m ²)
Males (n =15)	20± 1	21± 3
Females (n =15)	20± 1	22± 2

n is the number of subjects in each group ; All the values are mean ± SD

TABLE II showing the pre exercise and post exercise parameters in males; (n=15)

	Pre Exercise	Post Exercise			
		Immediately	1 min.	2 min	3 min
HR	100.5 ±14.8	116.4 ± 17.3* #	108.2 ± 15.3*	106 ± 13.9*	104.3 ± 11.7
SBP	121.9 ± 8.6	132.9 ± 16.1*	126 ± 11.8	126.1 ± 12.6	124 ± 9.1
DBP	82.2 ± 4.4	81.6 ± 8.2	79.5 ± 4.9*	80.47 ± 5.6	79.13 ± 6.3
MAP	96.5 ± 5.9	98.6 ± 8.7	94.4 ± 5.8	95.7 ± 7.1	94 ± 6.4
RPP	12222.8 ± 1867.8	15528 ± 3387* #	13596.5 ± 2029.2* #	13339.9* ± 2032.5	12913.9 ± 1646.6

All the values are mean ± SD

* significance p < 0.05 within the group, compared to the pre exercise levels

significance of $p < 0.05$ in between the two groups

TABLE III showing the pre exercise and post exercise parameters in females (n =15)

	Pre Exercise	Post Exercise			
		Immediately	1 min.	2 min	3 min
HR	93.4 $\pm$ 6.7	104.6 $\pm$ 12.3*	100.7 $\pm$ 11.6*	100.8 $\pm$ 11.5*	101.3 $\pm$ 10.5*
SBP	122.3 $\pm$ 6.5	128.2 $\pm$ 7.4*	124.9 $\pm$ 7.4*	121.1 $\pm$ 6.5*	119.3 $\pm$ 6.3*
DBP	85.4 $\pm$ 5.2	82.3 $\pm$ 7.1	81.4 $\pm$ 5.8*	81.87 $\pm$ 4.7*	81.33 $\pm$ 5.3*
MAP	98.9 $\pm$ 5.3	95.7 $\pm$ 5.7	94.5 $\pm$ 5.1*	94.4 $\pm$ 4.1*	93.8 $\pm$ 5.1*
RPP	11429 $\pm$ 98..8	13407 $\pm$ 1692.2*	12211.2 $\pm$ 1690.8*	12194.1 $\pm$ 1469.8*	12083.8 $\pm$ 1437.7

All the values are mean $\pm$ SD

* significance $p < 0.05$ within the group compared to the pre exercise

levels

4]

CORRELATION OF HYPERHOMOCYSTEINEMIA AND NEURAL TUBE DEFECT : A HOSPITAL BASED PILOT STUDY

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Hyperhomocystenemia has been found a clearcut association and significant factor for various adult vascular abnormalities. (1) But very little known in Indian studies about it effects on the anatomical development of embryonic resulting into neural tube defect. Various conflicting reports have been reported. It has been reported in some western literature that Hyperhomocystenemia is prevalent in 1:70 in general population. (2) But in our country there is no systematic epidemiological study hence there is no significant data available. Considering the high incidence of birth defects in new born and huge number of pregnant women will expose their to be born children to the consequence of elevated level of homocysteine. Considering he above facts we have conducted a pilot study in our hospital to find out the impact of high homocysteine level on

the anatomical development of embryonic tissues resulting into neural tube defect. Alterations in maternal folate and homocysteine metabolism are associated with neural tube defects (NTDs). But the role that specific micronutrients and metabolites play in the causal pathway leading to NTDs is not fully understood.

Our hospital where approximately 25 deliveries take in a day. We measured in a hospital -based sample of women who had NTD-affected pregnancies (n = 4) and a control group of women who had a pregnancy unaffected by a birth defect (n = 16). Plasma concentrations of folate, Vitamin B12, homocysteine, were compared between cases and controls after adjusting for lifestyle and sociodemographic factors. The level of folate, Vitamin B12, homocysteine by Abbot AxSYM immunochemistry analyser by fluorescent polarization technique. Fasting blood samples were collected into EDTA-Vacutainer tubes and immediately chilled on ice before centrifuging at 4000 × g for 10 minutes at 4°C to obtain blood plasma. Plasma aliquots were transferred into cryostat tubes and stored until quantification. Plasma folic acid and vitamin B12 concentrations were measured using immunoassay kit from Abbot. The methods to measure the other biomarkers and metabolites in the folate/homocysteine/glutathione pathway in our study have been described in various Indian and international Journals.

Table I
Plasma biomarker concentrations between NTD cases and controls.

	NTD* Cases (N=4)		Controls (N=16)		P value
	Mean ± SD	Median (Range)	Mean ± SD	Median (Range)	
Homocysteine (µmol/L)	9.40 ± 3.02	8.66 (5.24 – 21.82)	7.56 ± 1.68	7.45 (4.13 – 13.33)	<.0001
Folate (µmol/L)	26.22 ± 15.19	20.85 (6.66 – 74.66)	26.66 ± 13.06	23.10 (7.50 – 90.91)	0.4841
Vitamin B12 (pmol/L)	337.83 ± 149.18	291.43 (160.40 – 698.70)	368.97 ± 149.78	337.88 (74.31 – 926.68)	0.1771
Vitamin B6 (nmol/L)	36.25 ± 11.29	36.15 (19.20 – 64.70)	36.26 ± 11.35	34.33 (14.90 – 82.76)	0.9808

*Neural tube defect

We found that lower maternal plasma vitamin B12 concentration was associated with an increased risk for NTDs. Our Study results correlate with other studies done elsewhere. So we conclude that increased maternal oxidative stress and decreased methylation capacity may

contribute to the occurrence of NTDs. Further analysis of relevant genetic and environmental factors is required to define the basis for these observed alterations. Limitations of our study should be considered. The blood obtained to measure biomarkers was collected well after the index pregnancies had ended. The median interval between the end of pregnancy and blood draw for all subjects in our study is 20.7 months ranging from 4 to 63 months with no difference between cases and control. The small sample size included in our study may limit the power to detect differences in some biomarkers. For example, animal studies have demonstrated that methionine plays an important role in the normal closure of the rodent neural tube.

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5]

AgNORs IN SQUAMOUS CELL CARCINOMA OF HEAD AND NECK

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Key word : AgNORs score, squamous cell carcinoma, head and neck

ABSTRACT :-

The numbers of nucleolar organizer regions (AgNORs) per cell has been considered as an indicator of the cellular proliferative activity. A study is carried out to examine whether AgNOR numbers relate to the growth rate in squamous cell carcinoma of the head and neck. **Method:** AgNORs were stained by a one step silver method and examined in representative paraffin sections from 50 cases of squamous cell carcinoma of the head and neck. **Results:** the mean AgNOR numbers per cell in squamous cell carcinoma of the head and neck were higher than those in normal oral mucosal epithelium. **Conclusion:** The AgNOR numbers were related to the growth rate of squamous cell carcinoma of head and neck, Thus the AgNOR count could be used as a useful marker for investigating the cellular proliferative activity.

INTRODUCTION :-

Nucleolar organizer regions (NORs) are loops of ribosomal DNA (rDNA) that transcribe into ribosomal RNA (rRNA). NORs are located on the stalks of the acrocentric chromosomes (chromosome 13, 14, 15, 21, 22)^(1,3,5,8,9). Silver stained nucleolar organizer regions (AgNORs) are argyrophilic non-histone proteins associated with NORs and include RNA polymerase I, C23 proteins and B23 proteins^(3,5,8). The number of AgNORs in the cell is believed to reflect nucleolar activity and to be related to cellular proliferative activity^(6,7). Recent reports suggest that the AgNOR counts on routinely processed paraffin embedded tissue sections may facilitate the prediction of the biologic behavior. These studies have a clear separation between benign and malignant counterpart. In this study we investigated the usefulness in grading of squamous cell carcinoma of head and neck.

METHOD :-

Specimen of squamous cell carcinoma of head and neck from 50 patients were chosen from L.G General Hospital, Ahmedabad during June 2002 to November 2004. All specimens were collected by surgical excision or by as a biopsy. Control group were chosen from normal oral mucosal epithelium. The tissue sections were cut into slices 4µm thick and stained by routine H&E stain as well as AgNOR stain was performed by one step silver staining method.

Briefly specimens were stained by the one step method of Ploton et al, exposed for 40 minutes at room temperature in the dark to a freshly prepared solution of one part 2% gelatin solution in 1% aqueous formic acid to two parts 50% aqueous silver nitrate solution and washed with deionised water, dehydrated and mounted^(2,7,8).

AgNOR were seen as distinct, silver positive intranuclear black dots and were examined under oil immersion lens. One hundred cancer cells were chosen at random and the mean number of AgNORs per cell was calculated for each specimen.

RESULTS AND DISCUSSION :-

Although conventional clinic pathological staging or histological grading or both, may be useful in clinical assessment of squamous cell carcinoma of head and neck, these methods do not determine the growth rate of the tumor in individual patients. The tumor growth rate has been estimated by the cellular proliferative activity of the tumor. In the present study of evaluation of AgNOR count in SCCs of head and neck, mean value was compared with study of other workers and thus it was suggested that this method can be used to differentiate different grades of carcinoma.

Recently NORs have been detected by AgNOR staining^(2, 7, 8) because this technique of one step silver staining is simple and quick and can be applied to paraffin embedded specimen.

The number of AgNORs in the cells of the squamous cell carcinoma of head and neck ranged from 2.39 to 8.95. In present study results of 50 cases were compared according to site, age, sex, and grading and number of AgNOR dots with those of Steven M. Hirsch et al 1992⁽¹¹⁾, Jozsef piffko et al, 1997⁽¹²⁾ and B. Arora et al, 2002⁽³⁾. In the present study the number of NOR dots increased with increasing grade of SCCs of head and neck, while the size of the NOR decreased and dots became more irregular with increasing grade.

Table 1 shows comparison of site distribution of present study with the study of Steven M.Hirsch et al 1992⁽¹¹⁾.

TABLE – 1

Site	Study of Steven M. Hirsch		Present Study	
	No. Of Cases	Percentage (%)	No. Of Cases	Percentage(%)

Site	Study of Steven M. Hirsch		Present Study	
	No. Of Cases	Percentage (%)	No. Of Cases	Percentage(%)
Oral cavity	21	33	24	48
Pharynx	16	24	11	22
Larynx	22	33	09	18
Others	07	10	06	12
Total	66	100	50	100

Present study found that 35 cases (24+11) of SCCs originated from the oropharynx (70%) whereas Steven M. Hirsch et al study found that 37 cases of SCCs originated from the oropharynx (57%).

TABLE – 2

		Jozsef Piffko et al study		Present Study	
		No. Of cases	Percentage (%)	No. Of cases	Percentage (%)
Age	<50 Years	42	52	25	50
	>50 Years	38	48	25	50
Sex	Male	67	84	40	80
	Female	13	16	10	20
Histological Grading	I	25	32	13	26
	II	42	54	31	62
	III	11	14	06	12

Table 2 shows the comparison of age, sex and histological grading of present study with the study of Jozsef piffko et al, 1997⁽¹²⁾ and all these parameters were correlated with study of Jozsef piffko et al, 1997. Thus the age of the patients varied from 35years to 80years with maximum number of patients in the fifth decade of life. Male to female ratio was 4:1 and majority of the cases of SCCs were in grade-II.

TABLE – 3

Grading	Study of B. Arora et al, 2002 mean AgNOR count	Present study Mean AgNOR count
I	2.39	2.36
II	3.55	3.72
III	5.59	5.83
IV	8.95	-

Table 3 shows present study of mean AgNOR count in grade I, II and III was 2.36, 3.72 and 5.83 which was comparable with 2.39,3.55 and 5.59 mean AgNORs in grade I, II and III of D. Arora et al, 2002⁽³⁾ study.

SUMMARY AND CONCLUSION :-

AgNOR count is useful in distinguishing between low and high grade nonhodgkin's lymphoma, benign and malignant salivary gland tumors and adenocarcinoma of the colon. ^(1,3,6,9).

Crocker and Nar⁽⁷⁾ applied this technique to a large series of NHL and observed that the number of AgNOR dots within the nuclei was much greater in high grade than in low grade and the difference was clear cut without any grey area between the two groups. In recent years DNA flow cytometry, AgNOR counts and ki 67 labeling have been commonly used to study cellular proliferation ⁽⁴⁾. It is likely that mean number of AgNORs relate to the number of cells in S phase and with ploidy. Thus AgNOR counts may assist in the grading of neoplasm ⁽⁴⁾. Study shows that AgNOR numbers are related to the growth rate of squamous cell carcinoma of head and neck.

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ADENOSINE DEAMINASE ACTIVITY IN PULMONARY TUBERCULOSIS

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ABSTRACT:

Adenosine deaminase (ADA, adenosine aminohydrolase, EC 3.5.4.4), an enzyme involved in purine metabolism, catalyses the hydrolytic cleavage of adenosine and 2'deoxyadenosine, irreversible converting them into inosine and 2'deoxyinosine respectively. ADA activity increases during cellular activation for energy demand to detoxify the toxic metabolites.

Studies have suggested the sensitivity and specificity of the assay of serum and pleural fluid ADA in serum and pleural effusions due to pleural TB, malignancy, and other pulmonary diseases. The assay of serum/ pleural fluid ADA is simple, easy, cost-effective and reliable criteria that are considered important in the routine evaluation of the patients with symptoms suggestive of PTB particularly where the prevalence of tuberculosis is still high. This is the situation in our country, hence it should be recommended to include serum and pleural fluid ADA activity in the battery of routine investigations for the diagnosis and prognosis of PTB.

INTRODUCTION

Pulmonary tuberculosis (PTB) remains one of the leading causes of morbidity and mortality worldwide accounting for approximately 8 million new cases and 2 million deaths annually. Definitive diagnosis of PTB depends on sputum smear examination and culture. Only up to 50% of pulmonary and extra-pulmonary tuberculosis cases can be diagnosed by smear examination. Traditional culture methods take around 2 to 3 weeks before the diagnosis can be established. If the diagnosis of PTB is delayed it leads to increased morbidity and mortality. Early diagnosis, initiation of optimal treatment and response of therapy would not only enable the cure of an individual patient but also curb the transmission of infection as well as the chances of emergence of drug-resistant strains.

Adenosine deaminase (ADA, adenosine aminohydrolase, EC 3.5.4.4), an enzyme involved in purine metabolism, catalyses the hydrolytic cleavage of adenosine and 2'deoxyadenosine, irreversibly converting them into inosine and 2'deoxyinosine respectively. ADA activity increases during cellular activation for energy demand to detoxify the toxic metabolites. It plays an important role in lymphocyte and monocyte maturation and activity. Increased serum level of ADA has been reported in several diseases characterized by an enhanced cell mediated immune (CMI) response, such as typhoid fever, bacterial pneumonia, infectious mononucleosis and tuberculosis. There is limited data on the use of serum ADA levels to diagnose active PTB in adults. Further, the prognostic role of serum ADA in active PTB has not been studied so far. The purpose of this study was to evaluate the role of serum and pleural fluid ADA activity in the diagnosis and prognosis of PTB.

MATERIAL AND METHODS

405 subjects (indoor and outpatient clinic of either sex) aged 10 to 80 years, suffering from PTB, were taken from Kamla Nehru TB and Chest hospital, attached to Dr.S.N.Medical College, Jodhpur. 54 persons served as controls. All the patients were examined clinically and investigated. Sputum examination for acid fast bacilli and chest skiagram were carried out. Routine hematological examinations were also performed in peripheral blood of controls as well as patients before and after 3 months of treatment. Pleural fluid analysis was also carried out in 142 patients suffering from PTB. The exudates were distinguished from transudates by Pleural fluid protein cut-off level of 3 g/dl or more. Pleural fluid was subjected to routine microscopic and biochemical analysis.

The subjects were divided into three groups-Group I, healthy controls (n=54); Group II, (n=405) untreated and recently diagnosed, clinically as well as radiologically established patients suffering from active PTB; and Group III (n=124) included followed up cases of PTB who were receiving effective antituberculosis therapy for a period of three months.

The ADA assay was performed simultaneously in serum and pleural fluid, using the commercially available ADA-MTB kits, supplied by Microxpress, Tulip diagnostic (P) Ltd., Goa (India) based on the method of Guisti. The results were statistically analyzed by Student t-test and by calculating Pearson's correlation coefficient (r).

RESULTS AND DISCUSSION

Among 54 healthy controls there were 27 males and 27 females, most of them in the age group 31-60 years. The mean serum ADA activity in control was 5.7 ± 1.3 U/L. There was no significant difference in serum ADA activity in control subjects with respect to age and sex. The serum and pleural fluid ADA activity in untreated PTB subjects was observed to be 72.2 ± 16.3 U/L and 100.0 ± 19.48 U/L respectively. A positive correlation between serum and pleural fluid ADA, and percentage of lymphocytes in peripheral blood and pleural fluid was observed. This may be suggestive of their association with events in CMI.

Though it is difficult to explain the exact cause for higher ADA activity in patients with PTB, it is known that ADA is predominant enzyme of lymphocytes and its serum levels remain high in diseases where cellular immunity is stimulated, e.g. PTB. In pathological conditions, the clearance capacity of lungs is decreased leading to increased number of cells in the pleural fluid and the recirculation of the activated lymphocytes may cause a high serum ADA activity in patients with pulmonary diseases for detoxification of toxic metabolites. Ishii and Green reported

that adenosine is toxic to the cultured mammalian cells and that it interferes with pyrimidine biosynthesis.

In the followed up subjects, the serum ADA activity was 30.9 ± 11.7 U/L. In the untreated phase, the serum ADA activity in PTB patients was significantly higher than the healthy controls and followed up subjects ($p < 0.001$). a significant difference in the mean serum ADA activity was also observed among controls and followed up subjects. There were neither any significant difference in serum ADA activity after the first three months of treatment. This could be due to repeated thoracocentesis, improvement in the clearance capacity of lungs and normalization of the altered lymphocytes turnover. It seems that the activity of the enzyme is correlated more to the maturity stage of lymphocytes than to their number.

CONCLUSION

Previous reports have suggested the sensitivity and specificity of the assay of serum and pleural fluid ADA in serum and pleural effusions due to pleural TB, malignancy, and other pulmonary diseases. The assay of serum/ pleural fluid ADA is simple, easy, cost-effective and reliable criteria that are considered important in the routine evaluation of the patients with symptoms suggestive of PTB particularly where the prevalence of tuberculosis is still high. This is the situation in our country, hence it should be recommended to include serum and pleural fluid ADA activity in the battery of routine investigations for the diagnosis and prognosis of PTB.

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CYTOGENETIC STUDY OF CASES OF DOWN SYNDROME IN GUJARAT.

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Abstract :

Down syndrome (DS) or trisomy 21 can be caused by three types of chromosomal abnormalities: trisomy 21, translocation or mosaicism. The cytogenetic diagnosis, made through karyotype examination, is important mainly to determine recurrence risks to assist genetic counseling. The aim of this study was to carry out a cytogenetic profile of 26 clinically diagnosed cases of DS attending Pediatrics Outpatient Department (OPD) and admitted in Pediatrics ward, Civil Hospital, Ahmedabad as well as cases from B.M. Institute of Mental Health, Ashram road, Ahmedabad with the purpose of establishing the nature of the chromosomal abnormalities of these patients. 26 clinically diagnosed DS patients were selected, their blood samples were taken and their karyotypes were prepared at Genetics Laboratory at B.J. Medical college, Ahmedabad. Karyotype analysis revealed that, out of 26 cases trisomy 21 was found in 19 (73%) case, normal karyotype was found in 7(27%) cases and not a single case of translocation and mosaicism was found. Nondisjunction was the main cause of Down syndrome, as the majority of the patients have trisomy of chromosome 21. The cytogenetic pattern of Down syndrome is variable among different studies. So cytogenetic analysis of suspected DS is of value to objectively confirm the diagnosis & to provide a basis for genetic counseling.

Key words : Down syndrome (DS), chromosomal abnormalities, trisomy 21, karyotype, genetic counseling, nondisjunction

Introduction

Down syndrome (DS) is one of the commonest chromosomal abnormalities found in humans occurring once in every 800 to 1000 live births. DS affects the people of all races & economic levels and occur most often in offspring of mothers conceiving at older age. It can be caused by 3 types of chromosomal abnormalities : free trisomy 21, translocation or mosaicism.

Free trisomy 21 is characterised by the presence of three complete copies of chromosome 21, generally resulting from nondisjunction during maternal meiosis and is seen in about 95% of cases. Translocations are attributed to 3-4% of the cases, with Robertsonian translocation involving chromosomes 14 and 21 being the most common type. Mosaicism, characterized by some cells containing 46 chromosomes and others with 47 chromosomes, is reported in 1% of Down syndrome cases. These rates of cytogenetic abnormalities are described in the basic literature but specific surveys report variations in the cytogenetic pattern of the syndrome.

Although there is considerable variation in the physical features of individuals with Down syndrome, most present with a range of characteristics that enable clinical diagnosis of the syndrome. However, cytogenetic diagnosis is important for confirmation of the clinical diagnosis and, importantly, to determine the risk of recurrence, thereby helping genetic counseling. This risk differs greatly between the cases as free trisomy and mosaicism generally do not recur in siblings of people with Down syndrome (approximate risk of 1% for women under 30 years old), whilst translocation may be recurrent. For translocations, if both parents present with normal karyotypes, the risk of recurrence is 2% to 3%. However, if one of the parents is the carrier of a balanced translocation, the risk of recurrence depends on this parent's gender and on the type of translocation. In the case of Robertsonian translocations, the recurrence risk is around 10 to 15%

when the mother is the carrier and from 2 to 15% when the carrier of this balanced translocation is the father. On the other hand, if one of the parents is the carrier of a balanced translocation involving two chromosomes 21, the recurrence risk for Down syndrome is 100%. Thus, once diagnosed as a case of Down syndrome due to a translocation, a karyotypic analysis of both parents is recommended.

The object of this work was to examine the cytogenetic abnormalities in patients with clinically diagnosed DS cases attending the paediatric OPD and admitted in paediatric ward, civil hospital ahmedabad as well as cases from B. M. Institute of mental health, ahmedabad during the period of 2003 to 2005 with the purpose of establishing the nature of the chromosomal abnormalities of these patients.

Materials and Methods

For the present study, 26 clinically diagnosed DS patients were selected. Their detailed clinical history was taken & clinical examination was done. To obtain their karyotype, about 0.8 ml of venous blood was collected in heparinized vacuttes. Culture setting was done using freshly tapped blood and put it in incubator at 37 degree for 72 hours. After that harvesting was done & finally the metaphases on the slides were obtained. Then those slides showing metaphases with good morphology were selected and kept under dry wooden boxes for aging. After 7 days, banding procedure was done using Giemsa, freshly prepared Trypsin and EDTA solutions. About 25 metaphase plates were observed in each case and finally, a photograph was obtained from a good quality metaphase slide with the help of a black and white film loaded camera attached with a photomicroscope with an exposure time of 8-15 seconds. The chromosomal findings were described according to the International system of Human Cytogenetic Nomenclature and finally, Karyotype was prepared using conventional cut and paste technique.

Results

In the present study of 26 cases of DS patients, mental subnormality was present in 92.3% of cases, hyponia in 69.2%, mongoloid facies in 84.6%, prominent epicanthal folds in 73.1%, protruded tongue in 57.7%, simian crease in 61.5% & Sandle sign was found in 42.3% of cases.

Table-1 : Distribution of clinical features in DS patients studied.

Clinical features present.	Number of patients (%)
Mental subnormality	24(92.3%)
Hypotonia	18(69.2%)
Mongoloid facies	22(84.6%)
Epicanthal folds	19(73.1%)
Protruded tongue	15(57.7%)
Simian crease	16(61.5%)
Sandle sign	11(42.3%)

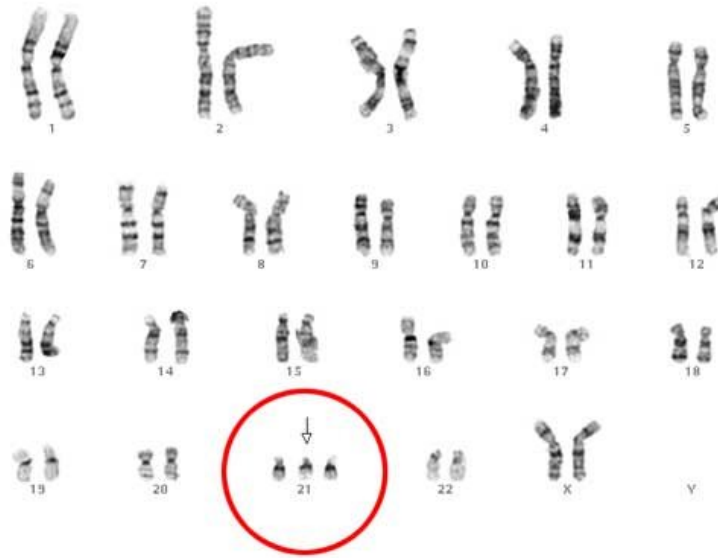
The cytogenic evaluation was done by karyotyping & were as follows :

Table-2 : Cytogenic findings in DS patients studied :

Total no. of patients studied	Trisomy 21	Translocation	Mosaicism	Normal
26	19(73%)	-	-	7(27%)

The above table shows that out of 26 clinically diagnosed DS cases, chromosomal abnormality was found in 73% of cases & 27% of cases were chromosomally normal. Out of 19

cases of chromosomal abnormality, all cases show trisomy 21. We had not found any single case of translocation and/or mosaicism in our study.



Discussion

The trisomy 21 is known by various names. Mongol in U.K., mongoloid in North America, "Mongooltges" in Holland, Down's in Russia. The geneticist termed it trisomy 21 or Translocation 21. Langdon Down (1866) had given the name of Down syndrome. The commonest presentation of a patient with DS are as follows : mental retardation, mongoloid facies, prominent epicanthal folds, protruded tongue, simian crease. Sandle sign help in rapid diagnosis of DS.

The cause of DS is full trisomy in 92% of cases, translocation in 3-4% of cases and mosaicism in 2-4% of cases. In most instances of regular trisomy both parents have a normal chromosomal constitution. Very few infants with regular trisomy are the off spring of mothers with DS. Mosaic DS are born to chromosomally normal parents and show less marked physical stigmatas, particularly if there are a large proportion of normal cells.

In translocation DS (3-4%), almost all translocations are Robertsonian translocations, named for Dr Robert, an Australian chromosome expert who originally described this type of translocation.

In about one fourth of translocation DS cases, the translocation is inherited. A carrier parent can have a) a chromosomally normal child, or b) a balanced carrier child like the parent, or c) a DS child. When the mother is a balanced carrier of a $t(14;21)$, there is about 12% risk for another DS child to be born in each subsequent pregnancy. When the father is the carrier, the above risk drops to about 3% for the DS. The reason for this difference is not clear.

In about three-fourths of translocation DS neither parent is a carrier and a mutation in germ cells of one parent has caused the translocation. No one knows what causes these mutations.

In cases of a new or de novo Robertsonian translocation, the risk of a couple producing a second DS is low, about 2-3%. There are other rare translocations leading to DS. One is Robertsonian translocation between two 21 chromosomes, $t(21;21)$. This has 100% risk for DS when transmitted by a carrier parent.

Thus in mongolism various patterns of chromosomal aberration can be seen and exact diagnosis of it is very important before giving any genetic counseling.

Conclusion

For the present study 26 clinically diagnosed DS patients were selected from paediatric OPD as well as paediatric ward, Civil Hospital, Ahmedabad and cases from B.M.Institute of Mental Health, Ahmedabad. In all cases, relevant history, clinical findings and necessary

investigations were noted. Blood samples were collected and cytogenetic/karyotypic study was performed at Genetics Laboratory, B.J. Medical College, Ahmedabad. Samples were cultured, harvested and finally slides were prepared. There after photographs were obtained from the slides showing good quality metaphase using photomicroscope and karyotypes were prepared using conventional cut and paste technique. Cytogenetic evaluation was done. Out of 26 cases of clinically diagnosed DS, chromosomal abnormality was found in 19 cases and in 7 cases normal karyotype was found. Trisomy 21 was found in all chromosomally abnormal cases. Not a single case of translocation and/or mosaicism was found.

The common clinical features in case of DS were mental subnormality (92.3%), hypotonia(69.2%), mongoloid facies with mongoloid slant (84.6%), prominent epicanthal folds (73%), enlarged protruded tongue (57.6%), simian crease (61.5%), wide gap between great toe and second toe (Sandle sign) (42.3%)

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IMPACT OF YOGA ON NEGATIVE EMOTIONS AND AFFECTS ,

AN ORGANIZATIONAL BASED STUDY

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Abstract

Objective :Work environment of major organization especially the newly developing organization is associated with as high-level competition, ever-mounting targets, high expectations, adjustments in families and home, dealing with difficult personalities are factors responsible for anxiety and stress and many other negative emotions. The recent studies have shown that yoga Practice is associated with decrease negative emotions, anxiety and stress and thus harmful role of negative emotions can be reduced. The aim of study is to assess emotions in working

organization at end of the day by using modified Positive Affect Negative Affect Scale (PANAS) and reassess after the practicing a yoga session.

Materials and Methods:

The study was conducted among eighteen participants from a developing medical organization of Ahmedabad Gujarat India .The participants included were faculty members of the organization. One week yoga camp was held to teach asanas, pranayama, meditation and - omkar chanting. Emotional Assessment was carried out by using a version of Positive Affect Negative Affect Scale (PANAS). It has ten questions each to measure negative emotion/ affect (NA).Pre and post yoga session scores was assessed by Wilcoxon signed rank test.

Results:

Eighteen sets of pre–post data were analyzed. There was a significant reduction in Negative Emotions/ Affect as analyzed by Wilcoxon's signed rank test .

Conclusion:

It is feasible and safe to conduct a weeklong yoga camp in organization, and yoga practices significantly reduce the negative emotions / affect as assessed by PANAS. The impact of yoga on emotions / affective domain of participants within an organization was favorable as a result of group yoga . The research hopes to learn more about the impact on attitude, morale, performance and perspective as well as physical health and improve wellbeing as result of indirect impact of yoga on participants.

Keywords: Impact of Yoga camp, reduction in negative emotions, Organization

Introduction

Physiologically emotions is associated with cognition, an awareness of the sensation and usually its cause; affect, the feeling itself; conation, the urge to take action; and autonomic nervous system changes such as change in Blood pressure ,heart rate and sweating. The hypothalamus and limbic systems are intimately concerned with emotional expression and with the genesis of emotions. In brief, the awareness and feeling is the most important component of emotions. Such feelings can be perceived subjectively and assessed by grading on subjective scale i.e. one such scale is **Watson, D et al PANAS Scale**. Such scaling and scoring is always controversial for validity and affected by subjective variation and when such score is used for comparison than it more open to controversy as discussion statistics while reviewing tests i.e. Wilcoxon signed rank test.

Work environment of major organization especially the newly developing organization is associated with as high-level competition, ever-mounting targets, high expectations, adjustments in families and home, dealing with difficult personalities, etc causing heightened anxiety and stress and many other negative emotions. When the resources can not balance negative emotions, result is distressful negative emotions i.e. aggression, fear, distress, irritability, anger etc.

Studies that have assessed the emotional states by 'Profile of Mood States' after yoga have reported significant improvements in negative emotions including tension-anxiety, dejection, anger-hostility, fatigue-inertia, and confusion-bewilderment. A study that compared African dance and yoga showed reduced perceived stress and negative emotional status with both these practices but reduced cortisol levels in the yoga group. The utility of yoga in improving mood and emotions may be related to its influence on physiological states of arousal through establishing stable autonomic balance which is crucial for stabilization of emotions. Ameliorating negative emotions is the main concern in stress management. According to the World Health Organization, job Organizational stress is a "worldwide epidemic" and costs U.S. industries "\$200 to 300 billion annually as assessed by absenteeism, diminished productivity, employee turnover, accidents, direct medical, legal, and insurance fees, workman's compensation awards and the like others. In one study in US among nearly 2,000 individuals surveyed, almost all had significant levels of stress in their professional lives, and stress impacted their relationships and health. Stress at work can be costly to both individuals and to organizations. Ganster and Schaubroeck (1991) suggested work stress is "a causal agent in physical and mental disorders as well as organizational outcomes such as absenteeism and reduced productivity". In recent years, much research has addressed the importance of individual health its relationship to the healthy organization. Less research has been done on how and to what extent yoga practice, can reduce individual stress and make a health-inspiring impact on the emotion, moral, productivity, and work environment of an organization as a whole.

In this context it is found that Yoga was found to be of benefit on three levels: it allowed for greater bonding, mental or psychological flexibility and working out conflicts with less competition. Finally, yoga was found to benefit the organization's health insofar as client confidence grew and better work relationships were developed.

Materials and Methods:

Emotion is derived from the French word *émouvoir*. This is based on the Latin *emovere*, where *e-* (variant of *ex-*) means "out" and *movere* means "move. The related term "motivation" is also derived from the word *movere*. Emotion fundamentally involves "physiological arousal, expressive behaviors, and experience." The it is usually involuntary responses associated with autonomic nervous system arousal. And it is usually notion that emotions are difficult to assess - measure and control. Watson *et al.* measured these emotions under two major categories namely positive and negative affect. Pleasant emotions of different intensities may be grouped as 'positive affectivity' (PA) and unpleasant emotions under 'negative affectivity' (NA). Negative affect. (NA) is the dimension with aversive mood states and subjective distress.

Study of impact of yoga practice on emotional status was conducted among eighteen participants from a developing medical organization of Ahmedabad Gujarat India. India is pioneer country where the yoga practice is originated since millenniums. The participants included were faculty

members of the organization. Seven days yoga camp was held to teach asanas, pranayama, relaxation, stretching exercises, devotional sessions- omkar chanting. By circular about 150 faculties were informed about the yoga camp. Total 55 participants show interest to join the camp. Out of 45, 35 subjects participated active in the camp. On last day 18 participants were present and participated in study.

Yoga session was of 45 minutes which include

15 minutes of Pranayam practice

15 minutes Asana

15 minutes Meditation and omkar chanting.

Emotional state Assessment by PANAS was carried out before and after yoga session after one week yoga camp. It has negative PANAS had ten points each assessing negative affect (NA).

TABLE 1:
Negative Emotions /affect domain studied in PANAS Scale

1	Distressed
2	Upset
3	Guilty
4	Scared
5	Hostile
6	Irritable
7	Ashamed
8	Nervous
9	Jittery.
10	Afraid

Overview of Daily schedule of one week yoga camp

Daily one hour.

Day 1: Thursday Filling forms,
Introduction of yoga, basic Asanas.

Day 2: Friday Asanas & Pranayama Omkar chanting
Types of yoga

Day 3: Saturday More Asanas & Pranayama
Patanjali yoga

Day 4 : Sunday Off

Day 5: Monday Practice: Asanas & Pranayama
Meditation/Shavasana,
Bandhes and Mudras

Day 6: Tuesday Practice of Asanas & Pranayama
Yoga as medicine and stress management

Day 7: Wednesday Practice of Asanas & Pranayama
Discipline and limitations of yoga

Day 8: Thursday Practice of Asanas & Pranayama, meditation
Concept of samadhi

Filling up the forms

Statistical tests:

Pre and post session scores were measured and assessed by Wilcoxon signed rank test.

Results:

Eighteen sets of pre–post data were analyzed. There was significant reduction in Negative Emotions/ Affect score after yoga practice as analyzed by Wilcoxon’s signed rank test .

Results were summarized in following tables.

Total 18 subject ,[12 male 6 female] and were age range 27 to 54 mean age 40.44 standard deviation 7.99.

Table 2

Demographical data

Participants	
Male	12
Female	6
total	18
Age Range	
25-35	5
36-45	8
46-55	5
Total	18

Table 3

showing Negative emotion /affection scores before and after Yoga session

	Total of 18 Participants	Mean	SD
Pre yoga Session	546	28.3	4.64
Post yoga session	282	15.66	3.04

Discussion:

The results of the study demonstrated that yoga had beneficial effects in terms of reducing negative emotions/ affects. As there is a fairly direct correlation between negative emotions and negative work performance, it is vital to reduce such negative emotions. The research also strongly suggested that yoga improved the individual's negative emotional status this will indirectly improve the mental and physical health and therefore, positively impact the organization to which the members belong to.

Yoga is associated with moving the body mindfully through a series of poses, as well as stretching and balancing the body and breathing control and meditation.

The present study concluded that yoga practice among participants impacts negative emotions in positive side and decreasing the stress and anxiety. It also studied the collective and communal experience of doing yoga in the workplace and it can be stated that short term yoga session at work place is a answer to organization to improve the organization behaviors.

Meditation is different than just relaxation .Meditation is rather a spiritual experience while relaxation is merely physical one. Wisnieski and Askar support the concept of spirituality in the

workplace. In one study they concluded that spiritual people are more tolerant, less susceptible to failures and favour the democratic style of leadership- factors which are very important for improving organizational performance. And Yoga is arguably the most effective way or inculcating spirituality in the workplace. Hasmukh Adhia, HR Nagendra and B Mahadevan concluded in their study on yoga at work place that Yoga being effective in bringing about an improvement in organizational performance by measuring five indicators of organization performance

In this context, Yoga is found to be of benefit on three levels: it allowed for greater bonding, mental or psychological flexibility and working out conflicts with less competition.

Though limited studies are done to explain the mechanism by which yoga can help to reduce negative emotions- affects .It is the **shallow breathing** that create a state of arousal in the sympathetic nervous system, which can lead to anxiety, panic, and fear and negative emotions. In Yoga pranayam, deep and slow abdominal breathing exercises decrease arousal, which in turn calms and focuses the mind, relaxes the body, oxygenates the blood, soothes anxiety and stress, and promotes clear thinking. Meditation, Concentration and body control involved in asana and pranayam help to free the mind from worries, tension stress and mental distractions . A study published in IJPP showed that participants who practiced yoga consistently for 10 months were less anxious and less Stress prone. Abdominal Breathing triggers and meditation induce the relaxation response to reduce stress and anxiety and revert the stress response.

Conclusion:

It is feasible and safe to conduct a weeklong yoga camp in organization, and yoga practices can significantly reduce the negative emotions- affects. Studies on affective wellbeing have shown the beneficial role of positive emotions on cognitive processing and the harmful role of negative emotions on coping and health status.

The present study describes the impact of yoga on emotions / affective domain of participants within an organization as a result of group yoga. More research are required to learn more about the impact on yoga on attitude, thinking , morale, performance and as well as physical health and Improve wellbeing as result of impact of yoga on participants. One thing is sure that occupational -organizational stress has a serious effect on emotional status of an individual and has impact on the quality and quantity of work .And in house yoga practice can help significantly to improve the productivity of individual and organization by improving emotional status.

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COMPARATIVE STUDY OF HAEMOGLOBIN CONCENTRATION IN HYPERTENSIVE AND NORMOTENSIVE SUBJECTS..

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Abstract:

Hypertension leads to functional disturbances in many systems of the body. There is a possibility that hypertension can alter haematological parameters of the body. This study is done to check the relationship between hypertension and hemoglobin concentration in the body. Objective of

this study is to compare blood hemoglobin concentration in hypertensive and normotensive subjects, separately for male and female. To undertake this study, 24 cases of hypertension were taken, which included 13 female and 11 male hypertensives. Controls with matching age and gender and of same numbers of subjects (24) as hypertensive group were taken. Hb concentration of male hypertensive and male normotensive as well as female hypertensive and female normotensive were compared and analysed statistically. The mean hemoglobin of male hypertensive and normotensive group were 13.29 ± 1.1 and 14.45 ± 1.39 respectively

The mean Hb of female hypertensive and normotensive group were 11.35 ± 1.23 and 12.1 ± 1.16 respectively. Male hypertensives have significantly lower hemoglobin concentration as compared to male normotensives, whereas, there is not significant difference in hemoglobin concentration between female hypertensives and female normotensives. This study concludes that hypertensive males tend to have significantly lower hemoglobin concentration as compared to normotensive males, but this can not be said in the case of females.

Introduction:

There is a strong correlation between changing lifestyle factors and increase in hypertension in India. Pooling of epidemiological studies shows that hypertension is present in 25% urban and 10% rural subjects in India. Recent reports show that borderline hypertension (systolic BP 130-139 and/or diastolic BP 85-89 mmHg) and Stage I hypertension carry a significant cardiovascular risk and there is a need to reduce this blood pressure². The reported prevalence of hypertension varies around the world, with the lowest prevalence in rural India (3.4% in men and 6.8% in women) and highest in Poland (68.9% in men and 72.5% in women).⁵ Hypertension is one of the leading risk factors for mortality and ranked third as a cause for decrease disability adjusted life years.⁴ Hypertension affects kidneys, heart and many organs. Thus it is needed to check whether hypertension affects hematological parameters like hemoglobin or not, and if it affects them then can these parameters be useful as indicators of prognosis of the hypertension or not. Present study is to check whether any relationship between hypertension and haemoglobin concentration exists or not.

JNC-7 (Joint National Committee On Prevention, Detection, Evaluation And Treatment Of High Blood Pressure.) criteria for hypertension in adults³ :

1. Normal blood pressure: $<120/80$
2. Pre hypertension: $120-139/80-89$
3. Stage 1 Hypertension: $140-159/90-99$
4. Stage 2 Hypertension: $>160/100$

Objective:

To compare the hemoglobin concentration in hypertensive and normotensive subjects.

Materials and methods:

To undertake this study, two groups were taken, one was the hypertensive group and another was normotensive (control) group. The hypertensive group included 13 female subjects and 11 male subjects, total 24 subjects. The normotensive (control) group also included 13 female and 11 male subjects, total 24 subjects. A thorough history taking and physical examination and hemoglobin estimation was performed for each and every subject of both groups. A written consent of every subject was taken for performing examination and collecting blood sample for hemoglobin estimation. Haemoglobin estimation was done by autoanalyser in the laboratory. The data was analysed statistically by Z test.

Inclusion criteria:

For hypertensive group:

1. Subjects who were established case of hypertension taking antihypertensive medicines.
2. Newly diagnosed subjects with confirmed hypertension by taking atleast three readings of blood pressure first two at the time of examinations, 5 minutes apart and another after one day of taking the first reading.
3. Age matched with control group.

For control group:

1. Subjects with normal B.P.
2. Healthy, age matched with hypertensive group.

Exclusion criteria for both groups:

1. History of any systemic illness.
2. History of diabetes mellitus.
3. history of any diseases or symptoms or signs having cardiac, vascular or neurological involvement.

Results:

There is no significant difference between the age of male hypertensive and control group as well as female hypertensive and control group (by using z test).

Table 1 : Age of male subjects:

Age	Hypertensive group	Normotensive group
Mean	58.54	58.18
SD	17.53	16.67

Table 2 :Age of female subjects:

Age	Hypertensive group	Normotensive group
Mean	51.89	50.53
SD	11.3	11.68

The mean hemoglobin of male hypertensive and normotensive group were 13.29 ± 1.1 and 14.45 ± 1.39 respectively.

Table 3 : hemoglobin concentration of male subjects:

Hb conc.	Hypertensive group	Normotensive group	Z value
Mean	13.29	14.45	0.23, $p < 0.05$
SD	1.1	1.39	significant

The mean Hb of female hypertensive and normotensive group were 11.35 ± 1.23 and 12.1 ± 1.16 respectively.

Table 4 : Hemoglobin concentration of female subjects :

Hb conc.	Hypertensive group	Normotensive group	Z value
Mean	11.35	12.1	1.59, $p > 0.05$
SD	1.23	1.16	Not significant

Male hypertensives have significantly lower hemoglobin concentration as compared to male normotensives, whereas, there is not significant difference in hemoglobin concentration between female hypertensives and female normotensives.

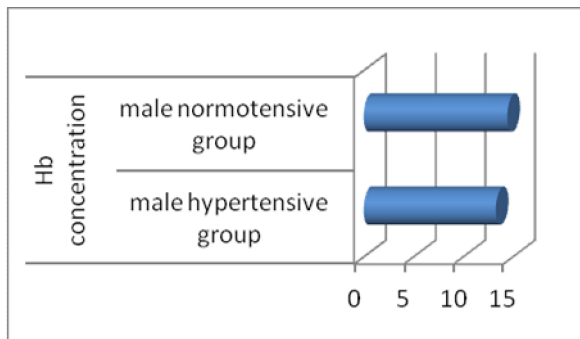


Figure 1 : Hemoglobin concentration of male hypertensive and normotensive group.

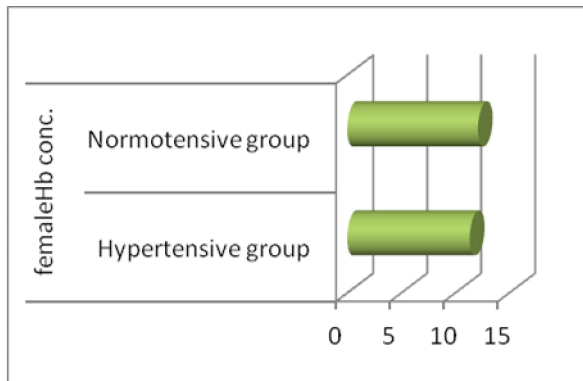


Figure 2 : hemoglobin concentration of female hypertensive and normotensive group.

Discussion:

In the present study, age is matched between normotensive and hypertensive groups, both for male and female groups. Though hemoglobin concentration between male hypertensive and normotensive varied significantly, there was no significant difference in Hb concentration between female hypertensives and normotensives. According to S. Julius (1993) in Corcoran lecture on sympathetic hyperactivity and coronary risk in hypertension, in hypertension sympathetic activation is associated with high plasma renin levels. Renin causes sodium and water retention in the body, which results in hemodilution, that can be cause for low Hb level in hypertensive subjects. There may be reduced production of erythropoietin and resistance of the bone marrow to erythropoietin stimulation. Antihypertensive drugs such as angiotensin receptor blockers and ACE inhibitors inhibit the bone marrow and response to erythropoietin.⁶ Congestive cardiac failure and renal failure due to untreated hypertension leads to low Hb concentration due to hemodilution in later stages. The exposure to reason of significant less hemoglobin in male hypertensives as compared to male normotensives and not significant difference between hemoglobin of female hypertensives and normotensives requires still more research, though a study is done establishing that hypertensive software professional male have lower hemoglobin concentration compared to their normotensive male colleagues¹.

Conclusion:

The result of this study may indicate the potential role of hemoglobin levels while monitoring the prognosis of male hypertensive patients. Still this study does not indicate the same for female hypertensive patients.

Limitations of the study:

1. Study was carried out in a small population.
2. Many other blood parameters were not included in the study.
3. BMI, waist hip ratio and body weight were not included in the study.

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EFFECTS OF MILD, MODERATE & SEVERE ANAEMIA ON ECG.

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Abstract:

India has highest prevalence of nutritional anaemia. Its prevalence is high in women & children. Anaemia results in tissue hypoxia. In anaemia as Hb concentration & RBC count decrease it causes hyperdynamic circulation leading to tachycardia. The abnormalities found in ECG were due to myocardial hypoxia resulting from decreased oxygen carrying capacity of the blood. To overcome myocardial hypoxia various hemodynamic & non hemodynamic mechanisms come to play a role to compensate for anaemia. But in the long term, hemodynamic alterations lead to gradual development of cardiac enlargement & ventricular hypertrophy. So if anaemia remains untreated it may lead to cardiac complications which lead to poor prognosis. This is the reason to study the effect of anaemia on ECG. The subjects for study were 75 men & women. Severity of anaemia was decided by Hb concentration. Study cases were divided according to comparison of severity of anaemia with: ECG changes, age group & ECG changes & type of ECG abnormality. In our study we found abnormality in ST segment & T wave. In this study, we have tried to summarize the effects of anaemia on ECG.

Key words: anaemia, ECG, myocardial hypoxia, preload & afterload.

Introduction

Anaemia is a low Hb concentration due to decreased red cell mass. Hb may get decreased due to dilution of plasma (as in pregnancy), reduced production or increased loss of RBCs & has many other causes.

Anaemia of chronic disease is associated with variety of diseases like infections, collagen vascular diseases, malignancy & renal diseases. Heart is affected according to the degree & severity of anaemia & presence or absence of secondary circulating changes in the body.

Anaemia may lead to increased cardiac output, increased heart rate, vasodilatation & in long term it may lead to cardiac enlargement & left ventricular hypertrophy.

Acute anaemia lowers coronary vascular resistance whereas chronic anaemia enhances formation of intercoronary collaterals & causes increase preload (venous return) & reduction in

afterload(peripheral vascular resistance). Gradual development of severe anaemia may lead to cardiac hypertrophy by causing vasodilatation.

In chronic anaemia heart dilates as well as hypertrophies resulting in “fatty degeneration” which occur due to disturbed metabolism of the cells. The pathological changes are maximum in subendocardial layer & particularly of left ventricle. In some cases of anaemia, irreversible damage may occur to heart due to long standing anaemia.

Materials & methods

This study was carried out in 75 patients of anaemia admitted in civil hospital Ahmedabad, Asarva. In all cases detailed history along with clinical examination, laboratory investigations & ECG were carried out.

Hematological investigations done were: Hb concentration & RBC count by optical density & impedance method in a machine called cell counter which provided idea about severity of anaemia.

Electrocardiogram(ECG) is a record made by the machine called the electrocardiograph. It is an instrument for making permanent record of small potential variations which occur in different parts of body due to electrical activity of the heart. ECG had provided guidance to study the effects of anaemia on heart.

Results

Anaemia is classified according to the level of Hb concentration.

Mild anaemia:-Hb:>8-12 gm%

Moderate anaemia:- Hb: 5-8 gm%

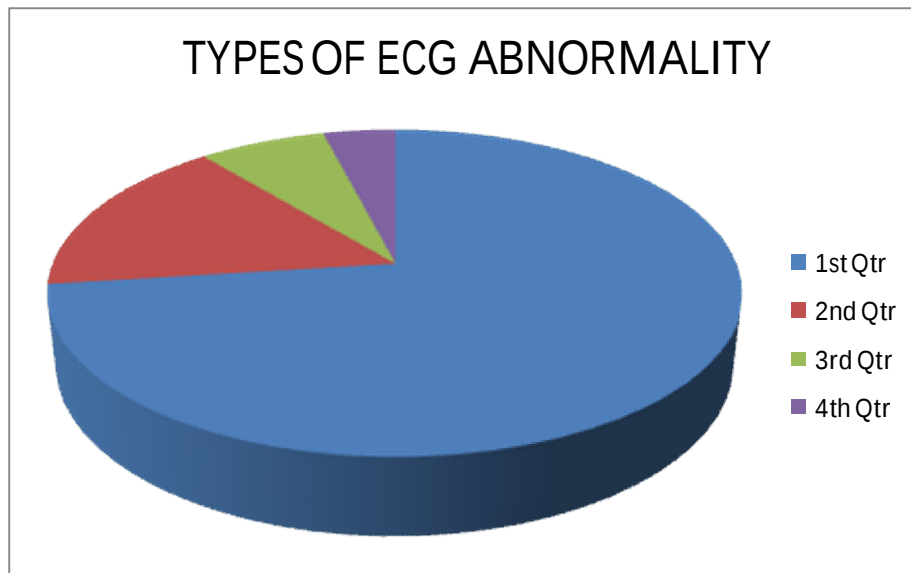
Severe anaemia:- Hb: <5 gm%

Table 1: Distribution of cases according to sex in mild, moderate & severe anaemia

Severity of Anaemia	Total Cases	Cases in Males	Cases in Females	ECG changes In males	ECG changes In females
Mild	25	23	2	6	0
Moderate	25	12	13	4	2
Severe	25	4	21	2	6

Above table shows cases of mild anaemia were found more in males as compared to females. But moderate anaemia was present equally in both the sex. Severe anaemia was found more in females as compared to males. ECG changes were found in 32% males & about 22% in females . According to distribution in severity ECG changes were found more in severe anaemia

about 32% & in mild & moderate anaemia equally about 24% of cases



1st qtr: normal ECG- 73% of cases

2nd qtr: abnormal ST segment- 16% of cases

3rd qtr: abnormal ST segment & T wave- 7% of cases

4th qtr: abnormal T wave- 4% of cases

Table 2: Distribution of cases according to severity of anaemia in various age group with ECG changes

Age group In years	Cases in Females	Cases in Males	Mild Anaemia		Moderate Anaemia		Severe Anaemia		ECG Changes In females	ECG changes In males
			F	M	F	M	F	M		
< 20	12	12	1	8	5	4	6	0	1	4
20-40	13	13	0	7	5	5	8	1	4	3
40-60	11	14	1	8	4	3	6	3	3	5

This table shows evidence of severe anaemia according to age group was:- <20: 25%, 20-40: 38% & 40-60: 40% of cases. Proportion of moderate anaemia according to age group was:- <20: 41%, 20-40: 38% & 40-60: 32% of cases. Proportion of mild anaemia according to age group was:- <20: 37.5%, 20-40: 27% & 40-60: 36% of cases.

In males proportion of severe anaemia according to age group was:- <20: 0%, 20-40: 7.7% & 40-60: 23% of cases. Proportion of moderate anaemia according to age group was:- <20: 20%, 20-40: 38.5% & 40-60: 30.8% of cases. Proportion of mild anaemia according to age group was:- <20: 66.6%, 20-40: 53.5% & 40-60: 61.5% of cases.

In females proportion of severe anaemia according to age group was:- <20: 50%, 20-40: 61.54% & 40-60: 54.55% of cases. Proportion of moderate anaemia according to age group was:- <20: 41.67%, 20-40: 38.46% & 40-60: 36.36% of cases. Proportion of mild anaemia according to age group was:- <20: 8.33%, 20-40: 0% & 40-60: 9.1% of cases.

ECG changes according to age group were:- <20: 20.8%, 20-40: 27% & 40-60: 32%. So ECG changes were found more in late age group due to deteriorated health with increase in age.

Table 3: ECG abnormalities according to severity of anaemia

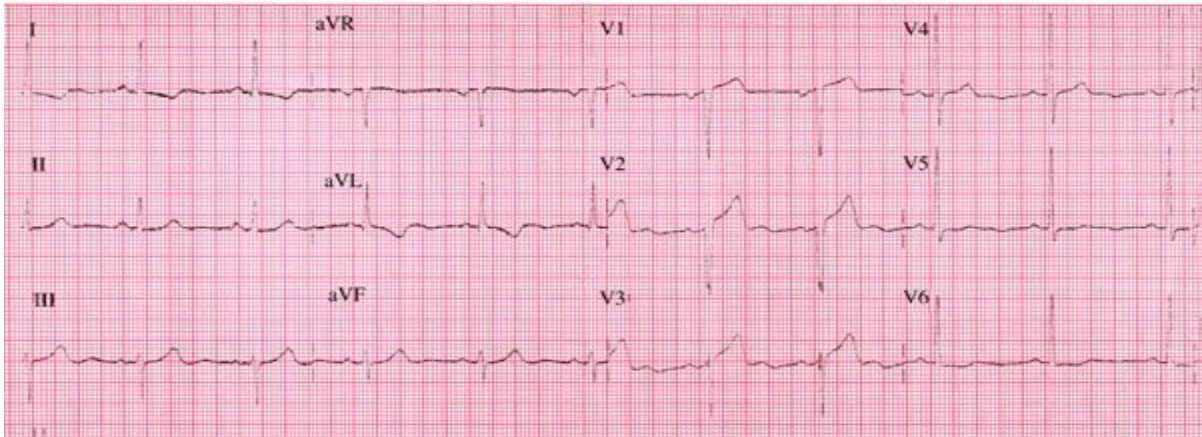
Severity Of anaemia	Total Cases	Cases of Abnormal ECG	St segment			T wave	
			Depression	Elevation	Flat	Inversion	Flat
Mild	25	6	3	-	1	2	1
Moderate	25	6	5	-	-	4	-
Severe	25	8	6	2	-	1	-

Results indicate that ECG abnormalities in mild & moderate anaemia were about in 24% of cases & in severe anaemia about 32% of cases.

Table 4: Statistical value of results

Severity Of anaemia	Abnormal ECG from Study cases	Normal ECG From study cases	Total
Mild	6	19	25
Moderate	6	19	25
Severe	8	17	25

From above table we calculated P value which was 0.50 that is more than 0.05. ECG showing biphasic variation in T wave & ST segment depression.



From 75 study cases tachycardia was found in 8 patients. When we correlated cases of ECG with tachycardia, out of 20 case of ECG changes tachycardia was present in 8 cases.

Discussion

Anaemia is more common in India. Anaemia according to severity, time period & presence or absence of underlying heart disease leads to congestive cardiac failure. So appropriate treatment of anaemia at a time can prevent severe complications. As we have seen in results ECG changes were found in 20 cases out of 75 cases.

In our study we found 17 cases of abnormal ST segment. Abnormality was of three types: ST segment elevation in lead I & II & depression in the rest of the leads, in some cases flattening of ST segment was found.

Next to this was abnormality in T wave. It was of two types: T wave inversion & in some cases flattening of T wave.

The abnormalities found were due to hypoxia of the myocardium. Tachycardia may give rise to this type of pattern in ECG. But in our study in some cases we found abnormalities in ECG even in absence of tachycardia. That suggest the changes were due to hypoxia of the myocardium. Myocardial hypoxia occurred due to decreased oxygen carrying capacity of blood because of decreased Hb concentration. As previously described evidences of ECG abnormalities were little higher in severe anaemia as compared to mild & moderate anaemia.

When anaemia causes hypoxia of myocardium various nonhemodynamic & hemodynamic mechanisms come to play role to compensate for anaemia. Nonhemodynamic mechanism include increased erythropoietin production to stimulate erythropoiesis & increased oxygen extraction. Hemodynamic mechanism include increased cardiac output mediated by lowered afterload, increased preload & positive inotropic & chronotropic effects.

Decreased afterload appeared due to vasodilatation & reduced vascular resistance as a result of decreased blood viscosity, hypoxia induced vasodilatation & enhanced nitric oxide activity. Vasodilatation also include recruitment of micro vessels & in chronic anaemia angiogenesis is stimulated.

Decreased afterload caused venous return(preload) & left ventricular filling pressure to get increase leading to increased left ventricular end diastolic volume & high stroke work. High stroke work is due to enhanced left ventricular contractility as a result of increased concentration of catecholamines & noncatecholamines inotropic factors.

Heart rate is also increased in anaemia due to hypoxia induced stimulation of chemoreceptors & increased sympathetic activity.

In long term these hemodynamic alterations lead to gradual development of cardiac enlargement & left ventricular hypertrophy. The subendocardial layer of the myocardium has to withstand the intraventricular pressure maximum & so it suffers from ischemia the most. It leads to fatty degeneration near this area. So it is clear from this discussion that if anaemia left untreated it may lead to cardiac complications which lead poor prognosis.

Conclusion

In our study we got ECG changes in 27% of anaemic patients. The abnormalities were chiefly due to subendocardial ischemia showing abnormal pattern of ST segment (depression, in some cases elevation & flattening) & T wave (inversion & in some cases flattening) in ECG. Abnormality in ECG was found more in severe anaemia but it was also present in considerable cases of mild & moderate anaemia. So abnormalities of ECG have no correlation with severity of anaemia.

Cardiac enlargement, dilatation & hypertrophy of left ventricle was found particularly when Hb concentration decreased less than 50% of normal.

When we calculated P value it was 0.50 which was more than 0.05 which suggested no significant ECG changes in anaemia.

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11].

EFFECT OF YOGA ON VARIOUS HEAMATOLOGICAL PARAMETERS IN YOUNG HEALTHY INDIVIDUALS

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Abstract:

40 normal young healthy individuals aged between 15-35 years were taken as subjects. They were trained for various types of yoga exercises for 90 days under supervision of professional yoga trainers. Assessment of various haematological parameters like Platelet count, clotting time and bleeding time were done before the training and after the training. After training platelet count and clotting time both were increased while bleeding time was decreased significantly. Data was statically evaluated by student's t test.

Key words: Yoga, bleeding time, clotting time, platelet count

Introduction-

Yoga in India has being reputed to developed remarkable control over bodily functions and it provides one of the best means of self improvement and attaining once full potential. It is a combination of three main parts DHYAN ASANAS and PRANAYAM. This study was carried out to find out the haematological changes in normal young healthy individuals. This study was carried out to evaluate the effect of regular yoga training in young individuals. Medical science tries to achieve an optimum physical and mental health of individual through preventive and curative aspect. In the past curative aspect was more emphasized than preventive. Various studies found that yoga training which is a preventive aspect, having effect on clotting time and blood fluidity which can be preventive for ischemic diseases and it can also affect the platelet count and bleeding time. The impact of yoga training on prevention of cardiovascular and various thrombotic disorders like cerebral ischemic diseases, ischemic heart disease, myocardial infarction is obvious as per the findings of clotting time after yoga, which showed that yoga induce a state of blood hypocoagulability. The bleeding disorder can also be treated with regular yoga practices because the bleeding time was found to decrease after yoga.

Materials and Methods

The present study was conducted on 40 healthy individual's age group between 15-35 years who were normal and attended yoga classes for maintenance of health only. They were attending yoga classes for 90 days in professional yoga centres in Jodhpur city (Rajasthan). Every subject was trained by professional yoga trainer's everyday for one hour in morning.

These subjects were investigated for various haematological parameters like Platelet count, clotting time and bleeding time before and after the training of 90 days. The professional classes had a particular pattern of yoga practices throughout the training. Platelet count was determined by the help of haemogram by automatic cell counter SF-3000 and for haemogram study 2 ml of blood was collected in EDTA vial after aseptic precautions. Bleeding time was observed by laboratory Duke's method. Clotting time was by the Capillary glass tube method.

Observation and Results

Before yoga training the average platelet count was $213.6 \times 10^3 \mu\text{L}$ and after the training it increased to $221.9 \times 10^3 \mu\text{L}$. Platelet count was increased significantly in 35 subjects (87.5%)

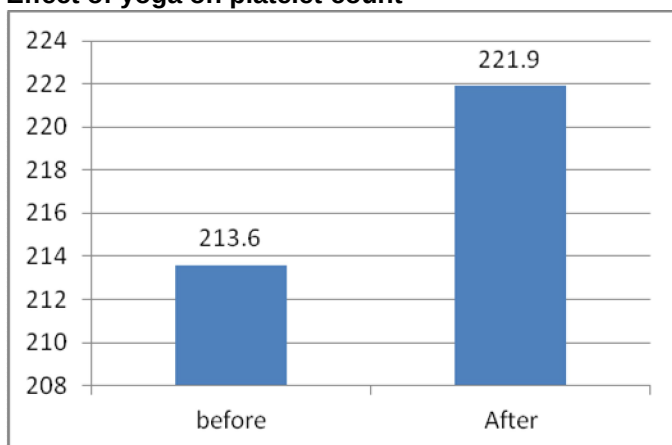
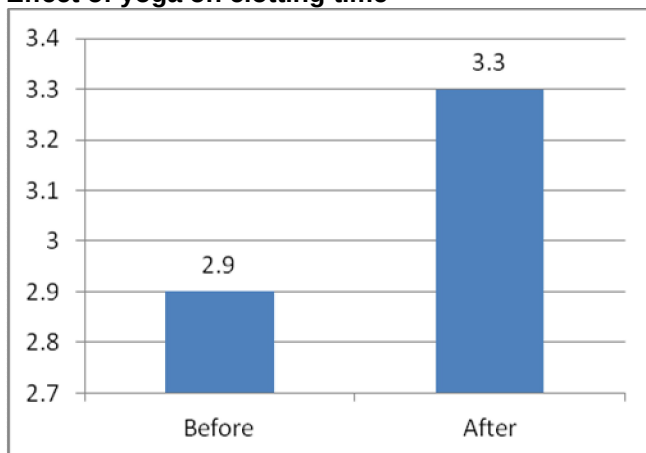
Clotting time was increased in 33 out of 40 subjects. The average Clotting time before yoga was 2.9 minutes and it increased up to 3.3 minute after the yoga. Among 40 subjects the clotting time was found to increase in 33 subjects after the yoga training.

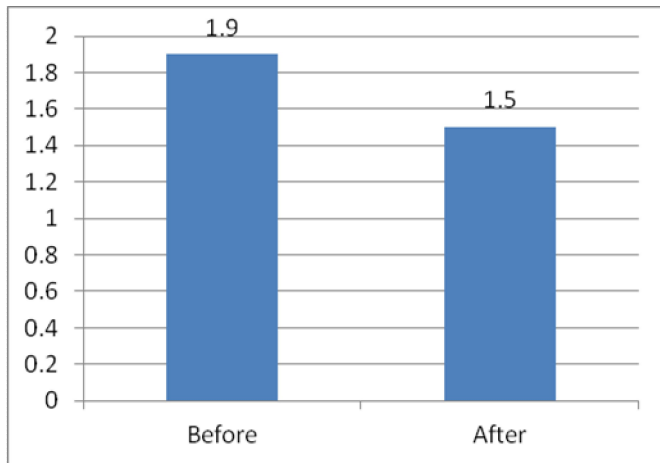
Bleeding time was decreased in 36 out of 40 subjects. The average bleeding time before yoga was 1.9 minutes and it decreased up to 1.5 minute after the yoga. It was decreased in 36 subjects out of 40 means approximate in 90% subjects. Observations are as follows

TABLE 1**EFFECT OF YOGA ON VARIOUS PARAMETERS**

Parameters	Mean before yoga	Mean after yoga
platelet count	213.6x10 ³ µL	221.9x10 ³ µL
Clotting time	2.9 minute	3.3 minute
Bleeding time	1.9 minute	1.5 minute

The graphical representation is as follows

Effect of yoga on platelet count**Effect of yoga on clotting time****sEffect of yoga on Bleeding time**



Discussion

This study was carried out to evaluate the haematological benefits of yoga training in young healthy individuals or in control persons.

As shown in above table among 40 subjects the platelet count was increased in 35, almost in 87.5% subjects. A similar study was carried out by Chohan et al (1984), support our view on platelet count. In their study on 7 previously untrained male adults, there was a rise in platelet count after 4 months of yoga training. The reason for increased platelet count can be explained by two different mechanisms, it may be due to hypoxia induced during yoga practices and second is that yoga practices enhance the contraction of sleep which can release the reserved platelets.

The average clotting time before yoga was 2.9 minute and after training it increased to 3.3 minute. Among 40 subjects the clotting time was found to increase in 33 subjects after the yoga training. A similar study was carried out by Acharya Balkrishna¹ (2007) reported an increase in clotting time in seven subjects after undergoing 4 months of yoga training. The increase in clotting time may be due to decreased fibrinogen level as well due to increase fibrinolytic activity

The effect of yoga on bleeding time was also determined and it was decreased in 36 subjects out of 40 means approximate in 90% subjects. A similar study was carried out by Mehmot Oz. (2003) reported fall in bleeding time in 83.3% of subjects studied after undergoing 60 days of yoga training. The cause of decreased bleeding time is explained on the basis that yoga practices increase the platelet count as well platelet aggregation also.

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ABSTRACT:

Human body is a network of networks. Human dissection features prominently in most medical preclinical courses and uniquely distinguishes medical students from other students of biological sciences. Medical science is a multifaceted discipline.

This study was conducted on 111 students of 1st year of MBBS year 2010-2011 in the department of anatomy, Smt.NHL.Municipal Medical College, Ahmedabad.

KEY WORDS: medical science, human body, 1st year MBBS students, anatomy department.

INTRODUCTION:

Medical science is one of the most interesting and fascinating branch to study. Human body is so complex and unique that at times it defies imagination. The eyes receive approximately 90% of all our information making us basically visual creatures .In 30 minutes the average body gives off enough heat to bring a half gallon of water to boil. In many ways, we humans are similar to other species but in some other aspects, we are unique among the earth's life forms especially in our ability to use language and thoughts. Having evolved a large and complex brain our species has a facility to think, imagine, create and learn from experience .Brain processing power in many aspects beat any super computer.

Medical students get this opportunity to study medical science .It needs great skill and deep interest for meaningful understanding of human body. So we conducted this study to find the main motivating factor for young students to select this career. This will help us to guide them better.

MATERIAL AND METHOD:

This study is conducted in lecture hall of department of anatomy of Smt.NHL.Municipal Medical College, Ahmedabad.

Subject: 111 students of 1st year MBBS year 2010-2011

We provided the subject a list of questions and asked them to give single answer without any influence.

Question was why they want to join M.B.B.S. Is it because, they were interested in medical science or it was because of parental motivation or to help poor or because it is considered noble profession.....

I collected all papers and find out percentage for each reason.

OBSERVATION AND DISCUSSION:

Reason of selecting medical science	% of students said yes	No. of students said Yes
Study human body	2.70	03
satisfaction	4.50	05

Prestige and money	8.10	09
To help poor people	8.10	09
interested	35.14	39
respect	3.60	04
Noble profession	18.02	20
Parent's motivation	2.70	03
Teacher's motivation	1.80	02
Inspired by doctors	2.70	03
No doctor in the family	8.10	09
Don't know	4.50	05

DISCUSSION:

This study is aimed to find basic reason why the young generation getting admitted the medical college and selecting medical science as their career. Is the basic reason is the interest in the science or something else. As at time parental pressure or possibility of enjoying affluent life may also push the students into this career. In the continual process of life, the change is a universal phenomenon. Everything changes but surprisingly the teacher and the taught equation has remained almost static. The human resources development is thriving on the strategy of feedback.

The present study was conducted by taking opinion poll of M.B.B.S admitted students, why they selected this faculty as a career?

In my study I found, 35.14% students said they selected this career because of interest. In the medical college administrators and teachers should create conducive atmosphere so that these students don't loose their interest, rather more no. of students become interested. Good no. Of students (18.02%) joined this profession considering it a very noble profession, that is true also.

Relatively less no. of students is due to teachers and parental motivation. This emphasizes the need of the education and counseling of parents and teachers in this regard.

Unfortunately very less no. of students seemed interested to serve poor and needy people in the society. We also plan to repeat the same study after four and half years for the same batch. This will give us how much their ideas and beliefs change during the stay in the medical college. This will definitely help us to guide better.

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FNAC OF SWELLINGS OF HEAD AND NECK REGION

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Abstract :

FNAC is simple, quick, inexpensive and minimally invasive technique used to diagnose different types of swellings located in the head and neck most commonly originate from cervical lymph node, thyroid, parotid and salivary glands. **Aims:** To assess the frequency of incidences of different sites, age groups, sex and distribution among inflammation and neoplastic lesion.

Material and Methods: A retrospective study was conducted between February 2004 to August 2005. Fine needle aspiration diagnosis was correlated with detail of relevant clinical findings and investigations. Patients between the ages of 1 to 80 years were admitted into the study. A total of 100 patients with a head and neck swelling underwent FNAC. **Results:** Out of 100 fine needle aspiration procedures, 51% were of lymph node, 20% were thyroid, 15% from salivary gland, 08% from soft tissue and 06% were miscellaneous swellings. In Inflammatory swelling(33%), tuberculous lymph node(55%) involvement is common than all other site in the age group of 21 to 30 years (22%) with male preponderance (55%). **Conclusions:** It is concluded that head and neck swellings are very common conditions encountered. Our study found that FNAC is simple, quick, inexpensive and minimally invasive technique to diagnose different types of head and neck swellings. It could differentiate the infective process from neoplastic one and avoids unnecessary surgeries.

Key-words :

Fine Needle Aspiration Cytology (FNAC), Head and Neck Swellings

The evaluation of a neck mass is a common clinical dilemma and a condition to which clinicians routinely encounters. Commonly presenting head and neck masses occur within lymph nodes, thyroid, parotid and other salivary glands. Less common pathologies presenting as neck swellings are from thyroglossal cysts, branchial cleft cysts, carotid body tumours, cystic hygromas, pharyngeal pouch abnormalities and lumps of skin appendages.⁽¹¹⁾ Fine needle aspiration cytology (FNAC) is a simple, quick and cost effective method to sample superficial

masses found in the head and neck⁽¹⁶⁾. The technique is performed in the outpatient department and causes minimal trauma to the patient and carries virtually no risk of complication. Masses located within the region of head and neck including salivary glands and thyroid masses can be readily diagnosed using this technique.^(5,7) In the head and neck region, FNAC is of great value because of the multiplicity of accessible organs and heterogeneous pathologies encountered. An early differentiation of benign from malignant pathology greatly influences the planned treatment.⁽¹⁸⁾ Fine needle aspiration cytology can be performed under local anaesthesia and is particularly useful if a neck lump is thought to be malignant. There is no evidence that the tumour spreads through the skin track created by the fine hypodermic needle used in this technique.⁽¹⁵⁾ FNAC can be both diagnostic and therapeutic in cystic swellings.⁽¹⁾

Fine needle aspiration cytology is helpful for the diagnosis of salivary gland tumours where it can differentiate between a malignant and a benign tumour with over 90% accuracy.⁽⁴⁾ FNAC is particularly helpful in the work-up of cervical masses and nodules because biopsy of cervical adenopathy should be avoided unless all other diagnostic modalities have failed to establish a diagnosis⁽¹⁰⁾. Fine needle aspiration cytology does not give the same architectural detail as histology but it can provide cells from the entire lesion as many passes through the lesion can be made while aspirating⁽⁸⁾. All neck masses should undergo FNAC and culture if necessary.⁽⁹⁾

Material and Methods :

The present study included 100 cases of head and neck swellings performed as outdoor procedure in L.G.General hospital during February 2004 to August 2005. All patients were asked about history related to neck swelling and relevant questions to the etiological cause, present, past and family history of tuberculosis, history of sexual exposure for syphilis and AIDS and other relevant histories.

The palpable swelling was fixed with one hand and the skin was cleaned and 22-23 gauged 3-5 cm long needle with 10ml syringe was inserted into the swelling and a full suction pressure was applied. The tip of the needle was moved around. The pressure was neutralized and the needle was withdrawn. The aspiration material was placed on the glass slides. In all the cases, alcohol fixed smears were made and stained with H & E stains.

Results:

The study included 100 cases among those age ranged from 1 to 80 years in which 55% were male and 45% were female. Maximum incidences observed in the age group of 21 to 30 years and out of 100 cases 82 were below 50 years of age. Among the diagnostic outcome, higher incidences of lesion is in the neck region than in the head region.

Lymph node involvement (51%) is common than other lesion. Incidences of lymph node lesion is higher in male 36 cases (71%) while thyroid lesion is higher in female 16 cases (80%). Among 51 cases of lymph node lesions, 55 % (28 cases) were having tuberculous inflammation, 47% were having inflammatory lesion, 36% were having benign and 17% were having malignant lesions.

Out of 20 cases of thyroid lesion, 45% incidence rate of colloid goitre obtained. Among various salivary gland lesions, benign tumour pleomorphic adenoma is common (60%), and in various soft tissue lesions and miscellaneous lesions lipoma(35%) is common. Other observations are summarized in table 1,2,3.

Table-1
Relation between involvement of organ and sex incidence

Organ involved	Male		Female	
	No.	Percentage	No.	Percentage (%)
Lymph node	36	71	15	29

Thyroid	04	20	16	80
Salivary gland	07	47	08	53
Soft tissues	06	75	02	25
Miscellaneous	02	33	04	67

Table-2
Among 100 cases distribution of inflammatory and neoplastic lesion

Organ involved	Inflammatory	Neoplastic	
		Benign	Malignant
Lymph node	33	04	14
Thyroid	04	15	01
Salivary gland	04	09	02
Soft tissues and Miscellaneous	06	08	-
Total	47	36	17

Table-3
51 cases of various lymph node lesions

Lesions		No. of cases	Percentage (%)
Reactive node		04	08
Inflammatory	Non-specific	05	10
	Tuberculosis	28	55
Metastatic		13	25
Lymphoma		01	02
Total		51	100

Discussion:

In the present study of 100 cases of various head and neck swellings, different data were obtained like age incidence, sex incidence etc. The results achieved in the present study were compared with different studies.

Tuberculous lymphadenitis was found to be the most common pathology in our study accounting for 55% of cases followed by and metastatic carcinoma found in 25% of cases and reactive/non-specific lymphadenitis constituting 18% of cases. El-Hag *et al*⁶ carried out a similar study in Saudi Arabia over a period of five years which included 225 patients. This study was published in 2003 and it showed reactive/non-specific Lymphadenitis to be the commonest cause of neck masses accounting for 33% of cases. Tuberculous lymphadenitis was found to be the next most common pathology constituting 21% of cases followed by malignant swellings found in 13% of cases.

In the head and neck region, lesions are commonest in age group 20-30 years. Males having 10% higher incidences rate than females due to their habit of tobacco chewing and cigarette smoking.

Out of 100 fine needle aspiration procedures, 51% were of lymph node tissue in present study. Also commonest site of malignancy in head and neck region are lymph nodes. Squamous cell carcinoma is one of the commonest tumours in the head and neck region. It usually presents late and with nodal metastasis. Metastatic squamous cell carcinoma is the earliest diagnosis on FNAC. The primary sites are lip, tongue, oral cavity, tonsil, larynx etc.

Table-4
Comparison study of religion of lymphadenopathy with age and sex

Study	Average Age	
	Male	Female
William study 1973-1977 ²	60 years	55 years
Present study	33 years	28 years

Table 4 shows that average age is significantly less in present study as compared to study carried out by William. A reason probably, could be common involvement of lymph nodes by Koch's infection in our country and by secondaries in western countries. As Koch's involves young children and adult quite commonly, it has resulted in reduced average age in present study.

Table-5

Study	No. of cases	
	Male	Female
William study 1973-1977 ²	135	149
Present study	36	15

Table 5 shows incidence of lymphadenopathy was slightly higher in female in William study. While in present study incidence in male gender is higher.

The major salivary glands are developmentally and anatomically closely related to lymphoid tissue. Inflammatory and neoplastic diseases affecting perisalivary lymph nodes enter into the clinical differential diagnosis of salivary gland tumours.⁽¹⁷⁾

Non-neoplastic conditions of the salivary gland that simulate tumour are cystic, sialadenitis, granulomatous disease and benign lympho-epithelial lesions. Most of disorders require medical management or minimal surgical intervention, such as cyst aspiration. Diagnosis by FNAC would clearly reduce the amount of surgery.⁽¹⁷⁾

Pleomorphic adenoma is the commonest tumour of salivary gland. In present study out of 15 cases of salivary gland lesions, 9 cases are of Pleomorphic adenoma. Sometimes well differentiated or low grade mucoepidermoid tumours are diagnosed as Pleomorphic adenoma because of predominance of mucus fluid in aspirate.

Table-6
Comparison study of mucoepidermoid carcinoma

Study	Percentage
Michael et al study ¹²	35%
Present study	14%

Table 6 shows commonest malignancy in the salivary gland tumour is mucoepidermoid carcinoma. The greatest application of thyroid FNA is the nonsurgical alternative provided in the investigation of goitre. Thus eliminating the need for a purely diagnostic thyroidectomy. Additionally, the method may serve a therapeutic function since the evacuation of fluid in cystic lesions may be followed by involution of lesion.

Most common cellular element of thyroid smears is usually the follicular cells, but spindle shaped stromal elements as well as small number of lymphocytes and macrophages are also part of the normal cell population.⁽¹⁴⁾

Table-7

Comparison study of relationship of thyroid lesions with age and sex

Study	Maximum Incidence (Years)	Female: Male Ratio
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Charry et al 1980 ³	20-40	4:1
Prasad et al 1992 ¹²	30-50	5:1
Present study	20-30	4:1

Table 7 shows that maximum incidences of thyroid swellings was found during age 20-30 years while in Charry study, maximum incidence between 20 and 40 years. In Charry study and in present study female: male ratio was 4:1 while in present study it was 5:1. Female preponderance in various thyroid lesions is comparatively well observed in present study.

Conclusion :

The present study confirmed that FNAC of lymph nodes is an excellent first line method, for investigating the nature of the lesions. It is an economical and convenient alternative to open biopsy of lymphnodes. The study strongly indicate that the tuberculosis is the most common cause of cervical lymphadenopathy. No complication is recorded during the study with FNAC.

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Case report:

SHIGELLA FLEXNERI ISOLATE FROM 5 YEAR OLD MALE CHILD IN L.G. HOSPITAL.

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Head****

Shigellosis still remains a public health problem in most developing countries because of the poverty, poor sanitation, personal hygiene and poor water supply. Shigella is a major cause of morbidity and mortality among children in the developing countries. Though, oral rehydration is the principle means of management, effective antimicrobial therapy reduces both its severity and duration. Emergency of resistant to ampicillin and trimethoprim-sulphamethoxazole in 1980s led to the use of nalidixic acid (NA) as the first line drug for shigellosis. However, increasing number of Shigella isolates are showing resistance to NA and other quinolones leading to a therapeutic problem. The numbers of multiresistant strains are increasing regularly not only in different parts of country, but also world wide.

Stool sample was collected from 5 year old child admitted in pediatric ward with chief complaint of increase frequency of foul smelling stool containing pus and blood almost 8-10 times a day. High grade fever with chills was associated. Patient had taken outside food before 2 days. Stool sample was transported immediately for culture and parasite examination. Parasitic infestation was ruled out. The specimen was inoculated on Nutrient agar, MacConkey agar, Salmonella-Shigella agar. Suspected colonies of shigella were subjected to gram stain, motility and biochemical test using triple sugar iron medium, citrate medium, urease medium, phenyl pyruvic acid medium, indole production, amino acid utilisation test (lysine, arginine, ornithine), sugar fermentation (glucose, sucrose, mannitol, lactose). The susceptibility of isolated shigella to different antibiotic were determined by Kirby-bauer's disk diffusion technique as per CLSI guidelines. The antibiotic used were Ampicillin, Co-trimoxazole, Chloramphenicol, Nalidixic acid, Ciprofloxacin, Levofloxacin, Gatifloxacin, Ofloxacin, Ceftriaxone and Ceftazidime.

Shigella flexneri strain was isolated. It was resistant to Ampicillin, Co-trimoxazole, Chloramphenicol and Nalidixic acid. No resistance were observed in Ciprofloxacin, Levofloxacin, Gatifloxacin, Ofloxacin, Ceftriaxone and Ceftazidime. Patient was improved with Levofloxacin for 5 days. Stool sample was collected after two days for culture in which Shigella was not isolated.

Periodic analysis and reporting of antibiotic susceptibility is an important measure to guide antibiotic treatment for Shigellosis. Antibiotic may not be necessary for mild cases and if required should be guided by local data or antibiotic susceptibility report. The continuous surveillance and antibiotic susceptibility test is very important to know the changing antibiotic susceptibility pattern as well as cyclic change of the group from time to time as resistant pattern also change with type change in group. Antibiotic susceptibility test is important in proper therapy of Shigellosis.

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Review Articles

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REVIEW OF DREAM PHYSIOLOGY

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Ahmedabad 380008 ; **we dream to find out why we dream.**

Abstract:

Since centuries man kind is curious about dream. Dream has given all type of emotions from sorrow, joy to enlightenment including some great discoveries. Man kind had considered dream as divine messages to curse. In last century Freud and many other psychologist and psychoanalysts has given good insight in theories of sleep and applied in psychotherapies. Even today some psychologists are using such theories in psychotherapy . With the advancement in polysomnographic recording and functional MRI scanning of brain ,we know that dreams occur mainly during REM type of sleep. Majority of REM sleep is associated with dreams but we hardly remember them .If we wake up the volunteer during REM sleep, usually the subject will witness that he/she was in dream. Polysomnographic recording and functional MRI scanning recording during REM sleep and dream are same as person is awake and perform particular task. Only difference is person is not conscious and has no control over it. So so many questions are raising i.e. what is consciousness? , what are functions/ purposes of dreams?. One thing is sure that if we remember dream the dream can have potential to do some impact on our life i.e. our emotions, thinking and behaviors/actions depending upon age, sex, genetic make ups, personally of an individual. The impact can be positive or negative .Though the majority of situation the effects are neutral. It has been suggested that the genetics determine neuronal connection of brain and the dream make variability in interconnections i.e. some connections are strengthen or weaken during dreams. And the variability/ variation is basis of evolution. So dreams appears to be ultimately for evolutionary benefits and progress of human species. Recently lots of researches are going on lucid dream i.e. dreams are induced consciously and used for human potential development and progress. In near future more researches will reply the brain mechanics of dream. The dreams are very subjective in nature the dreams are still mysterious to us .In the article current concepts and various theories of dreams has been elaborated to facilitate researches on dreams.

Defining dream:

Dictionary defines a dream as 'a train of thoughts, images, or fancies passing through the mind during sleep'. Truly dreams are much more accurately described as experiences that is events that one has personally encountered during sleep. But this does not define the dreams that they were we know but we can't recollect. Sometimes dreams are remembered but majority of time they are forgotten. Some time dreams may leave some glimpses of images in mind.

Since civilization human being always remained curious about dream. Even upon the advancement in science and technology many questions pertaining dream are still unanswered and remain mysterious. Interestingly dream has played significant role in literature, philosophy and religion – as divine messages, creative inspiration, prophecies, or keys to hidden desires. Many have also dismissed them as nonsense as Francis Bacon wrote in his essays in 1625: 'Dreams and predictions of astrology... ought to serve but for winter talk by the fireside'

Story from science

Friedrich August Kekulé von Stradonitz is a remarkable figure in the history of chemistry, specifically organic chemistry. Kekulé – Dreamed of Molecular structure of Benzene ring that led to major discoveries in organic and bio chemistry. And that helped a lot to pharmacology and medical sciences also. Kekulé discovered the tetravalent nature of carbon, the formation of chemical/ organic "Structure Theory", but he did not make this breakthrough by experimentation alone. He had a dream! As he described in a speech given at the Deutsche Chemische Gesellschaft (German Chemical Society): "I fell into a reverie, and lo, the atoms were gamboling before my eyes! Whenever, hitherto, these diminutive beings had appeared to me, they had always been in motion; but up to that time, I had never been able to discern the nature of their motion. Now, however, I saw how, frequently, two smaller atoms united to form a pair; how a larger one embraced the two smaller ones; how still larger ones kept hold of three or even four of the smaller; whilst the whole kept whirling in a giddy dance. I saw how the larger ones formed a chain, dragging the smaller ones after them, but only at the ends of the chain. . . The cry of the conductor: "Clapham Road," awakened me from my dreaming; but I spent part of the night in putting on paper at least sketches of these dream forms. This was the origin of the Structural Theory." Later, he had a dream that helped him discover that the Benzene molecule, unlike other known organic compounds, had a circular structure rather than a linear one... solving a problem that had been confounding chemists: "...I was sitting writing on my textbook, but the work did not progress; my thoughts were elsewhere. I turned my chair to the fire and dozed. Again the atoms were gamboling before my eyes. This time the smaller groups kept modestly in the background. My mental eye, rendered more acute by the repeated visions of the kind, could now distinguish larger structures of manifold conformation; long rows sometimes more closely fitted together all twining and twisting in snake-like motion. But look! What was that? One of the snakes had seized hold of its own tail, and the form whirled mockingly before my eyes. As if by a flash of lightning I awoke; and this time also I spent the rest of the night in working out the consequences of the hypothesis." The snake seizing its own tail gave Kekulé the circular structure idea he needed to solve the Benzene problem!

Said an excited Kekulé to his colleagues, "Let us learn to dream!"

Theories of dream:

Psychoanalytic Theory of Dreams:

Freud

At first, Freud used hypnotic suggestion to get at the unconscious trying to induce a dreamlike state in his patients. According to Freud, every dream has meaning and carries a message

manifested by unconscious processes. The content of the dream is a metaphor for some disguised, or rather repressed, wish of the consciousness. In order to interpret a dream, one has to reason backwards in a process of interpretation known as “free association” (this method is still practiced in modern psychoanalysis. According to Freud the dreams are royal road of unconscious mind.

Freud thought that the function of dreams was to allow the release of repressed thoughts and impulses which cause excitation in neural activity. The force which causes dreams to occur was, in all cases, an unconscious and instinctual wish. The only way that the wish could be subdued is by the release of the “nervous energy” that was caused by it. Therefore in terms of Freud all dreams must contain a necessarily meaningful message.

Today newer physiological theory that dreams are not triggered by psychological factors, such as repressed desires or wishes, but rather by a purely biological process - REM sleep. We can no longer infer that wishes play a role in dreams because they do not spur dreams. If taken further, we can no longer assume that every, or any dream for that matter, has any significant meaning.

Carl Jung theory

According to Jung's theory, the psyche is made up of three parts: the ego or conscious mind; the personal unconscious, which includes memories that spring easily to mind as well as those that have been repressed for various reasons; and the collective unconscious – a kind of reservoir of human experience that influences all human behavior ; particularly emotional behaviors, and includes recognition of some key symbols and myths. As with Freud. The dream was a tool in uncovering the hidden realms of the psyche and resolving emotional and other problems.

Fritz Perls

Fritz Perls, is founder of gestalts therapy. Perls was interested in the emotions, but, rather than linking dreams to repressed memories, he focused on his patients' immediate situation. His aim was to restore a sense of wholeness to people he believed had been separated from uncomfortable thoughts, sensations and emotions. He got patients to act out their dreams and to comment on their emotions as they were doing so. The ensuing dialogue between dreamer and the dream object they were acting out aimed to break down the barriers holding the patient back from self-discovery.

Calvin Hall

According to Calvin Hall' theory, dreams express 'conceptions' of the self, family, friends and social environment, and the frequency of certain elements of dream reflects waking concerns. His research on people around the world showed remarkable similarities between dreams, and long-term follow-ups of patients revealed great consistency in their dream content, with any changes reflecting alteration in their waking life. This continuity between dream content and waking thought was so marked that hall felt he could predict a dreamer's behaviour and lifestyle through analysing the contents of their dreams.

Dream body theory

Eugene Gendlin and Arnold Mindell,[1960] suggested **Dreambody theory** which integrates dreams, the body and meditation. Mindell argues that 'all body problems, all body symptoms are dreams trying to manifest through the body' and that accurately following the way of nature' and amplifying the signals from dreams brings awareness of the patterns on which we structure our lives, including those which are painful and which we may have repressed.

Roll of Consciousness

Consciousness Model and dream

Consciousness is a simplified model of yourself constructed by your brain from the best available sources of information. During waking, the model is derived from external sensory input, in combination with internal contextual,

During sleep, in the absence of external input, consciousness model is constructed from internal biases only. As the most difficult problem in study of dreams is they highly subjective experiences and not remember and not repeatability or sometime deportability, The fact that we remember our dreams they appear conscious rather than unconscious mental processes. In dream, we live through our dreams as much as our waking states .So dreaming is particular organization of consciousness. So we one more level of consciousness i.e. unconscious, consciousness of external environment and, dream consciousness. So far as cognition function is concern there is no difference between dream and waking state. Only difference is there no conscious control over dream. English physician and writer, Havelock Ellis, said: 'Dreams are real while they last. Can we say more of life?

Computer metaphor theory:

The theory uses a computer metaphor to interpret the dreams. According to this theory, dreams serve to 'clean up' clutter from the mind, much like clean-up operations in a computer, refreshing the mind to prepare for the next day . Dream served the same function as the scan disk on a computer, preparing the brain for the day ahead or processing the events of the day before into the memory database.

Psychotherapy theory: This theoretical model suggests that dreams function as a form of psychotherapy.

In this theory, the dreamer is able to make connections between different thoughts and emotions in a safe environment.

Contemporary model

A contemporary model of dreaming combines some elements of various theories. The activation of the brain creates loose connections between thoughts and ideas, which are then guided by the emotions of the dreamer.

'We dream to forget' theory

. Biologists Francis Crick and Graeme Mitchison caused as stir in 1983 when they argued in the journal nature that 'we dream to forget'. Their view was that dreams are the unnecessary and harmful detritus of the overload from everyday life, and REM sleep is kind of bin man of the mind. It was found that sleepers could recall dreams most frequently if they were awakened when their eyes appeared to be moving rapidly beneath their eyelids.

Physiological Theory

In recent years, the focus of research has oriented more towards the physiological basis of dream. Sleep laboratories have been developed, where patients can be viewed in controlled conditions and tests performed to show how the body undergoes the same reactions to dream images as to waking reality. Another development has been brain-imaging technology and polysomnography; The results suggest that the brain is just as active during REM sleep as when awake.

We all know that there are two kinds of sleep: NREM [Non rapid eye movement sleep] sleep an energy-conserving state known as associated with growth, repair and restoration, a relaxed body and a brain on idle, and REM [Rapid eye movement sleep] or paradoxical sleep .REM sleep is associated with rapid eye movements and muscular twitches, a Paralyzed body, a highly activated brain and dreaming .EEG wave are usually low voltage frequency B wave of alertness. Although REM sleep is not the only sleep state in which people can dream, it provides the optimal conditions for vivid dreaming-It is a state described as switched-on brain in a switched off body. The distribution of REM sleep across development and in the course of a night provides a clue to the most important functions of this sleeping state. REM sleep is at its maximal level perinatally and in the last weeks of prenatal development when the brain is growing its vast networks of neural circuitry. The percentage of REM sleep gradually drops off throughout childhood, but REM sleep does not completely disappear when brain growth stops at adulthood, implying that REM sleep may serve another function. The fact that REM sleep gradually increases across the night, reaching a maximum as the time of waking approaches, suggests that it may prepare our brains for waking action; a sort of brain tune-up. these recurrent activations every ninety minutes or so throughout the night may also help consolidate memory and new learning.

Evolution theory:

Even if dreaming has no special biological function, dreams themselves may play a specific role. They may, for example increase variability in the nervous system. Darwinian evolution requires a variable population, a selective pressure and a means of reproduction of successful variations.

Activation-Synthesis Model of dream:

Two Harvard University scientists –

Drs. Allan Hobson and Dr Robert McCarley developed a new model of dream i.e r
Activation-Synthesis Model,

The dreaming is caused physiologically by a “dream state generator,” which is located in the brain stem. It is “on” during REM sleep, while all sensory input and motor output are blocked, and the neurons in the cerebral cortex are activated by random impulses that generate sensory information within the nervous system. As Hobson and McCarley put it: “the activated forebrain then synthesizes the dream out of internally generated information, trying its best to make sense out of the nonsense it is being presented with.” They stated that “the motivating force for dreaming is not psychological but physiological since the time of occurrence and duration of dreaming sleep are quite constant, suggesting a preprogrammed, neutrally determined genesis .

The “bizarre features” of a dream world are simply a reflection of the bizarre state (the bombardment with internal expiatory signals, etc.) of the dreaming brain. That is, in the construction of a dream “the forebrain may be making the best of a bad job in producing even a partially coherent dream imagery from the relatively noisy signals sent up to it from the brain stem.” Hobson’s and McCarley’s notion that “dreams were after all merely senseless, random accompaniment of the autonomous electrical activity of the sleeping Central Nervous System” does not provide all the pieces of the broken mirror puzzle.

Hobson hypothesis that the likely function of dream is to construct and to test the brain circuits that underlie our behavior - including cognition and meaning attribution." Another words, dreaming is a mechanism intended to stimulate the neural circuits and this stimulation must in some way be critical to normal brain functioning during the awake state.

Lucid dreaming.

Another development is research on conscious dreaming techniques, such as that carried out by Stephen LaBerge's Lucidity Institute. The institute as shown through controlled clinical studies that people have the ability to stay conscious during sleep. Though the concept has generated some controversies among scientists concept is that sometimes while dreaming, we consciously notice that we are dreaming. This clear-sighted state of consciousness is referred to as lucid dreaming. Here vividly experiencing a dream world that can appear astonishingly real. In the late 1970s laboratory research at Stanford university proved that lucid dreams did in fact occur during unambiguous sleep. Based on earlier studies showing that some of the eye movement of REM sleep corresponded to the reported direction of the dreamer's gaze, we asked lucid dreamers to carry out distinctive patterns of voluntary eye movements when they realized they were dreaming. The prearranged eye movement signals appeared on the polygraph records during uninterrupted REM sleep, proving that the subject had indeed been lucid during sleep.

Lucid dreaming also offers considerable potential for a variety of other applications. These include aiding self development, enhancing self confidence, overcoming nightmares, perhaps improving mental health, facilitating creative problem solving and opening the mind to the possibilities of higher development. Some interesting conclusion of lucid dream institute are lucid dreaming is a learnable skill, it takes time and effort. With 'Mode-A' of this emerging 'oneirotechnology' is the Nova Dreamer®, a biofeedback device that give cues during REM Sleep reminding users that they are dreaming. New, increasingly effective lucidity induction devices are under development, bringing closer the dream of a personal world simulation for everyone.

The case of lucid dreaming, which is the state of dreaming while knowing that you are dreaming , also shows that there is more to the story than what the Activation-Synthesis Model can offer. Lucid dreaming has been proven to occur due to technology which lets people signal through electrodes attached to corners of their eyes (by prearranged eye movements) when they realize that they are dreaming . If dreams were simply a result of the forebrain "making the best of a bad job in producing even partially coherent dream imagery from the relatively noisy signals sent up to it" from the brain stem, then how could a person know that they are dreaming, be able to exercise volatile choice in a lucid dream, or carry out a previously planned course of action in a dream.

As is evidenced, dreaming has both physiological determinants as expressed by Activation-Synthesis Model, as well as psychological determinants. These two factors are played out in astonishingly unique ways in each individual. Therefore, it is hard to believe that the same symbol that appears in the dreams of two different people actually means the same thing, if anything at all. The brains of two people are extremely different; not only due to genetic differences but also due to their relation to the external world (the experiences of each person are very unique). The other fact that adds to this uniqueness is how each of their brains uses the input of genes and experience to synthesize the dream world.

Ernest Hartmann, a former president of the association for the study of dreams, based on his work on trauma patients, suggested that the role of dreams is to weave new experience into the memory and increase the connections between events. This would fit in with work on infants that suggests that nightmares set in at the toddler stage when children have amassed enough of a memory bank to create connections.

Another development has been the central position accorded to dreams in the emerging science of consciousness.

Dreams have long been regarded as a wellspring of inspiration in nearly every field, from literature to science, engineering, painting, music and sport. As we had seen August Kekulé's dream of a snake biting its own tail, to take just one example, inspired his discovery of the previously unsuspected ring structure of benzene. Creativity of the dream state might be brought within our conscious control by means of lucid dreaming. However, we are still a long way from understanding the mysteries of the dream physiology. The function of dream is to "calming a storm" or reducing a disturbance, and a longer term function relating to memory—not so much consolidating memory but rather cross-connecting, weaving in something new, increasing the connections.

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15] Work of Dr B F Skinner

REINFORCEMENT THEORY:

After conducting the research on training pigeons, Skinner developed the Skinner Box. It was a device with which animal learning behavior could be strictly controlled and measured. His studies guided him towards the concept that the learning process is basically a matter of stimulus and is rewarded, or reinforced, response.

REINFORCING STIMULI THEORY:

Skinner agreed to the method of reinforcement because it is necessary for learning. For Skinner, reinforcement was a fact and nothing more certain events, following the occurrence of a response, would alter the frequency of that response.

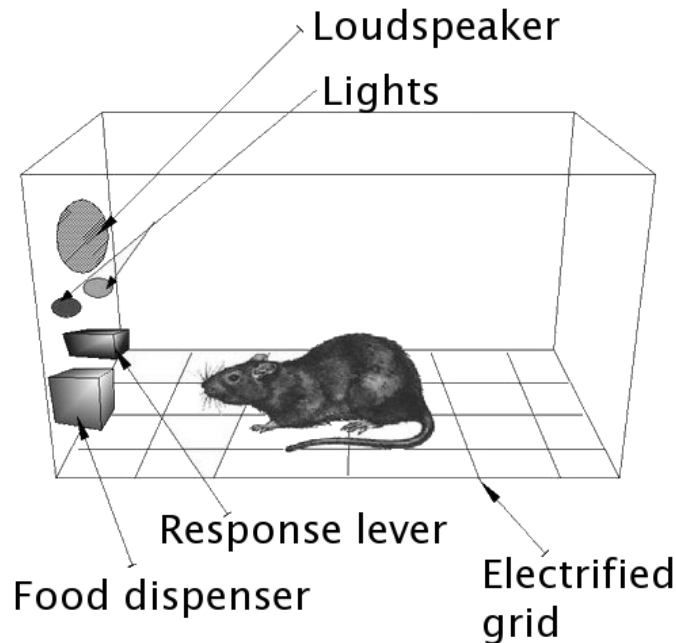
B F Skinner's entire system is based on operant conditioning. The organism is in the process of operating on the environment. In other words, it is bouncing around its world, doing what it does. During this, the organism is encountering a special kind of stimulus called a reinforcing stimulus. This special stimulus has the effect of increasing the operant. This is operant conditioning. The behavior is followed by consequence and the nature of the consequence modifies the organism's tendency to repeat the behavior in the future.

To explain the theory, Skinner made a special cage. It is known as Skinner Box. This box has a bar on one wall that, when pressed, causes a little mechanism to release a food pellet into the cage.

The rat in the cage bounces around. When he accidentally presses the bar, a food pellet falls

into the cage .Following this experiment Skinner discovered Schedules of Reinforcement.

SHAPING THEORY



SKINNER has worked on Question how we acquire more complex sort of behavior. He responded with the idea of shaping the method of successive approximations. He used shaping on one of his daughters who was three or four years old, and was afraid to go down on a particular slide. He picked her up, put her at the end of the slide and asked, if she could jump down. She did .He then picked her up and put her a foot or so up the slide. She was asked to jump again. She again jumped .He repeated this again and again. Eventually he succeeded . She could slide all the way down and jump off. The same method was used in the systematic desensitization. It was

invented by Joseph Wolpe, a behaviorist

AVERSIVE STIMULI THEORY

It is the opposite of a Reinforcing stimuli theory.

A behavior followed by an aversive stimulus results in a decreased probability of a behavior recurring in the future.

If you spank a child for throwing his toys, he will throw his toys lesser and lesser.

If you remove an already active aversive stimulus after a rat or a child performs a certain behavior, yours is being negative reinforcement . Skinner explains

Behavior allowed by removal of an aversive stimulus results in an increased probability of that behavior recurring in the future.

OPERANT BEHAVIOUR THEORY

Behavior is affected by its consequences .This process is not trial and error learning . It can be explained with an example.

A hungry rat is placed in a semi soundproof box for several days bits of food are occasionally delivered into a tray by an automatic dispenser.

A small horizontal section of a lever has been resting in its lowest position, when the rat touches it, it moves downward. In doing so, it closes an electric circuit and operates the food dispense. Immediately after eating the delivered food, the rat begins to press the lever rapidly. The behavior has been reinforced by a single sequence . The rat was not trying to do anything when it first touched the lever and it did not learn from an error.

To a hungry rat, food is a natural reinforcer. In this example, the sound of the food dispenser is a re inforcer.

The sound of that one operation of the dispenser would have had an observable effect even though no food was delivered on that time .When food no longer follows pressing the lever, the rat eventually sops pressing it . The behavior is said to have been extinguished.

Human species is distinguished by the fact that its vocal responses can be easily conditioned. As

operant behavior is shaped and maintained by its consequences for the individual. Behavior is what an organism is doing or more accurately what it is observed by another organism to be doing. It is more to the point to say that behavior is that part of the functioning of an organism which is engaged in commerce with the outside world. Skinner's experimental analysis of operant behavior has led to a technology called behavior modifications.

CRITICS OF HIS THEORIES

Skinner believed that psychology should be the science of behavior. This belief had both supporters and detractors.

Derek E Blackman was one of his supporters. He believed that Skinner provided a Bridge between psychology as a biological science and psychology as a social science.

Micheal Wessels was a detractor of Skinner's argument. He criticized Skinner's argument by saying that nearly all of Skinner's prescriptions are problematic in one respect or another and his view of philosophy encounters serious objections.

CONCLUSION OF HIS CONTRIBUTION

B F Skinner was one of the great behaviorist. His theoretical papers on why psychology should be the science of behavior, have had a particular effect. He compiled all his ideas to form his theory of behaviorism.

He believed that through the science of behavior, one can assess and control the behavior of an organism as well as a human being. His experimental theories have proved that improved behavior can be used as a tool to create better society.

16]

World Health Day 2011

Antimicrobial resistance: no action today, no cure tomorrow

Combat drug resistance:

Statement by

WHO Director-General, Dr Margaret Chan 6 April 2011

World Health Day 2011

Urgent action necessary to safeguard drug treatments

When the first antibiotics were introduced in the 1940s, they were hailed as "wonder drugs", the miracles of modern medicine. And rightly so. Widespread infections that killed many millions of people every year could now be cured. Major diseases, like syphilis, gonorrhoea, leprosy, and tuberculosis, lost much of their sting. The risk of death from something so common as strep throat or a child's scratched knee virtually vanished.

The powerful impact of these medicines sparked a revolution in the discovery of new drugs. The human condition took a dramatic turn for the better, with significant jumps in life expectancy.

The message on this World Health Day is loud and clear. The world is on the brink of losing these miracle cures.

The emergence and spread of drug-resistant pathogens has accelerated. More and more essential medicines are failing. The therapeutic arsenal is shrinking. The speed with which these drugs are being lost far outpaces the development of replacement drugs. In fact, the R&D pipeline for new antimicrobials has practically run dry.

The implications are equally clear. In the absence of urgent corrective and protective actions, the world is heading towards a post-antibiotic era, in which many common infections will no longer have a cure and, once again, kill unabated. The implications go beyond a resurgence of deadly infections to threaten many other life-saving and life-prolonging interventions, like cancer treatments, sophisticated surgical operations, and organ transplantations. With hospitals now the hotbeds for highly-resistant pathogens, such procedures become hazardous.

While hospital “superbugs” make the biggest headlines, these especially deadly pathogens are just the extreme expression of a much broader, and more disturbing picture.

The development of resistance is a natural biological process that will occur, sooner or later, with every drug. The use of any antimicrobial for any infection, in any dose, and over any time period, forces microbes to either adapt or die in a phenomenon known as “selective pressure”. The microbes which adapt and survive carry genes for resistance, which can be passed on from one person to another and rapidly spread around the world.

This natural process has been vastly accelerated and amplified by a number of human practices, behaviours, and policy failures. Collectively, the world has failed to handle these fragile cures with appropriate care. We have assumed that miracle cures will last forever, with older drugs eventually failing only to be replaced by newer, better and more powerful ones. This is not at all the trend we are seeing.

Faulty practices and flawed assumptions have clearly made the inevitable development of drug resistance happen much sooner, rather than later. For some diseases, like malaria, our options are very limited as we have only a single class of effective drugs - artemisinin-based combination therapies - with which to treat more than 200 million falciparum cases each year. Although new drugs are under development, especially through the Medicines for Malaria Venture, a public-private partnership, early signals of artemisinin resistance have already been detected.

Similarly, gains in reducing child deaths due to diarrhoea and respiratory infections are at risk. And, while TB deaths are declining, in just the past year nearly half a million people developed multidrug-resistant TB, and a third of them died as a result. These are just a few of the stark warnings that must be heeded.

The responsibility for turning this situation around is entirely in our hands. Irrational and inappropriate use of antimicrobials is by far the biggest driver of drug resistance. This includes overuse, when drugs are dispensed too liberally, sometimes to “be on the safe side”, sometimes in response to patient demand, but often for doctors and pharmacists to make more money.

This includes underuse, especially when economic hardship encourages patients to stop treatment as soon as they feel better, rather than complete the treatment course needed to fully kill the pathogen. This includes misuse, when drugs are given for the wrong disease, usually in the absence of a diagnostic test.

In many countries, this includes a failure to keep substandard products off the market, to ensure that antimicrobials are dispensed only by a licensed prescriber, and to stop over-the-counter sales of individual pills.

And this includes the massive routine use of antimicrobials, to promote growth and for prophylaxis, in the industrialized production of food. In several parts of the world, more than 50% in tonnage of all antimicrobial production is used in food-producing animals. In addition, veterinarians in some countries earn at least 40% of their income from the sale of drugs, creating a strong disincentive to limit their use. The problem arises when drugs used for food production are medically important for human health, as evidence shows that pathogens that have developed resistance to drugs in animals can be transmitted to humans.

On this World Health Day, WHO is issuing a policy package to get everyone, especially governments and their drug regulatory systems, on the right track, with the right measures, quickly. Governments can make progress, working with health workers, pharmacists, civil society, patients, and industry. We all can plan and coordinate our response. We can expand surveillance efforts. We can improve drug regulatory and supply systems. We can foster improved use of medicines for human and animal health. We can actively prevent and control infections in health services and beyond. And, we must stimulate a robust pipeline for new antimicrobials, diagnostics and vaccines.

Drug resistance costs vast amounts of money, and affects vast numbers of lives. The trends are clear and ominous. No action today means no cure tomorrow. At a time of multiple calamities in the world, we cannot allow the loss of essential medicines – essential cures for many millions of people – to become the next global crisis.

The end

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