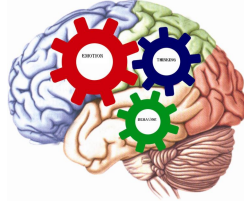


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EDITOR: DR. JANARDAN V. BHATT,

POST BOX NO. 1 2 0 2 8 P A L D I POST OFFICE,

AHMEDABAD - 380 007. GUJARAT INDIA.

email: ijabms@gmail.com , soham2007@yohoo.com ,

websites: <http://www.themedicalacademy.in> ,

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History of physiology and medicine

WHO :MESSAGE ON WORLD HEALTH DAY 7 April 2012

EDITORIAL

ANIMAL and animal alternative in medical education Innovative methods

Dr. Sadhana M Joshi , Dr Janardan V Bhatt

When we were in total dark, the animal experimentation in the field of research was of great importance as, when no other alternatives were available. We can't deny the fact that animal research of those times have given birth to a number of important discoveries & inventions & helped a lot in medical advances of today.

The history of animal experiments goes back to Galen, a physician in 2nd century who dissected pigs & goats, & is known as "father of vivisection"

In 1242, Ibn al-Nafis provided accurate description of blood circulation in mammals. & a more complete description was later provided by William Harvey in 17th century. We still remember Ivan Pavlov's experiments on dogs to understand classical conditioning in 1890.

The list is long & many of researches & achievements have become land marks in many different fields of medical science.

But that is about genuine researches & genuine scientists & in the times, when no other alternatives were available.

But in present scenario, the things are different. Now a day's numbers of better animal alternatives are available which are faster, economical, informative & more advanced.

Animal experimentation & researches can be done for a few selected fields only, where no alternatives are available & where there is absolute requirement of animal experiments only.

As such we use animals mostly in three fields of medical science--

- (1) Medical education.
- (2) Product testing.
- (3) Scientific & clinical research.

Test done on animals include-acute toxicity & chronic toxicity tests. Out of these two tests most criticized are Draize test & LD50 test.

Alternative methods to animal testing fall into three categories.

1. Replacement

2. Reduction
3. Refinement

Replacement alternatives:

Total replacement method –e.g. Pregnancy tests, Relative replacement-by using “synthetic skin” called Corrositex. Computer modeling & “virtual reality” devices can replace animal testing in medical education. Technologies like MRI & ultra sound also in clinical investigation. New DNA chip technology, Acoustic microscopy, Research using stem cells, the Human Genome Project, pharmacogenomics etc. are emerging technological fields that will help medical advances. Virtual dissections can replace animal dissections.

Reduction alternatives:

Improved statistical design, sharing research animals, etc. The Murine Local

Lymph Node Assay (LLNA) is another newly accepted test in product safety

Assessment is another example of reduction & refinement alternatives.

Refinement alternatives:

It covers anything that serves to reduces pain & distress of animals & enhance

Their well-being. It includes giving animal good cages, companions & natural

environment. Giving medication for pain during & after test, etc.

Why animal testing should be stopped in present scenario?

Live & let live.

Animal testing should be stopped for many reasons—

- It is totally inhuman & cruel to kill animals or give them lots of pain, terror & distress.
- Experimenting on animals is an unethical practice that exploits one species for the supposed (but doubtful) benefit of another.
- Animal experimentation is also a scientifically invalid practice, because data from animal studies cannot be reliably applied to humans.

- Because animals are different from humans in a number of significant ways, they make inaccurate models for studying human disease, thereby sidetracking medical progress and wasting time, talent and resources.
- By using Xeno-transplantation & transgenic animals in research, we are increasing dangers to public health & safety by enabling dangerous infectious diseases and viruses to cross the species barrier and spread diseases among the human population.
- By using animals like frogs & others, we disturb eco-balance.
- It is a million dollar business on the name of research for no. of pharmaceutical co., academic institutions, academic journals, adverting co., media, etc.
- Some scientists favor animal experimentation because they can make research easily on animals & make research papers.
- Why to use animals when newer, more economical, faster, more informative & more advanced alternatives are available?
- We should stop using animal tested products, oppose animal testing, & support animal saving programmes.

But definitely these new non-animal alternatives should be properly validated before put in practice otherwise they can cause serious human damage.

In nutshell Since many years we in medical education were using animals in medical education. We were using frogs, rabbits, dogs... for experimental purpose in medical education. With the strict implementation of "Prevention of animal cruelty act 1960 [PAC]" and there subsections ,the animal supporting activists supporting the PAC ACT make a campaign against using the animals in medical education. And we have virtually stopped experiments on animals in medical education. The animal experiments are essential part of medical education as animal and human being have similar kind tissues and textures. So it was a smart idea that before handling the human being, doctor are being well trained on handling animals' tissues. PAC act are also not totally against our animal experiments ,but they feel that we are handling animals improperly .So We have ultimately stopped using animal in major sections of medical education .To make the medical education more effectively, we

jointly have think to develop animal alternatives .In this context if we need to review make our selves aware of Prevention of animal cruelty act 1960 and it subsection and associated provisions and also be aware of CPCSEA guidelines [Committee for the purpose of control and supervision of experiment on animals].CPCSEA is committee formed by central government and published guideline for practicing good laboratory practice. CPCSEA also published a standard operating procedure SOP for Institutional Animal ethics committee IAEC. Animals are very effective and efficient tool in medical education and research. Right now it is a state of dilemma .In Medical education, laboratories of physiology and pharmacology departments are full of instruments meant for animal experimentation and research. In this context we have to be more innovative to develop new alternative methods of experimentation and research. In this field, the knowledge of animation, digital and multimedia ,computer science and technology is going to be very useful to name some i.e. digital animals, virtual animals, digital laboratory and .so on
URL: <http://www.frame.org.uk/>

URL <http://www.sheffbp.co.uk/sbpmain.htm>

With Special thanks Ref: Speech by Dr Rajeev sharma Asso. prof.
Dept of Physiology ,GGS Medical College, Faridkot (Punjab

ORIGINAL ARTICLES:

1

THE MORPHOMETRIC STUDY OF THIRD VENTRICLE AND DIENCEPHELON BY COMPUTERISED TOMOGRAPHY

Dr. PRITEE MESHAM

Assist. Professor, Department of Anatomy, LTMMC & GH, Sion, Mumbai

Dr. SHANTA HATTANGDI

Professor & HOD, Department of Anatomy, LTMMC &GH, Sion, Mumbai

Abstract: Aims of this morphometric study was to analyze the size of third ventricle in relation to the dimension of diencephalon in humans. Ventricular size

of males and females was compared. Changes in normal ventricular size with the corresponding changes in the dimension of diencephalon during ageing was also studied and statistically analyzed. The CT images of 112 adult individuals (Age Group 21-60) and 88 ageing individuals (Age above 61) was studied in both males and females. This study suggests that there is negative co-relation of age with dimensions of diencephalon and diencephalon volume is reduced with age. Also there is positive co-relation of age with dimensions of third ventricle and the volume of the third ventricle is enlarged with physiologic ageing.

Key words - Diencephalon (thalamus), Third ventricle, CT images.

Introduction

Structure of human brain is complicated and not yet fully understood. As human brain ages, characteristic structural changes occur that are considered normal and are expected. According to Schochet¹³ (1988) as ageing occurs the brain undergoes many gross and histopathologic changes with regression of the brain tissue leading to the enlargement of the ventricles. CT has provided revolutionary means for morphologic study of the brain in vivo. Majority of CT studies suggests that diencephalon volume is reduced and the volume of the third ventricle is enlarged with physiologic ageing.

Aims and Objectives

1. Aims of this morphometric study is to analyze the size of third ventricle and the dimension of diencephalon (thalamus) in humans.
2. To compare third ventricular size of males and females.
3. To correlate the changes in normal third ventricular size and corresponding changes in the dimension of diencephalon during ageing.

Materials and Methods

This was the prospective study of 12 month duration in which CT images of 112 adult individuals (Age Group 21-60) and 88 ageing individuals (Age above 61) of either sex attending department of Radiodiagnosis for brain CT was studied. The CT scanner used in the study was "SIEMENS SOMATOM VOLUME ZOOM MULTI SLICE (4 SLICE) MULTI DETECTOR SPIRAL CT SCANNER" with a scan time of 1-10 sec and slice thickness of 4mm. Measurement of third ventricle and diencephalon(thalamus) was made by using dicomworks software.

Analysis of Image

Measurement of third ventricle and diencephalon (thalamus)

- Greatest height in cms
- Greatest anterior-posterior extent in cms, for third ventricle the anterior-posterior extent was measured from column of fornix to pineal gland and for diencephalon from anterior pole of thalamus to pulvinar
- Greatest transverse diameter in cms, maximum transverse distance along the horizontal axis

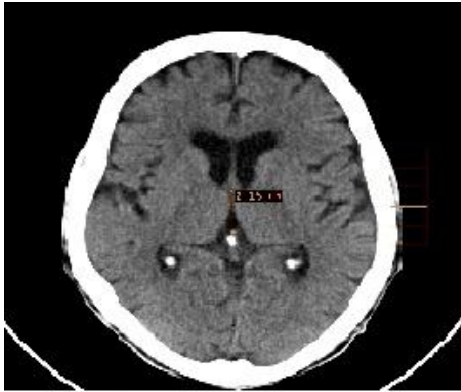


Fig1. Measurement of Third ventricle: Anterior-posterior diameter



Fig2. Measurement of Third ventricle: Transverse diameter



Fig3. Measurement of Diencephalon (Thalamus): Anterior-posterior diameter

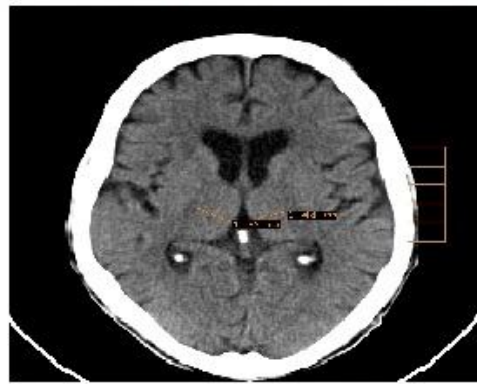


Fig4. Measurement of Diencephalon (Thalamus): Transverse diameter

Results

Table 1: Comparison of morphometry of third ventricle and diencephalon (thalamus) in males and females age 20-60 years

Samples	Female Aged 20-60 yrs			Male Aged 20-60 yrs		
	Minimum	Maximum	Mean	Minimum	Maximum	Mean
T1	1.50	2.50	1.990	1.50	2.50	2.008
T2	1.44	3.26	2.418	1.28	3.16	2.420
T3	0.20	1.45	0.573	0.32	1.30	0.726
D1	1.00	2.00	1.500	1.00	2.00	1.491
D2	2.42	3.61	3.018	2.70	3.67	3.105
D3	1.03	1.78	1.422	0.77	1.88	1.415

Table 2: Comparison of morphometry of third ventricle and diencephalon (thalamus) in males and females age above 60 years

Samples	Female Aged Above 60 yrs	Male Aged
---------	--------------------------	-----------

				Above 60 yrs			
Type	Type	Minimum	Maximum	Mean	Minimum	Maximum	Mean
T1	T1	1.50	2.00	1.880	1.50	2.50	1.945
T2	T2	1.80	3.21	2.517	1.98	3.18	2.534
T3	T3	0.51	1.38	0.799	0.53	1.29	0.843
D1	D1	1.00	1.50	1.369	1.00	1.50	1.347
D2	D2	2.56	3.32	2.890	2.46	3.46	2.960
D3	D3	1.12	1.55	1.360	1.20	1.54	1.421

Discussion:

THIRD VENTRICLE

Studies by Gawler⁸ et al in 1976, Brinkman et al in 1981 and Soininen⁹ et al in 1982 found that the maximum transverse diameter of the third ventricle was 0.46 cms, 0.59 cms and 0.92 cms respectively with higher values in males. In the present study all the three dimensions of third ventricle were studied. The mean greatest height of third ventricle in males was 2.008cms (SD 0.26) which was found to be greater than in females 1.99 cms (SD 0.28) which was statistically not significant in males and statistically significant in females. The greatest height of third ventricle showed positive correlation with age in both. The mean greatest anterior-posterior diameter of third ventricle was larger in males 2.47 cms (SD 0.326) than in females 2.46 cms (SD 0.33) which was statistically not significant in both and showed positive correlation with age in both. The mean greatest transverse diameter of the third ventricle was more in males 0.77 cms (SD 0.21) than in females 0.67 cms (SD 0.25) which was statistically significant in both and showed positive correlation with age in both.

DIENCEPHALON (THALAMUS)

Schwartz M¹¹. et al showed that in the elderly the volumes of the thalamus is reduced. In the present study the mean greatest height of diencephalon in males was 1.42 cms (SD 0.222) which was found to be greater in females 1.44 cms (SD 0.218) which was statistically significant and showed negative correlation with age in both.

The mean greatest anterior-posterior diameter of diencephalon was larger in males 3.04 cms (SD 0.22) than in females 2.96 cms (SD 0.21) which was statistically significant and showed negative correlation with age in both.

The mean greatest transverse diameter of diencephalon was more in males 1.42 cms (SD 0.12) than in females was 1.39 (SD 0.12) which was statistically significant in females and statistically not significant in males and showed negative correlation with age in both.

Conclusion

- 1) The dimensions of third ventricle increases with age in both males and females. The increase was more in individuals with age above 60 years than individuals with age 20-60 years and more in males than in females.
- 2) The dimensions of diencephalon decreases with age in both males and females. The decrease was more in individuals with age above 60 years than individuals with

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2 PREVALENCE OF RESTRICTIVE LUNG DISORDERS IN AUTO RICKSHAW DRIVERS.

Type : Original Article

Title: Prevalence of restrictive lung disorders in auto rickshaw drivers.

Authors

Sudhir Gavali¹, (Brig.) Ratan Singh², J.S Kharche³ , A. Pranita⁴ .

1,3,4 : Assistant Professor , Physiology.

2, Professor , Physiology

Contribution of each Author:

SUDHIR GAVALI : Data collection, Statistical Analysis ,Design of study, Reference Work, Writing of the manuscript

Dr.M.K.Parekh , Dr.J.S.Kharche *: Data collection,, Edited manuscript

Dr.A.R.Joshi Dr..B.Balsubramaniyan**** : Writing & editing the manuscript

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Dept of Physiology Bharati Vidyapeeth University Medical College, Dhanakawadi Pune 43. (INDIA) for technical help.

Conflict Of Interest : No

Abstract:

Long term exposure to the traffic air pollution is associated with decrease in lung function and increase in respiratory disorders. Traffic air pollution includes a list of pollutants but the major being particulate matter, sulfur dioxide, oxides of nitrogen, ozone, lead and carbon monoxide. Professional vehicular drivers who spend 8-10 hours daily in traffic pollution are at higher risk of restrictive lung disorders. Long term exposure to ozone produces mainly pulmonary fibrosis which could be associated with decrease in FVC, FEV1. Carbon monoxide (CO) is one of the major pollutants and has been associated

with restrictive type of lung diseases. Present study was conducted to assess the prevalence of restrictive lung diseases amongst the open cabin auto rickshaw drivers. Forced vital capacity (FVC), forced expiratory volume (FEV1), FEV1/FVC %, and peak expiratory flow rate (PEFR) of 100 auto rickshaw drivers were recorded as per all the standard norms. These readings were compared with 100 healthy, non drivers, working in offices.

Results: The auto rickshaw drivers showed significant reduction in FVC ($P < 0.01$), FEV1 ($P < 0.05$) and PEFR ($P < 0.05$) where FEV1/FVC% did not show any significant change ($P > 0.05$). Conclusion: The above findings are suggestive of restrictive lung disorders.

Key Words: Auto rickshaw drivers Traffic air pollution
Restrictive lung disorders

INTRODUCTION

The World Health Organization (WHO) states that 2.4 million people die each year from causes directly attributable to air pollution (1). Number of deaths and cases of respiratory diseases due to air pollution are increasing worldwide and is a major concern of the developed world and the developing nations (2,3).

Worldwide more deaths per year are linked to air pollution than to automobile accidents. Direct causes of air pollution related deaths include aggravated asthma, bronchitis, emphysema, lung and heart diseases and respiratory allergies.

Air pollution is a chemical, particulate matter, or biological agent that modifies the natural characteristics of the atmosphere. The complex, dynamic, natural gaseous system of the atmosphere is essential to support life on Earth (4).

Pune is one of the most rapidly growing metropolitan cities of the country. The growth is associated with about 300 new motor vehicles being added per day in Pune district and also the increased industrial growth in and around the city (5). An increase in the migrant population that uses fossil fuel for the domestic use also adds to already rising pollution in the city.

The contribution of motorized traffic to air pollution is widely recognized. There is a list of pollutants known to us but the major pollutants include particulate matter $< 10 \mu\text{m}$ in size, sulfur dioxide, oxides of nitrogen, ozone, lead and carbon monoxide (3). The ambient air quality monitored in the vicinity of traffic junctures in Pune city by "Maharashtra Pollution Control Board" (6) showed intermittent increase in respirable Suspended Particulate Matter (RSPM) and oxides of nitrogen (NOx). While the ambient level of sulfur dioxide (SO_2) was well below average. The maximum level of RSPM at residential area reached to $190 \mu\text{g}/\text{m}^3$ as compared to the normal being $100 \mu\text{g}/\text{m}^3$ and the maximum level approached by NOx was $336 \mu\text{g}/\text{m}^3$ as

compared to normal value of $80\mu\text{g}/\text{m}^3$. These values are 100% to 400% higher as compared to maximal permissible levels.

Drivers of non air conditioned vehicles are affected more than air conditioned vehicle drivers (7). Several studies have shown a deterioration of ventilatory lung function in people who are constantly exposed to air pollution (8,9). Professional drivers e.g. auto rickshaw drivers, taxi drivers etc, who spend a lot of time in the traffic are at higher risk to respiratory diseases. In the recent past the problem of air pollution has occupied a prime position because many studies have shown that the air pollution is directly responsible for the increase in hospital admissions for respiratory disorders (10). So it is not surprising that lot of studies have been carried out to assess the effect of air pollution on pulmonary function tests

Auto rickshaws are open cabin type of vehicles and their drivers who spend minimum 8 hours daily in traffic pollution are likely to be more affected than general population. This study has been designed to evaluate ventilatory lung functions in a selected group of auto rickshaw drivers of Pune city.

MATERIALS AND METHODS

The study was carried out in the Department of Physiology, of Bharati Vidyapeeth Medical College in Pune. The subjects selected were 100 auto rickshaw drivers (Group I) who had been driving auto rickshaws of open cabin type for more than 5 years and for more than 8 hours daily in Pune city. A group of another 100 individuals (Group II) who were normal citizens, not auto rickshaw drivers, working in offices for 8 hours or more and minimally exposed to traffic pollution was also selected as a control group. The height, weight and age of the study group were well matched with the control group. Both the study group and control group were non smokers, not suffering from any cardio respiratory ailments and between the age group of 25-45 years.

All the subjects were explained the experimental protocol before the start of study. The data including a detailed history, standing height of each individual was measured and expressed in centimeters to the nearest 1 centimeter, weight in kilograms was recorded. Although the procedure of spirometry does not involve any invasive procedure nor any life threatening risk, written consent was however taken before the procedure and it was a fully voluntary study.

Ventilatory lung functions were recorded on a Computerized portable "Schiller SP-1" lung function unit, the automated flow Spirometer with a sensor, converts the air flow into digital signals and gives direct readings

of all parameters recorded. Test readings were recorded at noon time(11), as expiratory flow rate is highest at noon. All the readings were taken in standing position. Subjects were properly instructed regarding the test prior to the actual performance. Properly fitting disposable mouthpieces and nose-clips were provided. Three readings were taken and best of three readings was selected.

The parameters selected on Spirometer for the study were ,Forced vital capacity (FVC) (in Liters). Forced expiratory volume in one second (FEV1) (in Liters). The percentage of forced expiratory volume in one second to forced vital capacity (FEV1/FVC%) .

The readings were automatically compared by the inbuilt predicted pulmonary function norms in the spirometer for the Indian population depending upon the age, sex, height and weight. Peak Expiratory Flow Rate (PEFR) was recorded by using “Vitalograph” peak flow meter made in Ennis Ireland. The volunteer was asked to inspire maximally and then expire as fast and as forcefully as possible into the flow meter. Highest of three such expiratory flow efforts was recorded and expressed in L/minute and compared with predicted norms for Indian population (12). The standard Algorithm and Miller’s Diagnostic Quadrant was used for categorizing spirometric results (13). Statistical analysis was done by using SPSS software for statistical analysis. The significance was calculated by ‘Z’ test where the ‘Z’ value more than 1.96 was considered to be significant. The ‘p’ value <0.01 was considered to be highly significant and <0.05 was considered to be just significant. The ‘p’ value >0.05 was considered to be not significant.

RESULTS

The age in years, weight in kilograms and height in centimeters in mean \pm SD of groups were: Group I (auto rickshaw drivers) age 35.93 ± 5.83 , height 166.51 ± 5.41 and weight 70.21 ± 10.69 where in Group II (non auto rickshaw drivers) age 33.8 ± 6.15 , height 163.25 ± 9.34 and weight 67.4 ± 9.12 .

Table I shows the mean FVC of the group I (2.94 ± 0.58 L) when compared with the mean FVC of the group II (3.27 ± 0.33 L) showed highly significant reduction ($p < 0.01$). The mean FEV₁ recorded in group I was 2.67 ± 0.51 L which showed statistically significant reduction but for p value at < 0.05 as compared to control group whose mean FEV₁ was 2.91 ± 0.34 L however the FEV₁/FVC % did not show statistically significant change. Table II shows statistically significant reduction of PEFR, 480.8 ± 22.14 in Group I but for p value at < 0.05 as compared to the PEFR, 491.7 ± 17.41 in Group II (control group).

Table – 1: Comparison of pulmonary functions between Study group I and Control group II.

Parameters	Group II (Control)	Group I (Study Group)	P Value	Significance
	Mean ± SD (n=100)	Mean ± SD (n=100)		
FVC (L)	3.27 ± 0.33	2.94 ± 0.58	< 0.01	HS
FEV ₁ (L)	2.91 ± 0.34	2.67 ± 0.51	< 0.05	S
FEV ₁ /FVC %	89.93 ± 7.09	90.47 ± 4.89	> 0.05	NS

HS : Highly significant

S : Significant

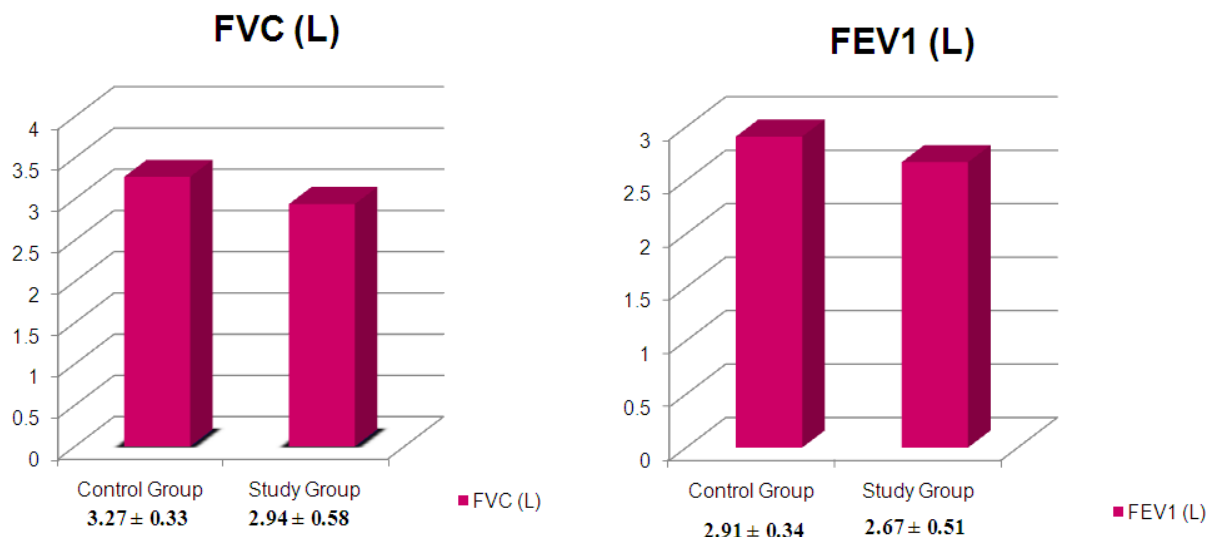
NS : Not significant

Table – 2: Comparison of PEFR between Study group I and Control group II.

Parameters	Group II (Control)	Group I (Study Group)	P Value	Significance
	Mean ± SD (n=100)	Mean ± SD (n=100)		
PEFR (L/min)	491.7 ± 17.41	480.8 ± 22.14	< 0.05	S

S : Significant

Comparison of FVC and FEV1 between study group and control group



DISCUSSION

In the present study we recorded FVC, FEV₁, FEV₁/FVC %, and PEFR of 100 auto rickshaw drivers and compared with the control of 100 individuals (non auto rickshaw drivers) from the general public who were height, weight and age matched with the auto rickshaw drivers. FVC reduction was highly significant in the study Group I whereas FEV₁ showed slight statistically significant reduction, but FEV₁/FVC% did not show reduction. On the contrary, FEV₁/FVC% in study group depicted in Table I showed slight increase in Group I. This could be because the numerator FEV₁, was not significantly reduced as compared to denominator FVC which was significantly reduced. The PEFR values though slightly reduced in the group I were near lower limit of the normal predicted values.

The auto rickshaw drivers are exposed to motor vehicle exhaust both from diesel and petrol machines along with other pollutants already existing on roads. Long term exposure to pollutants have been associated with decrease in lung function and increase in respiratory symptoms (14).

Sources of air pollution especially in urban areas are industrial complexes, power plants and automobiles. The pollutants present in the ambient air which are harmful to human health have been identified by numerous studies. Particulate matter less than 10 µm in size (PM₁₀), Particulate matter less than 2.5 µm in size (PM_{2.5}), Oxides of sulfur (SO_x), Oxides of nitrogen (NO_x), Ozone (O₃), Lead (Pb), Carbon monoxide (CO) comprise bulk of the traffic pollution (1,3).

Oxides of nitrogen present in the ambient air cause injury in the terminal bronchioles, decrease the pulmonary compliance and reduce the vital

capacity (15). The extremely high ambient concentration of coarse particulate matter less than 10µm in size (PM10) was strongly associated with significant reduction in pulmonary function (16). The study of effect of ozone on rat lungs, showed strong association between long term exposure to ozone and restrictive type of lung disease and appeared to have occurred due to stiffened lung without overt fibrosis (17). Tropospheric ozone is an oxidant air pollutant formed from oxides of nitrogen and volatile organic compounds in the presence of sunlight (18). Long term exposure to ozone produces mainly pulmonary fibrosis(19) which could be associated with decrease in FVC.

Carbon monoxide (CO) is one of the major pollutants and the toxic effects of CO(20) on respiratory muscles cause muscle weakness in both expiratory muscles and inspiratory muscles leading to restrictive as well as obstructive lung diseases.

Unleaded fuel has reduced the level of lead in the ambient air. Lead causes structural damage and impairs the functions of the lung(21). Many studies (22, 23) have reported that airborne iron was possibly associated with a decline in PEFR as iron in airborne particles was known to cause oxidative damage.

Ultra fine particles with diameters 0.005-1µm get deposited on alveolar walls and in the nuclei of the cells by diffusion and retained in lung parenchyma. These small sized particles are responsible for oxidative stress and mitochondrial damage probably because of their smaller size, larger surface to volume ratio and ability to penetrate into the cell interior and localize near mitochondria (24). The oxidative stress mediated by particles may arise from direct generation of Reactive Oxygen Species (ROS) from the surface of the particles or from soluble compounds carried by these particles such as polyaromatic hydrocarbons. Oxidative stress might up regulate redox sensitive transcription factor via nuclear factor kappa - B (NF-κB) in airway epithelial cells thus increasing the synthesis of pro inflammatory cytokines and resulting in cell and tissue injury (25).

In our study we dealt with the vehicular fuel exhaust pollution as a whole and no attempt was made to identify individual pollutants and feel that all the pollutants namely PM, SO₂, NO_x, O₃ etc. act in tandem and cause structural damage to the lung there by causing reduced compliance and various other tissue changes leading to a restrictive pattern of pulmonary dysfunction.

In conclusion the findings of the study suggest that air pollution does adversely affect the ventilatory lung function on chronic long term exposure to traffic air pollution with prevalence of restrictive type of lung disorder. Although some of the parameters were significantly altered in some subjects, suggesting a restrictive type of disorder were apparently asymptomatic. The lungs have large functional reserve and the person will become symptomatic only when the lung functions are diminished markedly. A large sample and longitudinal study in this field will definitely be of a greater value in predicting the relationship between traffic pollution and ventilatory lung function .

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EVALUATION OF PULMONARY FUNCTION TESTS IN NORMAL PREGNANT (II & III TRIMESTER) & NON PREGNANT WOMEN

FIRST AUTHOR:

Name : Dr. Lata Gupta

Designation :
Associate Professor

Department Address :
Department of Physiology,
G.M.E.R.S. Medical College, Sola,
Ahmedabad.

CO AUTHOR:

Name : Dr. R. Dixit

Designation :
Deputy Director – Medical Education

Department Address :
Health, Medical Services and Medical Education,
'G' Block, Civil Hospital,
Gandhinagar.

CORRESPONDING AUTHOR:

Name : Dr. Lata Gupta

Designation :
Associate Professor
Department Address :
Department of Physiology,
G.M.E.R.S. Medical College, Sola,
Ahmedabad.
Correspondence Address:
Email dr_lata@rediffmail.com

ABSTRACT

Pregnancy is principally a phenomenon of maternal adaptation to the increasing demands of the growing fetus¹. Pregnancy causes many visible and invisible changes in human body and it represents one of the best example of selective adaptation in terms of respiratory physiology.

BACKGROUND:

To evaluate the changes in dynamic pulmonary function tests (PFTs) in IInd & IIIrd trimesters of pregnancy and compare the results between normal pregnant women (case group) & normal non pregnant women of IInd & IIIrd trimesters (control group).

DESIGN (MATERIAL & METHOD):

50 Subjects were divided into two groups, non pregnant women (n = 20, mean age = 26.5 ± 2.69) and normal pregnant women's of II & III trimesters (n = 30, mean age = 24.84 ± 3.00). PFTs were done by medspiror.

RESULTS :

Significant decrease in all the parameters of PFTs like Forced Vital Capacity (FVC), Forced Expiratory Volume in one second (FEV₁), Peak Expiratory Flow Rate (PEFR), Maximum Ventilation Volume (MVV), were seen in II & III trimester of normal pregnant women as compared to normal non pregnant women.

CONCLUSION :

Our data suggests that there is alteration in PFTs in pregnant women. Continuous Monitoring of PFTs may prove to be of great value in maternal healthcare as cases of restriction and obstruction in lungs during pregnancy can be identified early and its deterioration can be prevented by proper management.

KEY WORDS :

PFTs

Pregnancy

EVALUATION OF PULMONARY FUNCTION TESTS IN NORMAL PREGNANT (II & III TRIMESTER) & NON PREGNANT WOMEN

INTRODUCTION:

Pregnancy causes many visible and invisible changes in human body. The highly efficient and sensitive respiratory system becomes vulnerable with profound changes during pregnancy where adaptability is a key feature to combat stress, anxiety and

fear resulting in altered performance of systems to need demands¹.

Pulmonary function tests (PFT_s) permit an accurate and reproducible assessment of the functional state of respiratory system and allow quantification of the severity of disease.

Various investigators^{4,11} have studied pulmonary function tests (PFT_s) during normal pregnancy but their results were conflicting. Out of various pulmonary function tests medspiror assess FVC, FEV₁, PEF_R, MVV, etc.

The scanty literature on pulmonary function testing during pregnancy has prompted the present work.

MATERIAL AND METHODS :

About 50 subjects were examined for PFTs. In this linear study groups, 30 pregnant women were taken for case study and 20 normal female were examined for PFTs for control study. About 30 female pregnant patients belonging to the 20-30 yrs of age volunteered themselves for the present study belonging to middle socio economic status and come for regular check up in hospital as OPD basis. Young healthy normal non pregnant women of child bearing age (20-30 yrs) from medical faculty and also from those who accompanied the case subjects were selected for control group.

General physical examination of the subject including required anthropometric measures such, as height, weight and chest circumference was noted. Resting body temperature resting pulse rate, and Blood Pressure were taken in sitting postured after half an hour of rest for every time when they come for pulmonary function testing.

Anthropometric measures such as height, weight was noted. In standing posture, during late morning session, after taking consent and explained the procedure to the subjects and they were asked to take maximum deep inspiration then blow out with maximum effort in mouth piece of medspiiror which already apposed between the lips firmly. Nose was closed by nose clips. As two reading for PFTs were taken on instrument and the highest one selected for calculation.

The instrument was fed with the data, height in centimeters age in years, weight in Kilograms, sex and room temperature prior

to performance of a FVC maneuver. The specifications of Instrument provides flow rate L/Sec versus volume (L) plot and provides volume verses time plot recordings on thermo sensitive paper.

Results of PFTs displayed and recorded as follows :

Capacity	FVC – Forced Vital
Expiratory Volume in one second	FEV1 – Forced
Flow Rate	PEFR – Peak Expiratory
Ventilation Volume	MVV – Maximum

The actual values as measured during the maneuvers, predicted values for the specific patient, when compared to others of same age, height, sex or percentage predicted values, i.e. a ratio of actual value and predicted value expressed as percentage are displayed and if resources available printed records can be obtained.

The PFTs data's are examined by medspiror and a diagnosis of obstructive or restrictive disease is made and there are a number of systems which used to determine the severity of disease. Here is just one way that is very commonly used¹¹.

- Normal PFT outcomes : >85% of predicted values**
- Mild Disease : >65% but <85% of predicted values**
- Moderate Disease : >50% but <65% of predicted values**
- Severe Disease : <50% of predicted values**

If both FVC and FEV₁ are normal, then patient has a normal PFT tests. If FVC and/or FEV₁, is 80-90 % or higher, then patient has restricted lung disease. If the % predicted for FEV₁/FVC is 69% or lower, then the patient has an obstructed lung disease.

RESULTS AND OBSERVATION:

Statistical analysis was done for all parameters undertaken in study along with some investigative parameters. The age ranged between 20-30 yrs in both groups.

The figures of range have been rounded off, **second & third trimesters are abbreviated as II, III respectively in all tables &**

graphs. Percentage difference (% diff) for increase or decrease in any parameter was calculated, considering the mean values of controls (non pregnant subjects) as baseline when compared with the case group (two different trimesters).

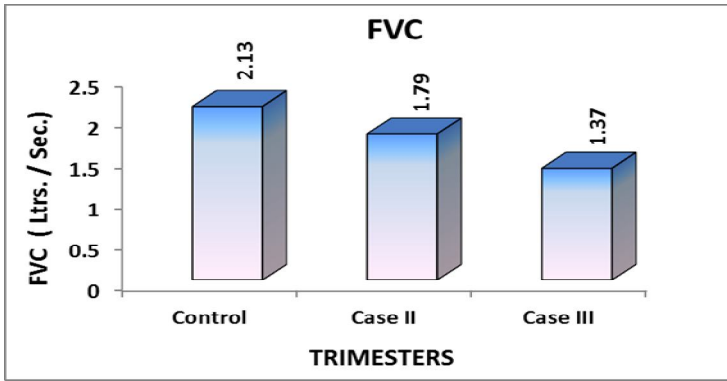
On comparing control versus second trimester and third trimester, mean values of control were taken as baseline. Mean values of second trimesters were considered 100%, when this group was compared with third trimester group. The positive value in percent difference depicts the increase and negative value as the decrease for that parameter.

Unpaired 't' test by OS 3 programme (computer), was done to find the level of significance as number of control subjects is differ from the number of case group. . That were significant when these respiratory parameters of different of pregnancy were compared trimesters with each other and with non pregnant state (Control group). The calculated 't' values and corresponding 'p' values are given for various sample groups for all the respiratory parameters.

TABLE - 1
STATISTICAL ANALYSIS FOR FORCED VITAL CAPACITY (Lt/Sec.) IN DIFFERENT CONTROL AND IN II & III TRIMESTER OF PREGNANCY

Sample	Mean	±SD	Range	% difference	't' values	'p' values	Significant
Control vs II	2.13 1.79	0.21 0.50	0.78- 3.26	-15.9	-2.842	0.0068 (<0.0)	NS
Control vs III	2.13 1.37	0.21 0.49	0.66- 2.34	-35.6	-6.466	0.0000	HS
II vs III	1.79 1.37	0.50 0.49		-23.4	3	0.0043 (0.005)	S

GRAPH -1 GRAPHICAL REPRESENTATION OF FVC (Lt/Sec.) IN CONTROL AND IN II & III TRIMESTER OF PREGNANCY



Decrease in forced vital capacity from second trimester to third trimester is less significant while decrease in FVC from control to third trimester is highly significant.

TABLE - 2
STATISTICAL ANALYSIS FOR FORCED
EXPIRATORY VOLUME IN ONE SECOND FEV₁ (Lt/Sec.)
IN CONTROL AND IN II & III TRIMESTER OF PREGNANCY

Sample	Mean	±SD	Range	% difference	't' values	'p' values	Significant
Control vs II	1.96 1.57	0.23 0.41	0.70- 2.28	-19.8	3.797	0.0005 (<.001)	S
Control vs III	1.96 1.23	0.23 0.45	0.52- 2.24	-37.2	6.589	0.0001	HS
II vs III	1.57 1.23	0.41 0.45		-21.6	2.793	0.0075 (<0.01)	LS

GRAPH - 2 GRAPHICAL REPRESENTATION OF FEV₁ (Lt/Sec.) IN CONTROL AND IN II & III TRIMESTER OF PREGNANCY

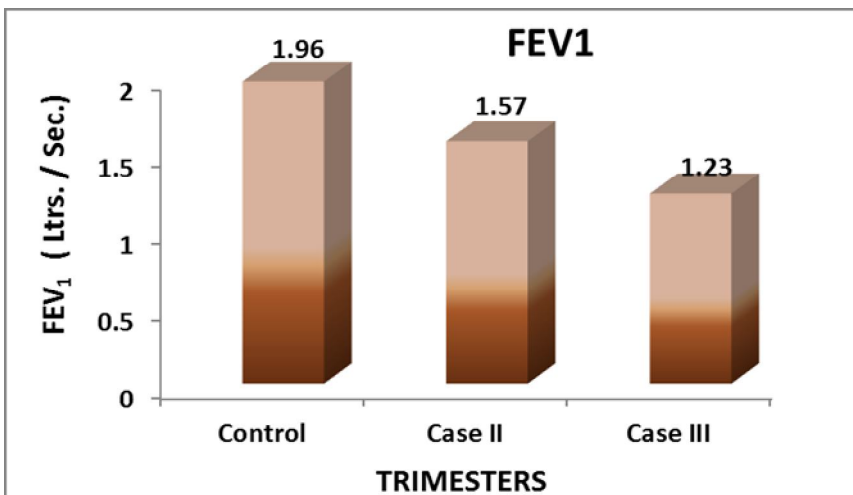


Table-2 shows that forced expiratory volume in one second (FEV1) in non pregnant subjects is higher than in pregnant subjects. It also shows that FEV1 decreases upto late pregnancy.

When compared with control the decrease in mid and late pregnancy i.e. second and third trimester is highly significant. The decrease from mid to late pregnancy is less significant.

TABLE - 3
STATISTICAL ANALYSIS FOR PEAK EXPIRATORY FLOW RATE (PEFR) IN CONTROL AND IN II & III TRIMESTERS OF PREGNANCY

<i>Sample</i>	<i>Mean</i>	<i>±SD</i>	<i>Range</i>	<i>% difference</i>	<i>'t' values</i>	<i>'p' values</i>	<i>Significant</i>
Control vs II	5.40 3.90	0.55 1.09	1.8-6.0	-27.7	5.601	0.0000	HS
Control vs III	5.40 2.68	0.55 1.07	0.8-4.5	-50.3	10.315	0.0000	HS
II vs III	3.90 2.68	1.09 1.07		-31.28	3.994	0.082 (<0.001)	HS

GRAPH - 3 GRAPHICAL REPRESENTATION OF PEFR (Lt/Sec.) IN CONTROL AND IN II & III TRIMESTER OF PREGNANCY

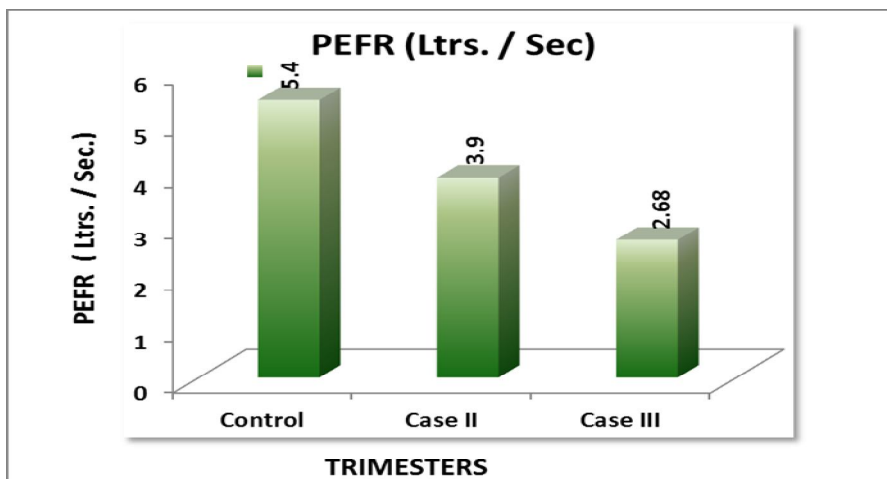


Table - 3 shows statistically decrease in PEFR from non pregnant to mid & late pregnant state i.e. when second and third trimester were compared with non pregnant state, the decrease in values were statistically highly significant.

When PEFR values of second trimester & third trimester was compared, it was observed that decrease in PEFR vales were insignificant.

TABLE - 4
STATISTICAL ANALYSIS FOR MAXIMUM VENTILATION VOLUME (MVV)
(Lt/sec.) IN CONTROL AND IN II & III TRIMESTERS OF PREGNANCY

<i>Sample</i>	<i>Mean</i>	<i>±SD</i>	<i>Range</i>	<i>% difference</i>	<i>'t' values</i>	<i>'p' values</i>	<i>Significant</i>
Control vs II	70.65 57.72	14.81 11.25	39-83	-26.61	5.390	0.0000	HS
Control vs III	78.65 47.00	14.01 11.34	34-69	-40.24	8.123	0.0000	HS
II vs III	57.72 47.00	11.25 11.34		-10.57	3.356	0.0016 (<0.005)	S

GRAPH - 4 GRAPHICAL REPRESENTATION OF MVV (Lt/Sec.) IN CONTROL AND IN II & III TRIMESTER OF PREGNANCY

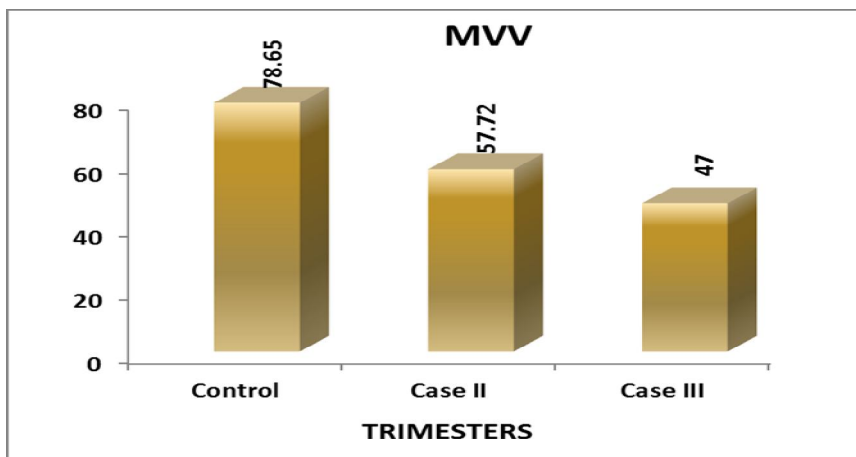


Table - 4 shows mean values in the table clearly depict that maximum voluntary ventilation (MVV) per minute decrease to a great extent in case groups when compared with control group. This is obvious from the high 't' values showing highly significant decrease in maximum voluntary ventilation. MVV decrease by almost half that is by 40.24% in late pregnancy as compared to non pregnant state and by one third that is 26.61% as compared to second trimester.

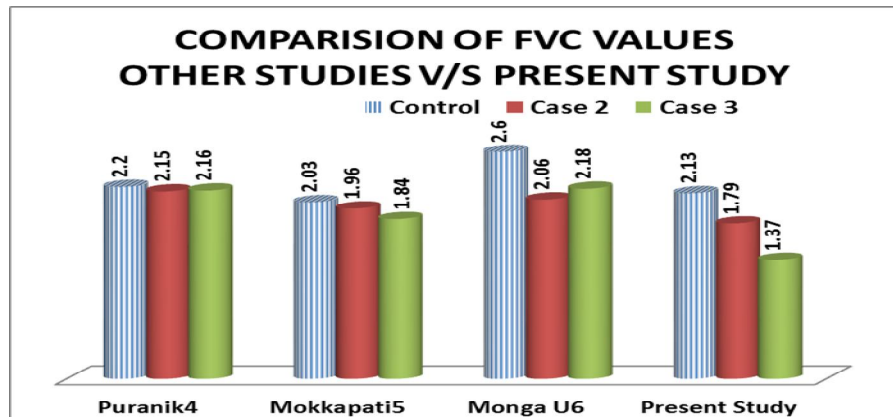
Respiratory parameters shows significant changes when third trimester values of case group were compared with non pregnant state (Control group).

The calculated 't' values and corresponding 'p' values are given for various sample groups for all the respiratory parameters.

: DISCUSSION :

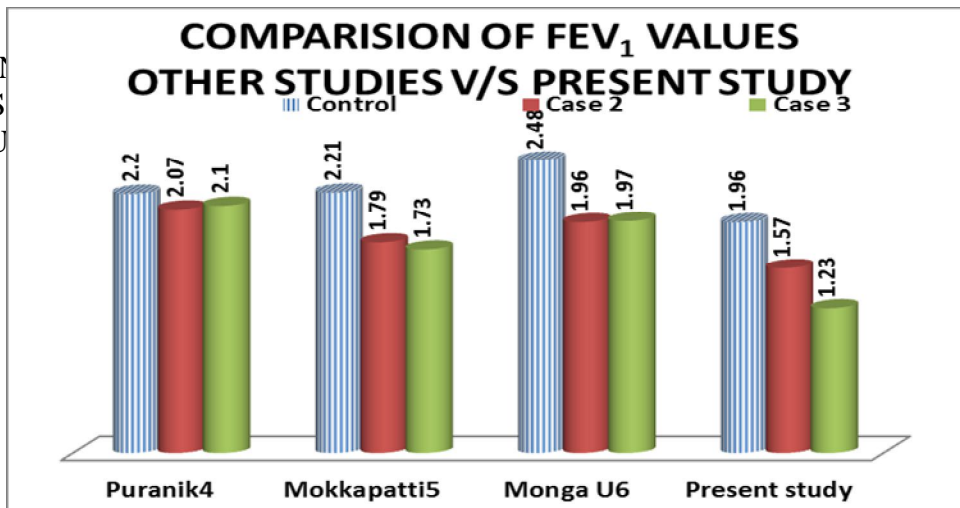
- ❖ PFTs were conducted with the help of medspiror.
- ❖ All the results were statistically analyzed.
- ❖ The results of PFTs parameters are briefly tabulated in table 1,2,3,4 for inferring the changes that have occurred at glance and compared with various studies that have already published.

GRAPH : 5
COMPARISION OF
FVC VALUES OF
PRESENT STUDY
WITH OTHER
STUDIES



- ❖ Some studies³ shows significant rise in FVC. Mostly all studies^{4,5,6} show decrease in FVC.
- ❖ Significant reduction in FVC may be obtained due to restrictive effect of the enlarging uterus⁴.
- ❖ FVC is diminishing due to augmentation of rib cage volume displacement, relative mobility of thoracic cage and unimpaired diaphragmatic movements⁴.

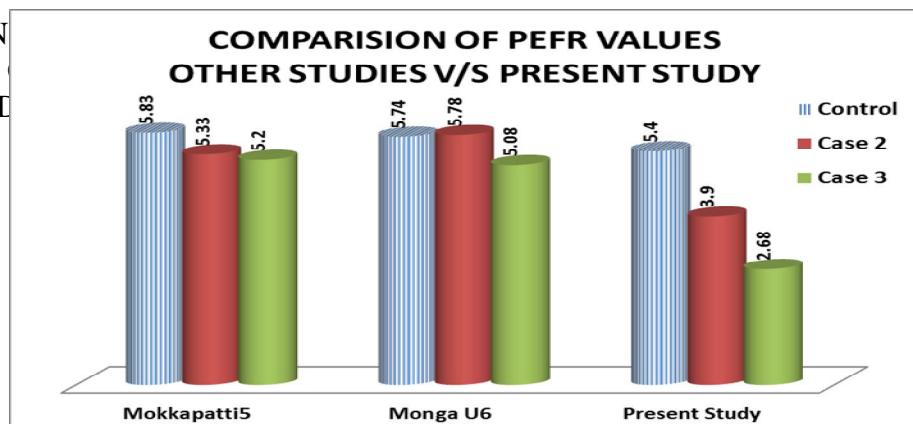
GRAPH : 6
 COMPARISON
 FEV₁ VALUES
 PRESENT STUDY
 WITH OTHER
 STUDIES



- ❖ FEV₁ is essential to assess ventilatory capacity of the pulmonary or to assess the ability to ventilate².
- ❖ A number of studies^{4,6,8,9} as reviewed show decrease in FEV₁.
- ❖ No change in FEV₁ seen in few studies^{3,5}.
- ❖ Decline in FVC and FEV₁ due to mechanical pressure of enlarging gravid uterus, elevating the diaphragm and restricting movements of lungs^{4,6,9} and thus hampering the forceful expiration.
- ❖ It may also be due to bronchoconstrict effect of decreased alveolar PCO₂ on the bronchial smooth muscles^{3,6}.

GRAPH : 7

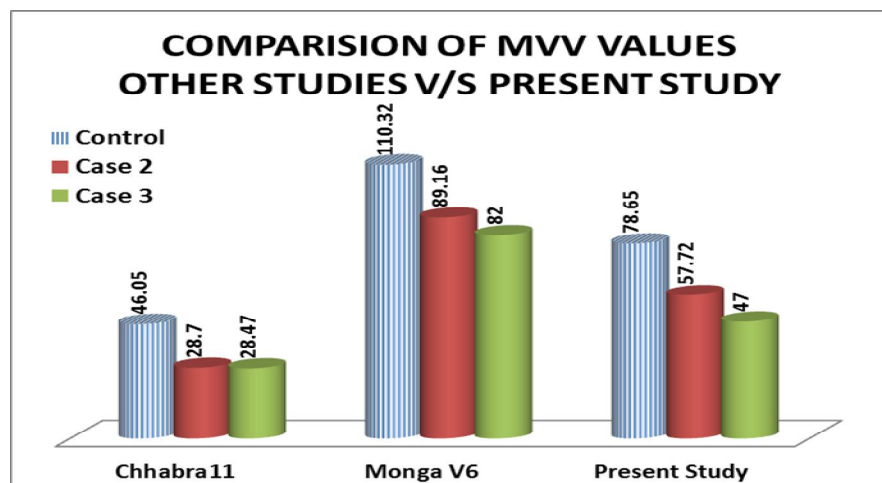
COMPARISON
 PEFR VALUES
 PRESENT STUDY
 WITH OTHER
 STUDIES



- ❖ All studies^{5,6} shows statistically significant, decline in PEFR.
- ❖ The restriction brought about by enlarged breast growing gravid and the fear of complications arising at term due to abdominal pressure required to forcefully inspire and expire for executing flow rates could render lowered values during pregnancy. The mechanical effects of gravid uterus cause relatively adaptive changes in pulmonary mechanics¹⁰.

GRAPH : 8

COMPARISON OF MVV VALUES OF PRESENT STUDY WITH OTHER STUDIES



- ❖ All studies^{6,11} show significant decline in mean values of MVV.
- ❖ MVV decrease during pregnancy indicating of a mechanical inhibition of chest⁴.
- ❖ The decrease MVV may also be attributed to an increased oxygen per unit of work done in the respiratory muscles scar.

CONCLUSION:

- ⊗ In control subjects, pulmonary function tests by medspiror were within normal range.
- ⊗ In second & third trimester of normal pregnant subjects, pulmonary function tests were seen lower as compared to normal non pregnant state.

- ✘ FEV₁, FVC decrease in pregnant case group providing that pregnancy is a restrictive condition and not obstructive, the decrease in values of these parameters also suggests that dysfunction of expiratory muscle is not there though weakness may be there and mechanical properties of respiratory system are normal that are due to altered configuration affecting elastic recoil of chest and intra thoracic diameter.
- ✘ Peak Expiratory Flow Rate (PEFR) decreases states that it might be caused by upward displacement of diaphragm, reduced strength of expiratory muscles and mechanical effect of growing uterus.
- ✘ Other factors as morning sickness, lack of motivation and resistance to exertion contribute in decreasing Maximum Ventilation Volume (MVV).
- ✘ Because of abdominal distension, there is gradually fall in all pulmonary function tests values.
- ✘ The importance of continuous antenatal surveillance and therefore use of pulmonary function test by medspiror is thus evident in early identification of suspected and established cases of restriction and obstruction in lungs during pregnancy. The disease can be identified early and its deterioration can be prevented by proper management.

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4

TO STUDY KNOWLEDGE ATTITUDE AND PRACTICE OF NON-PHARMACOLOGICAL MEASURES TO CONTROL HYPERTENSION IN GERIATRIC POPULATION.

Patel C H*, Mishra V R[#], Naik S**, Jadeja J.M.***, Mehta A S**, ****Nair G

*2nd year Resident, ** Professor, *** Professor and Head,
****Associate Professor

Department of Physiology, B. J. Medical College, Ahmedabad.

2nd year Resident, Department of Pharmacology, B. J. Medical College, Ahmedabad.

Abstract:

There is an increase in prevalence of hypertension all over the world as well as India. Hypertension affects almost all body organs and systems. Hypertension can be managed by using non-pharmacological measures as well. Objective of this study was to assess knowledge, attitude and practice of non pharmacological measures to control hypertension in geriatric persons. A total of 50 patients were interviewed. Their demographic details and responses to the questions were noted in the questionnaire.

About half of the study population was suffering from hypertension. Knowledge and practice of salt intake to control hypertension was satisfactory. But knowledge about correct level of blood pressure was lacking in 70% of study population. Knowledge about weight reduction, regular exercise, fruit intake and hypertension was poor. About half of the study population said that blood pressure can be controlled using drugs alone i.e. they were not aware of non-pharmacological measures.

Introduction:

The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC 7)¹ classifies hypertension as:

Stage	Systolic Blood Pressure (mm Hg)	Diastolic Blood Pressure (mm Hg)
Normal	<120	< 80
Pre-Hypertension	120-139	80-89
Stage 1	140-159	90-99
Stage 2	>160	>100

Globally, the overall prevalence of raised blood pressure in adults aged 25 and over was around 40% in 2008. The number of people with hypertension rose

from 600 million in 1980 to nearly 1 billion in 2008. The prevalence is significantly higher in geriatric population. Worldwide, raised blood pressure is estimated to cause 7.5 million deaths, about 12.8% of the total of all annual deaths. This accounts for 57 million DALY (disability adjusted life years) or 3.7% of total DALYs. Raised blood pressure is a major risk factor for coronary heart disease and ischaemic as well as haemorrhagic stroke. Blood pressure levels have been shown to be positively and progressively related to the risk for stroke and coronary heart disease. In some age groups, the risk of cardiovascular disease doubles for each incremental increase of 20/10 mmHg of blood pressure, starting as low as 115/75 mmHg. In addition to coronary heart diseases and stroke, complications of raised blood pressure include heart failure, peripheral vascular disease, renal impairment, retinal haemorrhage and visual impairment.² Treating high systolic blood pressure and diastolic blood pressure so they are below 140/90 mmHg is associated with a reduction in cardiovascular complications. Blood pressure can be managed with drugs as well as non-pharmacological measures which consist of exercise, weight reduction, salt restriction, eating fruits and vegetables, etc. Non-pharmacological measures play an important role in management of hypertension. The present study was done to assess knowledge, attitude and practice of non-pharmacological measures to control hypertension.

Objective:

To assess knowledge attitude and practice of non-pharmacological measures to control hypertension.

Materials and methods:

A Questionnaire was prepared consisting of 10 questions. Questions assessed knowledge, attitude and practice of the persons about non-pharmacological measures to control hypertension.

Sample Size: 50 persons

Study Site: Civil Hospital OPD

Study type: Single centered, cross-sectional, questionnaire based study.

Inclusion criteria:

1. Persons >55 years of age of either gender.
2. Those willing to participate.
3. Those giving consent.

Persons not willing to participate and/or not giving consent were excluded from the study. Blood pressure was measured in all the interviewed candidates

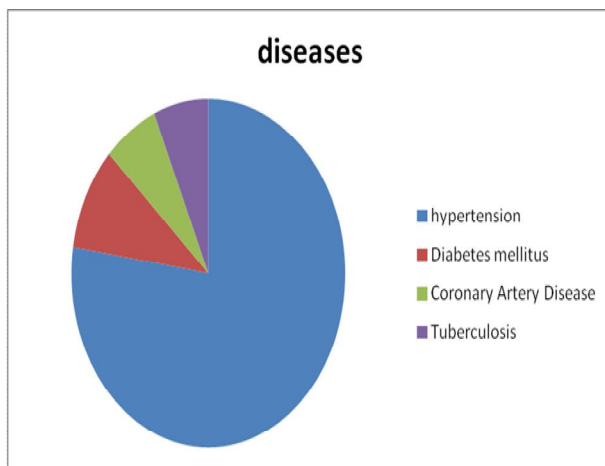
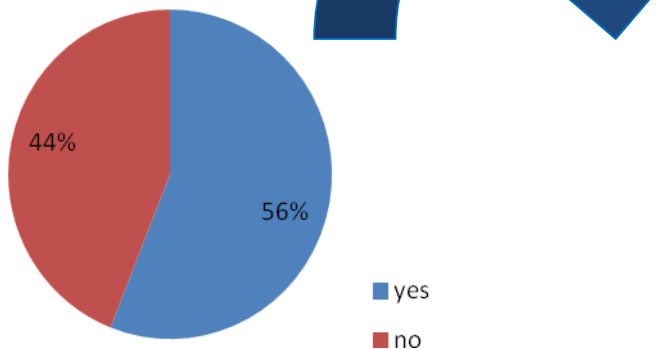
Data was analyzed using appropriate statistical tests.

Results:

A total of 50 persons were administered the questionnaire. Mean age of the population was 66.7 years. Sample consisted of 35 males and 15 females. History of smoking was positive in 24% of the population interviewed, while history of tobacco consumption was positive in 22% of the population. Blood pressure was higher than normal in 68% of the people interviewed.

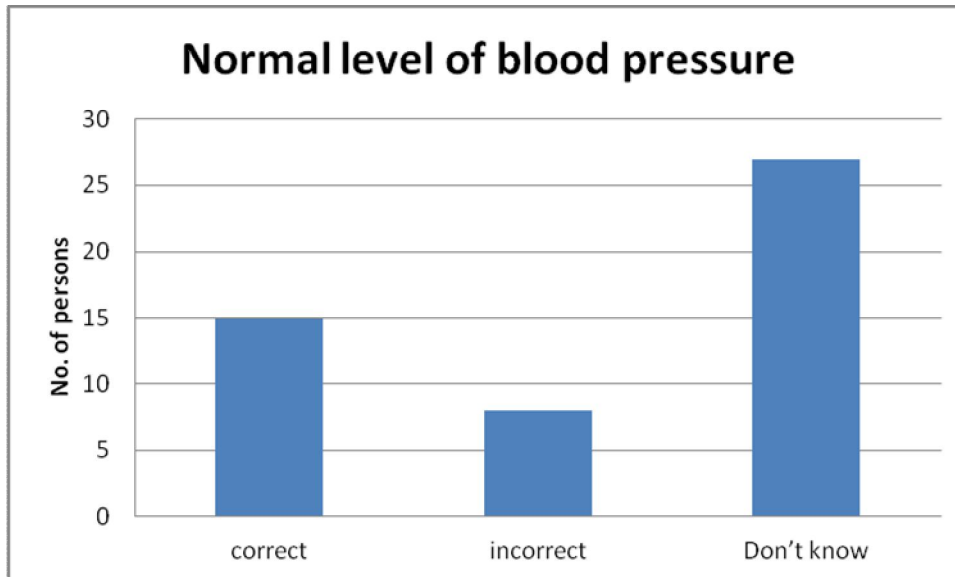
Out of 50 people interviewed, 48% said they were suffering from hypertension, 6% were suffering from diabetes mellitus and 4% were suffering from coronary heart disease.

Suffering from diseases



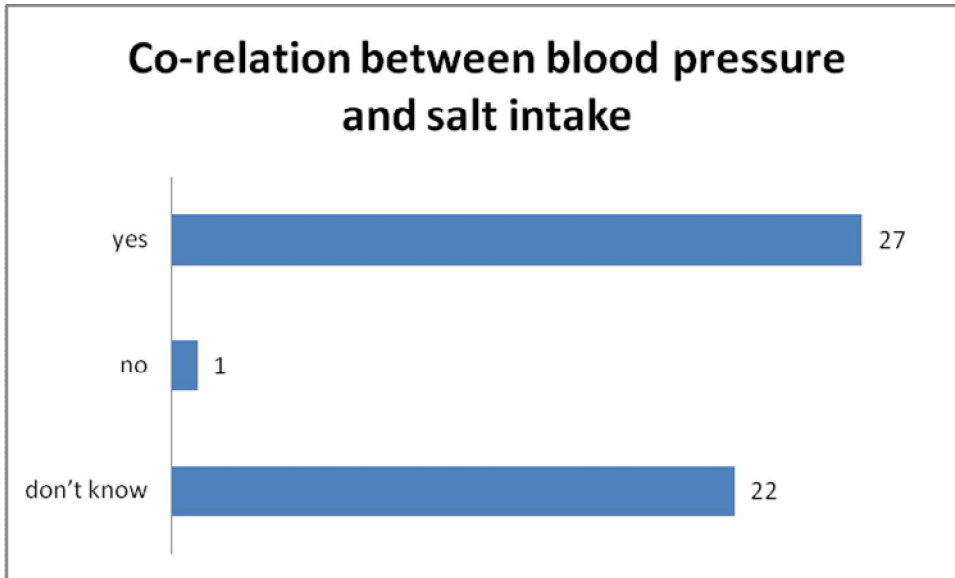
About 76% of respondents said that walking has a correlation with hypertension but about 67% of patients of hypertension said they practiced walking as a measure to control hypertension.

Only 15 of the total respondents were aware of the normal values of blood pressure.



About 82% of respondents said that blood pressure should be monitored regularly and about 62% of hypertensives used to measure their blood pressure regularly.

About 54% of all respondents said that there is a direct co-relation between blood pressure and salt intake.

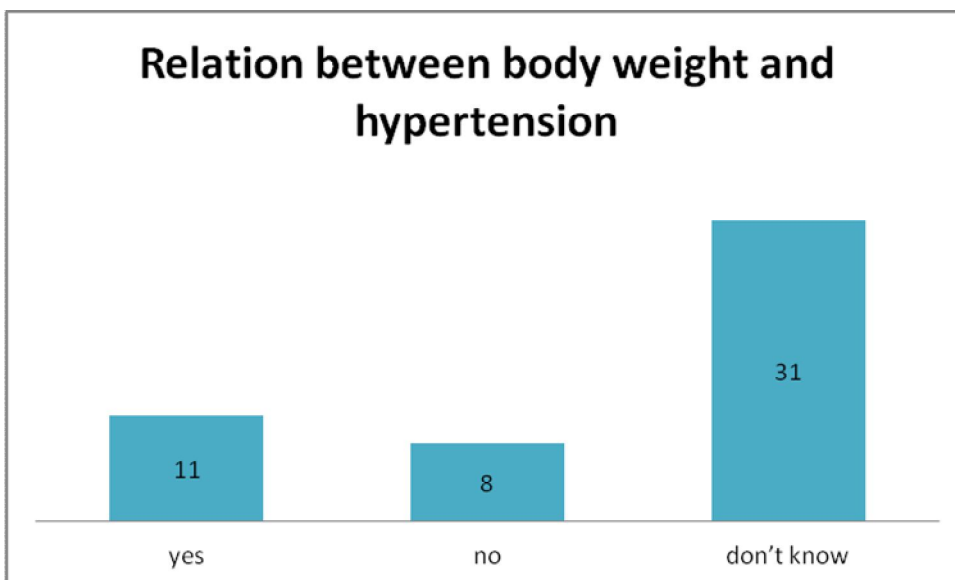


Values represent number of people in each group

Only 58% of hypertensives said that they have reduced salt intake to control hypertension.

About 42% of respondents were not aware whether salt intake be reduced in patient of hypertension or not.

Only 22% of respondents said that body weight has a co-relation with hypertension.



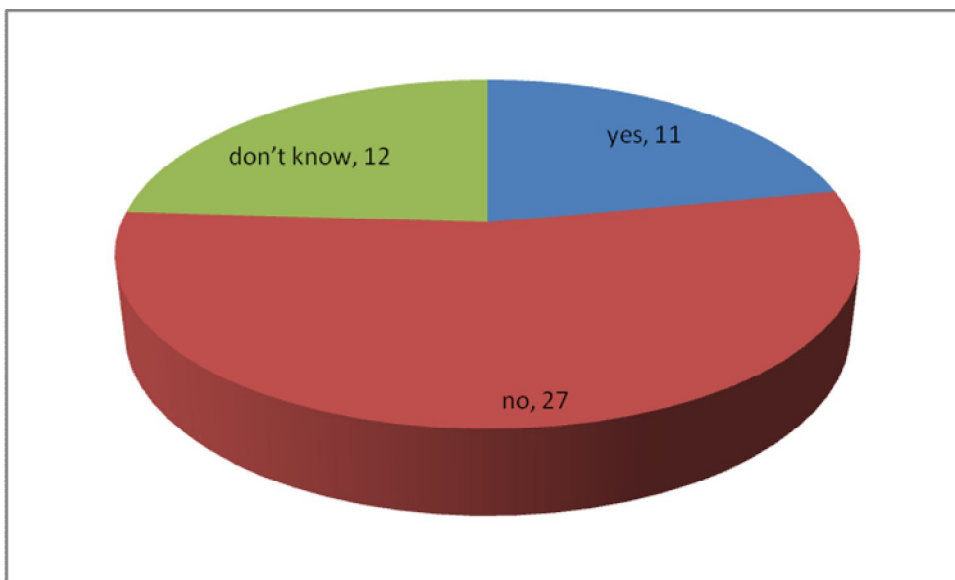
Values represent number of people in each group

Only 29% of hypertensives said that body weight should be maintained to control hypertension.

Only 36% of respondents were aware that pickles and papad contain high content of salt. Only 32% of respondents said that fruit consumption is related to blood pressure. Only 50% of hypertensives said that they take fruits in good amount.

Out of all, 86% of the respondents said that smoking and tobacco consumption should be reduced in patient of hypertension.

About 22% of all respondents said that blood pressure can be controlled with drugs alone.



Values represent number of people in each group

Discussion:

There is an increase in the prevalence of hypertension in past years². Hypertension affects a lot of body systems and organs. Hypertension can be controlled with drugs along with some non-pharmacological measures. The present study assessed knowledge attitude and practice of certain non-pharmacological measures to control hypertension in geriatric patients. About half of the study population was suffering from hypertension. Knowledge regarding walking as a measure to control hypertension was satisfactory. Majority of hypertensives (67%) did practice it as well. Majority of population was not aware of normal level of blood pressure. Half of the population was aware of co-relation between salt intake and blood pressure^{3,4,5}. Majority of population did not know about co-relation between blood pressure and body weight (78%)^{6,7}. Majority of population was not aware that foods like pickles and papad contained

high levels of salt. Only a minority of patients (30%) gave correct co-relation between blood pressure and fruit consumption. Majority of patient was aware that a person of hypertension should be advised to stop smoking and tobacco consumption. Salt intake has a direct co-relation to blood pressure. Diet rich in fruits also helps in reducing blood pressure. Weight reduction can also aid in decreasing of blood pressure. Physical activity further reduces blood pressure and this is independent of reduction in body weight^{8,9}. Abstinence from tobacco in any form also reduces blood pressure.

EFFECTS OF LIFESTYLE MODIFICATION ON BLOOD PRESSURE

Type	Description	Blood Pressure Effect
Weight reduction	Target body mass index 18.5-24.9	5-20 mmHg decrease for every 10 kg weight loss
Dietary approaches to stop hypertension eating plan	Diet rich in fruits, vegetables and low fat dairy products, with reduced fat total and saturated fats	8-14 mmHg reduction
Dietary sodium restriction	Reduce dietary sodium intake to less than 100 mmol/L (2.4 g or 6 g of sodium chloride)	2-8 mmHg reduction
Physical activity	Regular aerobic exercise at least 30 min/d most days of the week.	2-4 mmHg reduction

Adoption of above mentioned non-pharmacological measures e.g. salt restriction, physical exercise, weight reduction, consumption of fruits etc. can significantly reduce the requirement of drug therapy in a large number of hypertensives. Inclusion of DASH diet plans and life style modifications can play a key role in management of hypertension¹⁰.

Conclusion:

While knowledge and practice regarding salt intake, tobacco consumption remains satisfactory, but regarding body weight, fruit intake and correct levels of hypertension remains poor in the study group. But further large scale studies need to be undertaken to know about correct picture about knowledge of hypertension.

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5

A SURVEY AMONG FACULTY OF PHYSIOLOGY DEPARTMENT TO ASSESS WHY PHYSIOLOGY IS DIFFICULT FOR STUDENTS TO LEARN

Dr.Dullo P*, Dr .Chaudhary R*, DrTandonRV♦
* Assistant Professor ♦Associate Professor
Department of Physiology
Govt. Medical College,
Kota, Rajasthan

Survey done among different medical colleges of India

This survey has 2 figures and 9 tables
170 words in abstracts and 4 key words

Corresponding Author

Dr Puja Dullo
E-mail:puja_dullo@yahoo.com

ABSTRACT

Undergraduate and Postgraduate physiology teachers were asked to participate in a survey about the possible source of students' difficulty in learning physiology. Twenty two physiology faculty members from seven different medical colleges responded to the 23- question survey; fifteen of the respondents also responded to a request for written comments about this issue prior to taking survey. Three categories of possible factors contributing to physiology being hard to learn were defined; (1) the nature of the discipline, (2) the way it is taught and (3) what students bring to the task of learning physiology. Respondents thought that characteristics of students (they believe that duration of 1year is less and physiology course is extensive which teachers try to complete rapidly and characteristics of the discipline (that physiological phenomenon needs to be understood at different level of organizational level simultaneously) were significantly more important than the way it is taught in making physiology difficult to learn. Recommendations are offered in this article to help students deal with the sources of difficulty that were identified.

Keywords:- teaching, learning, physiology as a discipline, student preparedness

INTRODUCTION

Teaching and learning at the basic science level (First MBBS) poses significant challenges to the medical students. The first year medical students faces difficulty of correlation, imaginations and transfer of learned experiences during initial period of about one year^{1,2}. They are not able to associate the concepts to previous knowledge (pre-medical education) on which the teacher can build upon.

The students generally approach topics in physiology as a series of unrelated phenomena that share few underlying principles. For example students think, the Fick's equation for cardiac output is fundamentally different from a renal clearance equation³.

This assertion is based on many years of teaching physiology to first year medical students, conversation with students, and interaction with fellow physiology teachers at all levels.

What do physiology teachers mean when they claim that their students find it hard to learn Physiology? Alternatively, we can ask what is it that leads physiology teachers to believe that students find physiology hard.

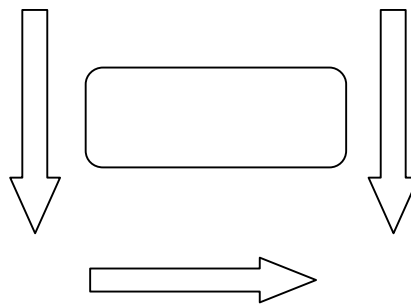
What factors might make physiology hard for students to learn?

In thinking about learning any discipline, we need to consider three things: (1) the nature of the discipline:

(2) way in which we teach the discipline, and

(3) how students learn the discipline.

These three factors interact with each other in many ways⁴.



PHYSIOLOGY AS A DISCIPLINE.

INFLUENCES

1 HOW WE TEACH PHYSIOLOGY?

2 HOW THE STUDENTS LEARN PHYSIOLOGY?

Figure-1 Model served as the basis for the writing of the survey questions.

By the nature of the discipline, we mean the characteristics of the subject matter, how experts they reason about it, how they communicate their knowledge and understanding of the discipline and how they correlate it with the prior read subjects. The way in which we teach the discipline refers to all of the usual practices that students encounter in our classrooms as we attempt to help them to learn the discipline and how much textbooks and other study matter make the topic conceptually understandable and most important how their background of basic language stress them out initially to pick up the topic being taught by us.

What we mean by how students learn Physiology. It means how much they are going to take up the concepts of topic and how they should go through the topic for proper understanding and whom they should prefer for their guidance.

Considering these three factors a previously ready made questionnaire was used after some modifications in the survey in the summer of 2009 at Government Medical College Kota.

METHOD

Participation in the survey was solicited with an e-mail message as well as postal service and recipients were asked to do two things.

Respondents were first asked write in at least up to 100 words to tell us why they think that students find physiology a hard subject to master.

Then the survey consisted of three sets of questions, each dealing with factors contributing to one of the categories of difficulties. These questions are shown in Table-1. Respondents were asked to rate each of the 23 factors using a 5- point Likert scale with 1 as a major contributor, 3 as a minor contributor, and 5 as NOT A SIGNIFICANT contributor to student difficulty in learning physiology. Rating 2 and 4 were associated with 1 and 5 respectively. In reporting the results of the survey (Fig.2, Table2); the scale has been presented so that the more important factors have higher numbers; for easy way to understand the data presented.

Data from responses to Likert scale questions are ordinal in nature, and statistical treatment of such data must reflect this. Statisticians assert that the ordinal data cannot be properly analyzed with parametric tests (such as the t-test) but must be analyzed with nonparametric method⁵. Nevertheless, researchers continue to apply parametric tests to such data, often with attempts at justification for this, but often without any discussion of the issues⁶. In

comparing the responses to different questions or groups of questions on the survey, nonparametric tests (χ^2 – tests or Wilcoxon signed- rank tests) were employed⁷.

RESULTS

Who Responded

Responses to the survey were obtained from 22 physiology teachers: 7 teachers from Gujarat, 2 from Jammu and rest from Rajasthan. Collectively, the respondents taught physiology at all post secondary levels (undergraduate and postgraduate programs and DMLT teaching).

Written Comments

Fifteen of twenty two respondents provided answers to the question “----- why do you think students find physiology a hard subject to master” before they saw the survey questions. Responses ranged in length from 50 to 200 words.

The initial reading of these responses made it clear that physiology teachers expect students to understand the subject and try to co-relate it with the dynamic system so as they have the ability to “think” about physiological mechanisms as described in the model shown in **Fig 1**.

Two out of 22 responses contained comments about factors to the personal lives of students and the academic environment outside of the physiology classroom.

Not only did respondents’ comments map on to the model (**Fig 1**) with surprising frequency, but many comments mirrored specific questions that make up the survey (as in **Table 1**). **Table 3 to 5** shows examples of the comments made by respondents, with many of them clearly related to the indicated survey questions. Three out of seven factors about the discipline of physiology were found in the written comments, two of eight factors about teaching were mentioned, and four of eight factors were mentioned about the students (and this was one of the most frequent comments made by respondents).

Responses to survey questions

The collected responses to each of the 23 Questions were first tabulated by counting the number of responses in each rating (5 through 1). The HIGHER the rating, the more important the factor was thought to be in contributing to make physiology hard to learn (as previously indicated, Likert scale numbers were reversed to make it easier to understand the result). The responses to questions pertaining to the discipline, teaching and students were counted separately, and average numbers of ratings for each category were calculated (the number of questions in each category was different). Averages are shown in **Fig. 2**. Based on these results it appeared that factor related to the nature of the discipline of physiology and factors related to the students were regarded as more important (this being highest in rating) than factors related to teaching.

χ^2 tests were carried out to compare the distribution of rating on question in each of the three categories. The comparison between discipline and teaching yielded a $\chi^2 (5,23) = 22.77$ Degree of Freedom = 4 ($p < 0.001$)

Table 7. The comparison between students and teaching yielded a $\chi^2 = 77, 38, DF=4$ ($p < 0.001$) Table 8. The comparison between discipline and students yielded a $\chi^2 = 25.37, DF = 4$ ($p < 0.001$) Table 9. Respondents to the survey thought that teaching practices are less important than the characteristics of students and the discipline characteristics in making physiology hard for students to learn.

The rating for each 23 questions from all 22 respondents were summed, and the aggregate sums were used to rank order the 23 factors described in the survey, starting with the most significant (5= MAJOR contributor) to the least significant (1= NOT A SIGNIFICANT contributor). The factors in rank order can be seen in Table 6. The rank ordering is essentially unchanged when different procedures are used.

Concentrating on the "Top 10" reasons faculty members think physiology is hard for students to master, we see that three factors (Question 1, 2 & 4) describe the discipline of physiology, five factors describe students characteristics (Question 22, 21, 23, 18 & 16) and only two factors in the Top 10 related to the teaching of physiology (Question 14 & 15).

It is worth noting that the highest rated factor shown in Table 6 is related to the need for students regarding the less duration (1 year) for the extensive physiology course which teachers try to complete rapidly (Question 22).

Michael Joel⁴ in his study assessed need for student to be able to do casual (mechanistic) reasoning to understand physiology (Question 3) to be rated highest while Howard Kutchai⁸ originally asserted that the dependence of physiology on mathematics (Question 6), which is ranked number 21 on the list, and the dependence on physics and chemistry (Question 1), which is ranked number 8, were the principle sources of the difficulties that students exhibit in learning physiology.

According to previous studies Question No. D1, D3 and D6 were important source for difficulty that students have in learning physiology which we compared with our result S22 using Wilcoxon Matched Pairs Signed Rank Test. When compared Question S22 with Question D1 ($p < 0.01$); on comparing S22 question with D3 question p-value was < 0.001 but on comparing Question S22 with Question D6 p-value was 7.63 that means not significant which means that mathematical skill was not factor which could affect the physiology learning among students in Indian Medical Schools but casual understanding of mechanics did have a significant association with learning along with course duration and extensiveness. In our study most important source of difficulty in learning Physiology is Q no S22 as compared to previous studies, which is

having significant difference ($P < .01$) with QD1 and D3, while results with S22 and D6 were not significant.

DISCUSSION

The written comments provided by slightly more than half of the respondents offer considerable support for the three factor model (Fig. 1). The comments consistently could be assigned to the three categories of factors constituted the survey: (1) the nature of the discipline of physiology, (2) the teaching of physiology and (3) what students bring to the learning of physiology. In addition, however, many of the respondents consider physiology hard for the students due to the influence of the world outside the classroom.

The results of our survey clearly indicate that teachers of physiology believe that the nature of the discipline and what students bring to the task of learning physiology are the most important determinants of physiology being hard. The way we teach physiology, while not unimportant, is clearly viewed as being significantly less important than the other two factors.

Do we know the source of difficulties learning a science?

Unfortunately little data we know regarding the objective data that might suggest the sources of these difficulties. It is known that students commonly enter the physiology classroom lacking the expected prerequisite knowledge and skill^{8,9}. It is well known that correlation of one context with another, is difficult among students' which clearly contributes^{10,11}, their inability to use their prerequisite knowledge (chemistry and physics) in learning physiology. It is also known that students, both before and after instruction have serious misconception (faculty mental models) about physiological phenomena^{12,13}. Students have difficulty in interpreting graphs^{14,15} and using equation¹⁶ to gain a conceptual understanding of phenomena. Casual reasoning and making predictions about changes to the state of a system are known to be difficult and require assistance to be mastered^{17,18}.

Thus these data certainly corroborate the factors identified by faculty members as making the learning of physiology difficult. We require more research to determine the extent to which the factors identified as contributing to student's difficulty in learning physiology actually affect learning outcomes.

How is our teaching having impact on students difficulties?

Respondents' to the survey appeared convinced that the ways in which we teach physiology were NOT a major source of the problems, this is evident in the distribution of ratings shown in Fig.2 and Table 2 and in the χ^2 tests that were performed.

In spite of our survey, there are many reasons for believing that this is not the case. That is to say, there is considerable evidence that at least major source of students' failure to master science at the expected level is due to current

teaching practices. For this reason different designs for easy teaching are being established ^{19,20} to be used in most colleges and universities. We are, in general, not doing as good a job of helping the learner to physiology as could be done. If students are not reaching the goals we have set for them, the cause of this failure lies with the ways we teach as much as it does with the difficulties of the discipline or the students.

What should we do to HELP our students?

As per our study we found that the prime factor is the time crunch and information over loading.

Teachers often over rate the importance of their content and underrate their influence. However, students, forget much of the content that they memorize. Thus attempts to teach students all that they will need to know is futile. Rather, it is important that students develop an interest and love for life science understanding. Inspiring and motivating students is critical because unless they are inspired and motivated our efforts are pointless. Teachers must not worry about “losing” or “wasting” valuable lecture time for in class discussion collaborative problem solving and inquiry based activities that take time away from covering content ²¹; teachers must design activities to focus students learning on how to use scientific knowledge to solve important questions. This is important because learning is not committing a set of facts to memory but the ability to use resources to find, evaluate and use information. Deep thinking is essential to understand the residue of thinking ²¹. We need to make learning fun and create excitement, joy and love for it.

With more known about the physiological mechanisms of the body than can possibly be learned within a single course, a principle approach to decide what to include in the course is of some considerable benefit. Students also need to know that we expect them to understand the “core principles” and the application of them and that this is more valuable than knowing a hundred isolated facts ²².

“Core principle” can be used to develop an assessment tool with which we can determine whether students do, in fact, understand what we expect them to understand. Conceptual assessment of student understanding of “core principles” can be done independently of their knowledge and understanding of the fine grained details of particular physiological system ²².

Instead of relying on a Textbook, we must guide them to follow CREATE (i.e., Consider, Read, Elucidate hypotheses, Analyze data and Think of the next Experiment) series of analysis ²³. Applying CREATE pedagogical tools in preparation for the class free students to spend their classroom time on instructor- led in depth discussion of the experimental findings and their implication. We find that CREATE students are empowered by rising to the intellectual challenge of deciphering the logic of each article and realizing, often for the first time, that they can ‘think like scientists’. At the same time, CREATE

instructors are able to run the class more like a laboratory meeting than a lecture, making use of their advanced training and reducing the amount of pre class preparation required²³.

Physiology is seen as an important core component of any medical curriculum. Traditionally, the learning of physiology at Medical School has relied heavily on system based didactic lectures. More recently, with changes in the medical curricula globally, it is increasingly being taught in a number of different ways ranging from problem based in various forms, case based, interactive teaching method and a combination of many processes²⁴.

Other concepts to learn science can also be used e.g., pencil-and-paper pretest as described by Kutchai⁸ or using web- based test which is very easy to administer and require no class time¹³.

We teachers need to recognize that everything going on outside our classroom influence our students which have been specified by few responders'.

Where do we go next?

We need to ask students in physiology classes in our college to tell us what they think. Do they expect physiology to be hard as they start the course? At the end of the course, do they still think that it was hard?

Does their assessment of the degree of difficulty depend on how well or poorly they did in the course? Do students attribute their difficulties learning physiology to the same factors that faculty members have proposed? These are issues for future research.

Will the clinical case based teaching in physiology topic help them to understand the concepts in better format?

CONCLUSION

Our job as teacher is to help students understand and learn physiology. We must understand the sources of difficulty that students have in learning physiology, the better we can do in our job.

Other than this we must keep in mind the fourth factor i.e., outside environment factor which also has a good impact on students concentration ability.

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TABLE- 1 **Survey Questions**

Part(A) COMMENTS REGARDING THIS TOPIC IN YOUR WORDS
(not more than 100 words):
Part(B)
Rating for each factor : 5 - Strongly Agree, 4 - Agree, 3 - Neutral,
2 - Disagree, 1 - Strongly Disagree
Q1 What makes the physiology hard to learn?
(D1) Understanding of physiology is based on an understanding of "Physics & Chemistry & Biology i.e., Biophysics' including Mathematics.()
(D2) Physiological Phenomena need to be understood at a number of different organizational levels simultaneously (from the molecular to the whole organism).
(D3) Understanding Physiology requires the ability to reason causally (mechanistically).
(D4) Understanding physiology requires at least some ability to think about dynamic systems.
(D5) Physiology, like other life sciences, seems to encourage the tendency of Teleological thinking.
(D6) Much of our understanding of Physiological mechanisms is communicated graphically or in other mathematical way.
(D7) The language of Physiology is a mixed one, with many commonly used words taking on specific scientific meanings that are different from (some time opposite from) their lay meanings.
Q2. What is it about the way that physiology is taught that makes it hard to learn?
(T8) Textbooks are typically descriptive compendia of facts, not

mechanistic descriptions of phenomena or concepts.()
(T9) Neither authors nor teachers stress the commonalities of function across organ system.()
(T10) Teachers do a poor job of defining and communicating our learning performance objectives (what should the students be able to do).()
(T11) Teachers expect too many memorized facts & too little understanding at the same time.()
(T12) Teachers talk (Physiology) too much & students talk (Physiology) too little.()
(T13) Teachers and authors use language imprecisely, use too much jargon, & use too many acronyms all to the detriment of learning.()
(T14) Integrated teaching of Physiology with Anatomy & Biochemistry is not followed in every institute.()
(T15) Mostly students basic language before coming to Medical field is not English it is Hindi or any regional Language so he/ she, is not able to Understand teacher's language during initial months of I MBBS Program, so they Lag behind.()
Q3 What is it about the way students attempt to learn physiology that makes it hard?
(S16) Students believes that "Learning " is the same thing as "Memorizing".()
(S17) Students compartmentalize (Pigeon-hole) everything, failing to look for or see , commonalities across organ system or phenomena.()
(S18) Students fail to appreciate integrative nature of physiological mechanism; they don't want to think about respiratory now (while learning acid/ base balance) because they studied it months ago & have already passed the test on that subject.()
(S19) Students assume that all physiological responses must benefit the organism.()
(S20) Students tend to ignore graphs, tables& figures & when they attempt to use them they don't understand the meaning .()
(S21) Students prefer to take guidelines from their senior students and read selective topics from the system.()
(S22) The duration of Physiology course is less (1year) and it is extensive thus has to be completed rapidly by the teachers.()
(S23) There is no specified demarcation in syllabus or textbook between Undergraduate and Postgraduate level.()

TABLE- 2

Distribution of all ratings (average)

Rating→ Questions↓	5	4	3	2	1
Discipline of physiology	32.85	27.42	15.42	8.4	2
Teaching of physiology	25	20	16.12	8.75	2.57
Student characteristics	37.75	32	9.75	3.14	1.29

FIGURE-2

Distribution of average ratings of all Questions (chart)

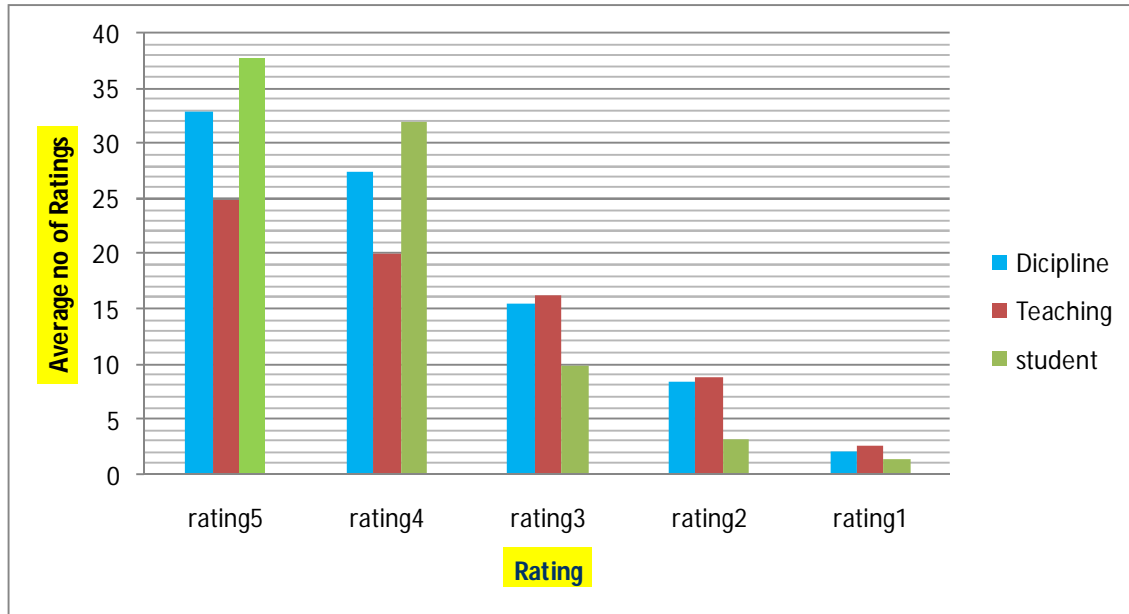


TABLE – 3

A sample of comments about the contribution of the nature of Physiology as a discipline to the difficulty students have

“Lack of understanding of the fundamental scientific principles that underlie physiology e.g., physics, biology, chemistry----.“ (Question 1)

“ Physiology requires multi level ability to think across a wide span.” (Question 2)

Students are expected to understand multistep dynamic mechanisms using casual reasoning.” (Question 4)

Questions on the survey that correspond to the contents of a particular comments are indicated

TABLE - 4

A sample of comments about the contribution of the typical Teaching of physiology as a discipline to the difficulty Students have

“ There is requirement of integrated teaching in every institute.” (Question 14)

“ Lack of understanding teachers’ language during initial months of I MBBS as students basic language is not English in every region but it is Hindi or any regional language.” (Question 15)

TABLE - 5

A sample of comments about the contribution of the what Students bring to learning to the difficulty students have

“ Extensive course and less duration of teaching.” (Question 22)

“ Teachers teach rapidly to complete course.” (Question 22)

“ Guidelines given by senior students are preferred to be followed by students rather than given by teachers.” (Question 21)

“ No specified demarcation in syllabus or textbook between undergraduate and postgraduate level.” (Question 23)

“ Students are not able to integrate the physiological mechanism as they concentrate only on one system and do not want to correlate it with any other system.” (Question 18)

TABLE – 6

Rank order	Aggregate Rating	Question and category	Factor for students difficulty
1	96	S22	The duration of Physiology course is less (1year) and it is extensive thus has to be completed rapidly by the teachers
2	95	D2	Physiological Phenomena need to be understood at a number of different organizational levels simultaneously (from the molecular to the whole organism).
3	94	S21	Students prefer to take guidelines from their senior students and read selective topics from the system
4	92	S18	Students fail to appreciate integrative nature of physiological mechanism; they don't want to think about respiratory now (while learning acid/ base balance) because they studied it months ago & have already passed the test on that subject.
5	91	S23	There is no specified demarcation in syllabus or textbook between Undergraduate and Postgraduate level
6	88	S16	Students believes that "Learning " is the same thing as "Memorizing
7	87	T14	Integrated teaching of Physiology with Anatomy & Biochemistry is not followed in every institute
8	87	D1	Understanding of physiology is based on an understanding of "Physics & Chemistry & Biology i.e., Biophysics' including Mathematics
9	85	D4	Understanding physiology requires at least some ability to think about dynamic systems.
10	85	T15	Mostly students basic language before coming to Medical field is not English it is Hindi or any regional Language so he/ she, is not able to understand teacher's language during initial months of I MBBS Program, so they Lag behind
11	84	S20	Students tend to ignore graphs, tables& figures & when they attempt to use them they don't understand the meaning
12	81	S17	Students compartmentalize (Pigeon-hole) everything, failing to look for or see , commonalities across organ system or phenomena
13	79	T8	Textbooks are typically descriptive compendia of facts, not mechanistic descriptions of phenomena or concepts
14	79	D5	Physiology, like other life sciences , seems to encourage the tendency of Teleological thinking
15	77	D3	Understanding Physiology requires the ability to reason causally (mechanistically).
15	72	T11	Teachers expect too many memorized facts & too little understanding at the same time
17	70	T9	Neither authors nor teachers stress the commonalities of function across organ system
18	69	S19	Students assume that all physiological responses must benefit the organism
19	68	T12	Teachers talk (Physiology) too much & students talk (Physiology) too little
20	67	D7	The language of Physiology is a mixed one, with many commonly used words taking on specific scientific meanings that are different from (some time opposite from) their lay meanings
21	66	D6	Much of our understanding of Physiological mechanisms is communicated graphically or in other mathematical way
22	60	T10	Teachers do a poor job of defining and communicating our learning performance objectives (what should the students be able to do)
23	56	T13	Teachers and authors use language imprecisely, use too much jargon, & use too many acronyms all to the detriment of learning

TABLE – 7

Chi-square Test to compare the distribution of ratings between survey questions of discipline and teaching.

Rating→ Questions↓	5	4	3	2	1
Discipline of Physiology	230	192	108	42	04
Teaching of 18 Physiology	200	160	129	70	

Chi-Square=22.77 DF=4 (p<.001)

TABLE – 8

Chi-square Test to compare the distribution of ratings between survey questions about student and teaching.

Rating→ 1 Questions↓	5	4	3	2
Student 1.29 Characteristics	37.75	32	9.75	3.14
Teaching of 2.57 Physiology	25	20	16.12	8.75

Chi-Square=77.38 Degree of freedom=4 (p<.001)

TABLE - 9

Chi-square Test to compare the distribution of ratings between survey questions about discipline and students

Rating→ 1 Question↓	5	4	3	2
Discipline of 04 Physiology	230	192	108	42
Students 1.29 characteristics	37.75	32	9.75	3.14

Chi-Square=25.37 DF=4 (P<.001)

**6
STUDY OF ANTIBIOTIC SENSITIVITY PATTERN OF
DIFFERENT BUGS ISOLATED FROM DIFFERENT
SPECIMENS AT TERTIARY CARE CENTRE.**

Sachin Darji*, Iqbal Desai**, Anil Chadha*** ,

Department of Institution where study is carried out:

Department of Microbiology, Gujarat Research and Medical Institute, Near New Civil Hospital campus, Shahibag Ahmedabad 380016.

*(M.D.Microbiologist), **(M.D.Pathologist), *** (M.B., M.S., D.N.B., M.Ch),

Correspondence Address: Dr Sachin M Darji, M.D.

ABSTRACT:

The purpose of this study was to detect antibiotic resistant pattern of bugs isolated from different specimens at tertiary care centre. So that indiscriminate use of antibiotics can be prevented and arousal of resistant to antibiotics can be minimize.

Design:

During a period of one and half years from 1st January, 2010 to 30th June, 2011, a total 3255 samples were processed out of which 1351 samples were showing growth and 1904 found sterile.

Result:

Out of total 1351 positive samples, 895(66.25%) samples showing the growth of Gram negative organisms and 329(24.35%) samples were showing the growth of Gram positive organisms and 127 (9.40%) samples were showing growth of Candida species.

Conclusion:

ESBL and AmpC betalactamse production most commonly found in Enterobacteriaceae followed by non fermenters.

Keyword:

Prevalence of different bugs, Antibiotic resistant, ESBL, AmpC Beta lactamase.

Introduction:

Extended spectrum β -lactamase and AmpC β -lactamase are of increasing clinical concern. Among the resistant bugs ESBL production are most commonly found in *Klebsiella species* and *Escherichia coli* but also occurs in other gram negative bacilli. It is typically plasmid mediated. It is capable to hydrolysed the Penicillins, 1st, 2nd, 3rd generation Cephalosporins and Monobactams. In such cases Betalactam antibiotics and it's combine with Betalactamase inhibitors are the drug of choice. AmpC betalactamase production are most commonly found in *Klebsiella pneumoniae*, *Escherichia coli*, *Salmonella spp*, *Proteus mirabilis*, *Citrobacter freundii*, *Acinetobacter baumannii*, *Enterobacter spp*.and *Pseudomonas aeruginosa* which shows resistant to BL(Beta lactam) and it's combination with BLI (Betalactamase inhibitors) in such cases Carbapenems are drug of choice. Even today bugs producing carbapenemase also isolated at tertiary care centre. Main aim of this study is to detect common types of bugs isolated from different specimens and there sensitivity pattern so that indiscriminate use of antibiotics and emergence of resistance in bugs can be prevented.

Materials and Methods:

During a period of one and half years from 1st January, 2010 to 30th June, 2011, a total 3255 samples were processed. The bacterial isolates from various clinical specimens (Blood, Urine and Endotracheal secretion) of patients admitted in our

hospital were cultured on Nutrient, Mac Konkey's and Blood agar as per standard protocol. The isolates were identified by different biochemical reactions. The antimicrobial susceptibility testing was performed by Kirby–Bauer disc diffusion method.^[1] Gram negative bacilli were tested against Ampicillin(10µg), Ampicillin+Sulbactam(10/10µg), Cephoperazone(30µg), Ceftriaxone(30µg), Cephoperazone+Sulbactam(30/10µg), Cefipime(30µg), Cefipime+Tazobactam(30/10µg), Imipenem(10µg), Meropenem(10µg), Levofloxacin(5µg), Gatifloxacin(10µg), Ciprofloxacin(5µg), Doxycyclin(30µg), Amikacin(30µg), Gentamicin(30µg), Aztreonam(30µg), Piperacillin+Tazobactam(100/10µg), PolymyxinB(300U), Colistin. Disc of Cephoperazone(30µg) and Cephoperazone +Sulbactam(30/10µg), was used as a marker for ESBL producers. ≥8 mm Increasing the diameter of zone of inhibition near the disc containing combined betalactam and betalactamase inhibitors as compare to zone of inhibition near betalactam alone used as marker for ESBL producing strain.^[1] Gram positive cocci were tested against Penicillin, Amikacin(30 µg), Gentamicin(30µg), Clindamycin(30µg), Levofloxacin(5µg), Gatifloxacin(30µg), Ciprofloxacin(5µg), Vancomycin(30µg), Erythromycin(15µg), Linezolid(30µg), Clindamycin(2µg), Vnacomycin(30µg), and Cefoxitin(30µg). Sensitivity of bugs to Cefoxitin (30µg) was used as a marker for MRSA or MSSA. The results were interpreted according to standard CLSI criteria^[1].

Results:

During a period of one and half years from 1st January, 2010 to 30th June, 2011, a total 3255 samples were processed out of which 1351 samples were showing growth and 1904 found sterile. Out of total positive samples, 895(66.25%) samples showing the growth of Gram negative organisms and 329(24.35%) samples were showing the growth of Gram positive organisms and 127(9.40%) samples were showing growth of Candida species^[2]. From **Urine** sample *E.coli*(36.54%) was most commonly isolated followed by *Klebsiella pneumoniae* (17.31%), *Pseudomonas aeruginosa*(15.38%), *Enterococcus faecalis*(11.54%), *Candida*(9.61%), *Proteus*(5.77%), and *MRSA*(3.85%). From **Blood** culture *Klebsiella pneumoniae*(25.25%) is a commonest organism isolated followed by *MSSA*(18.52%), *E.coli*(13.80%), *CONS*(12.12%), *Candida*(8.42%), *MRSA*(6.73%), *Pseudomonas aeruginosa*(4.71%), *Acinetobacter baumannii* (2.86%), *Citrobacter*, *Proteus*, *Enterobacter*, *Enterococci*, and *Salmonella*. From **Endotracheal secretion** *Pseudomonas+Klesiella*(31.65%) most commonly isolated organisms followed by *Pseudomonas aeruginosa*(16.88%), *Klebsiella pneumoniae*(12.66%), *Candida*(11.39%), *Acinetobacter baumannii*(10.55%), *Citrobacter freundii*(4.22%), *MRSA*(4.22%), *Enterobacter* (3.79%), *MSSA*(2.53%), and *Enterococci*(2.10%). Out of total gram negative isolates 65-70% strains were ESBL producers and (20.28%) were AmpC beta-lactamase producers. The most common infections were ventilator-associated pneumonia (80.33%) followed by urinary tract infections (38.83%) and blood stream infections (36.64%)^[2]. Our findings correlate with the study done at tertiary care centre of Saudi Arabia.^[2]

Discussion:

The main aim of this study is to make aware about commonest bugs isolated from different specimens and their sensitivity pattern so that indiscriminate use of antibiotics and arousal of antibiotics resistant in bugs can be prevented. Study also help to know about prevalence of ESBL and AmpC beta lactamase producing bugs in the hospital.

Table 1

Organisms	Number Isolates	of ESBL producing	AmpC producing
<i>E.coli</i>	272	180(66.18%)	30(11.02%)
<i>Klebsiella pneumoniae</i>	270	190(70.37%)	50(18.52%)
<i>Pseudomonas aeruginosa</i>	148	85(57.43%)	50(33.78%)
<i>Citrobacter spp</i>	24	15(62.5%)	5(20.83%)
<i>Acinetobacter baumannii</i>	42	15(35.71%)	20(47.61%)
<i>Proteus spp.</i>	43	28(65.12%)	7(16.28%)
<i>Enterobacter spp</i>	15	7(46.66%)	2(2.67%)
<i>Salmonella spp</i>	06	-	-
<i>Klebsiella Pseudomonas</i>	+ 75	40(53.33%)	15(20%)
Total	895	560	179

Amongst the total 895 Gram negative isolates we have detected 560 (62.57%) ESBLs and 179 (20%) isolates as possible AmpC producers resistant to Cefoxitin. Our findings co relates with the study at Saudi Arabia ^[2] and At Chennai ^[3]. Further investigation of this phenotypic screening method for identifying possible AmpC producers seems warranted. In the present study we detect *E.coli* (66.18%), *Klebsiella pneumoniae* (70.37%), *Pseudomonas aeruginosa* (57.43%), *Citrobacter spp* (62.5%), *Acinetobacter baumannii* (35.71%), and *Proteus spp* (65.12%), *Enterobacter spp* (46.66%), and combined *Klebsiella* and *Pseudomonas* (53.33%) are ESBL producing, whereas (11.02%) *E.coli*, (18.52%) *Klebsiella pneumoniae*, (33.78%) *Pseudomonas aeruginosa*, (20.83%) *Citrobacter spp.*, (47.61%) *Acinetobacter baumannii* and (16.28%) *Proteus species* (2.67%) *Enterobacter spp.*, and (20%) combined *Klebsiella* and *Pseudomonas* were found to produce AmpC betalactamase. Gram negative isolates from Urine and Endotracheal secretion showing more resistant than those from Blood. Study shows that incidence of ESBL and AmpC betalactamase production most commonly detected in Enterobacteriaceae family group of organisms like *E.coli*, *Klebsiella*, *Proteus*, *Enterobacter spp* etc. ^[4] Prevalence of

ESBL and AmpC producers amongst total Gram negative organisms were (62.57%) and (20%) respectively [5].

Table 2

Organisms	Number of Isolates
MRSA	70(21.28%)
MSSA	116(35.25%)
CONS	72(21.88%)
Enterococci	71(21.58%)
Total	329

Amongst total Gram positive isolates we have detect MRSA (21.28%), MSSA (35.25%), CONS (21.88%), and Enterococci (21.58%). The prevalence of MRSA was significantly different among various clinical specimens 25% from Urine samples, 21.92% from Blood and 47.61% from endotracheal secretion [6]. We could not detected any VISA and VRE during our study period.

Conclusion:

The present study emphasizes the high prevalence of multidrug resistant organisms producing β -lactamase+ AmpC betalactamase enzymes belongs to Enterobacteriaceae family. To combat these problems, epidemiological studies should be undertaken in hospital settings to monitor the source of infection early detection of these β -lactamases in a routine laboratory could help to avoid treatment failure. Further more strict antibiotic policies and measures to limit the indiscriminate use of Cephalosporins and Carbapenems in the hospitals should be under taken to minimize the emergence of this β -lactamase producing organisms. [7]

Acknowledgement:

We appreciate the help of Dr I.M.Desai, Dr Anil Chadha, for providing the guidance.

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7

EFFECT OF RAJYOGA MEDITATION OVER HIGH BLOOD PRESSURE

Dr. Neeta A. Patel ,Reader (Conservative Dentistry & Endodontics) ,AMC Dental College LG Hospital Maninagar Ahmedabad 380008

ABSTRACT:

To evaluate effect of Rajyoga meditation in hypertensive patients.

INTRODUCTION

Numerous scientific investigations have undoubtedly proved that psychosomatic diseases are increasing day by day in developing country like India especially hypertension and heart diseases. It has been now universally accepted that meditation have effective role in lowering the stress. H.T. is one of the life style disease. So meditation techniques are ideal for improving one's ability to withstand stressful stimuli. Rajyoga Meditation is one of the effective tool for prevention as well as management of stress in hypertensive patients and in cure of essential hypertension.

- Rajyoga Meditation is the science and art of harmonizing spiritual mental and physical energy through connection with the ultimate source of spiritual energy called the supreme soul.
- It is the state of soul consciousness and positive life style.

MATERIAL & METHODS

50 patients suffering from high blood pressure were selected randomly between age of 40 to 70 years who were under treatment of anti-hypertensive drugs. They were enrolled for Brahmakumaris Rajyoga Meditation training for 60 minutes daily for duration of 8 weeks at L.G. Hospital, A.M.C. Met Medical College, Maninagar, Ahmedabad. Both Systolic and Diastolic blood pressure were recorded before Rajyoga Training and monthly interval during training period. 50 individual were also taken under control group who were not undergone Rajyoga training.

- Blood pressure was measured by trained medical doctor in sitting position after 10 minutes of relaxation.

TABLE - 1
METHODOLOGY

Site	:	L.G. Hospital, Maninagar Ahmedabad, Gujarat, India
Period of Study	:	8 Weeks
No. Of Patients	:	Total 100 50 Trained for Rajyoga Meditation 50 Control group
Duration of Meditation	:	60 Minutes Daily For 8 weeks
Inclusion Criteria	:	Age at 40-70 years male and female both confirmed cases of Essential H.P. under antihypertensive medication
According To JNC - 7 Report	:	Normal SBP<120 mm Hg DBP<80 mm Hg

RESULTS

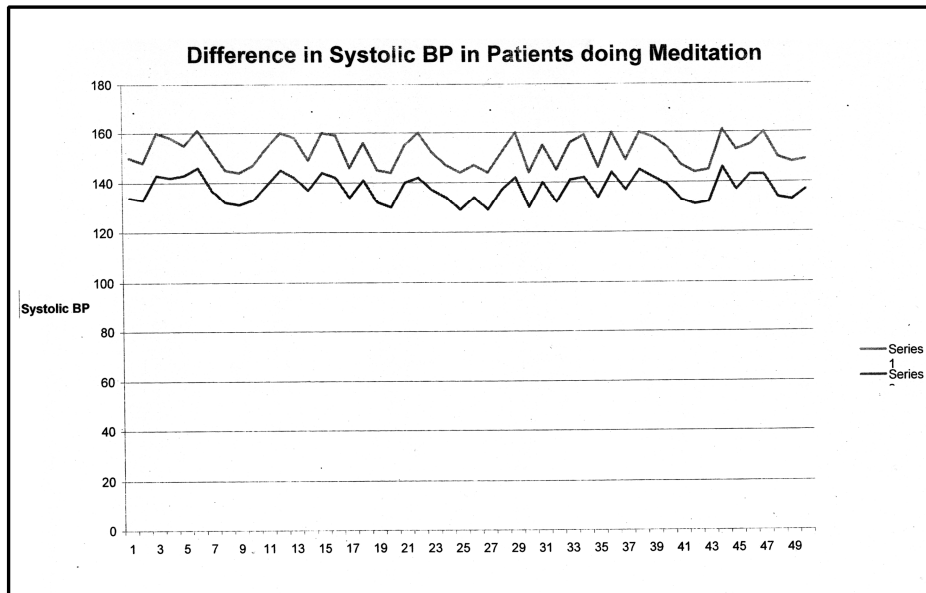
Results were recorded after 8 weeks of study & there was significant reduction in Systolic High Blood Pressure. There was average reduction of 14 mm Hg in Systolic Blood Pressure and 6 mm Hg in Diastolic Blood Pressure after 8 weeks of Rajyoga Meditation.

- There was not much difference found in Blood Pressure of control group patients.
- The statistical analysis was done by Wilcoxon matched pair Signed Rank Test (P<0.0001)

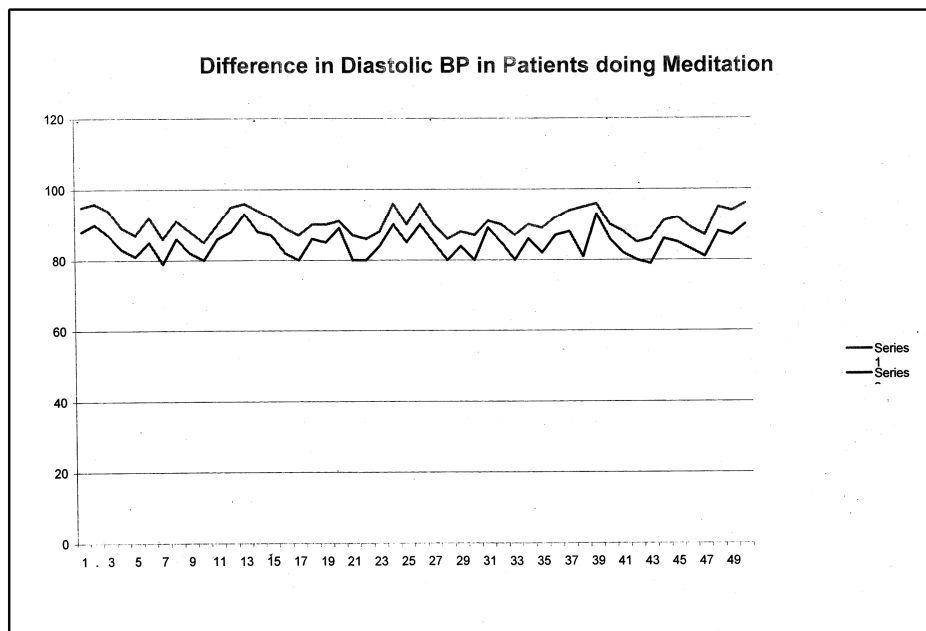
Table - 2

Statistical Analysis							
Patient Doing Meditation							
Systolic Blood Pressure (mm Hg)				Diastolic Blood Pressure (mm Hg)			
Before Meditaton		After Meditation		Before Meditaton		After Meditation	
Average BP	SD	Average BP	SD	Average BP	SD	Average BP	SD
152.22	6.02	137.58	5.08	90.56	3.42	84.82	3.76
P< 0.0001				P< 0.0001			
Statistical Analysis							
Patient Not Doing Meditation (Control group)							
Systolic Blood Pressure (mm Hg)				Diastolic Blood Pressure (mm Hg)			
Before		After		Before		After	
Average BP	SD	Average BP	SD	Average BP	SD	Average BP	SD
153.9	5.82	153.8	5.71	90.82	3.5	91	3.55
P= 0.59				P= 0.44			
* Test applied: Wilcoxon Matched Pairs Signed Rank Test							

Graph -1



Graph -2



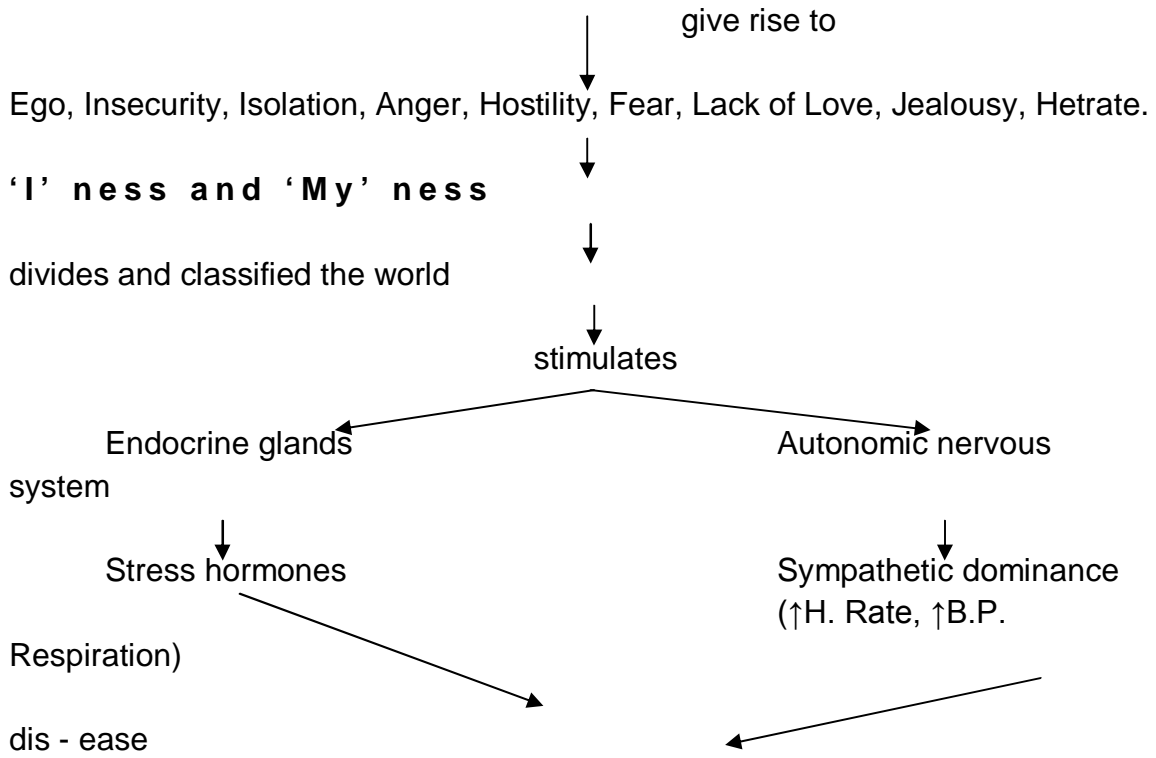
DISCUSSION

The present study was initiated on the hypothesis that sustained high blood pressure in essential Hypertensive Patients is basically due to increasing stress day by day and negative life style. Rajyoga help to built up physical resistance, emotional harmony and balance in life through eradication of root cause in mind. Scientific study has shown that the blood lactate level comes down 3 times less

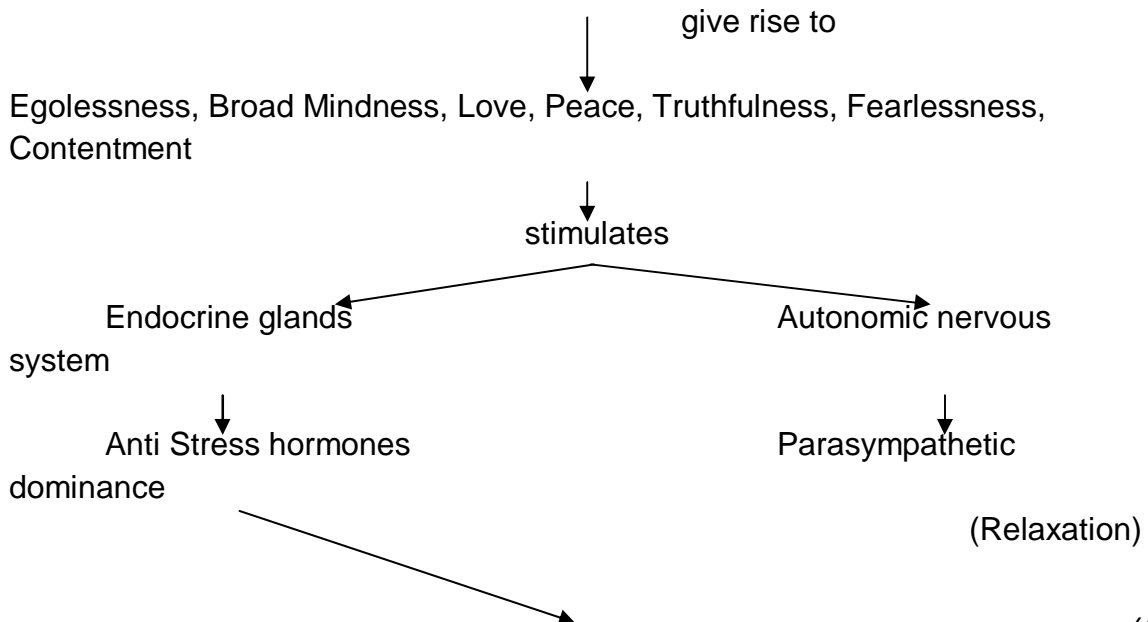
after Rajyoga Meditation which helps in lowering down the H.B.P. (Arther J Vandar 1976.)

- Also it is scientifically proved that after Rajyoga meditation person gets deeply relaxed so that nor epinephrine level comes down. Which ahs important role over blood pressure and heart attack.

Modern Life Style (Body Consciousness)



MEDITATION (Soul Consciousness)





CONCLUSIONS

Effects of meditation come in many different forms from psychological effects of meditation to the physiological effects of meditation. Although there have been many different studies in to the effects of meditation have been recently started to take notice by professionals in the field of the medical science. The positive effect of meditation in some cases is accepted and they have started to prescribe the use of meditation to the patients along with medicine. Although no ideal drugs or method has so far been discovered in science which neutralize the offending factors or root causes. This is non invasive, non drug type of method advocated by physicians which reduces the amount of medication and helps in preventing the diseases.

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8

CALCULATION OF CANAL/BODY RATIO FOR LUMBAR SPINAL CANAL IN DRIED VERTEBRAE IN GUJARAT.

Author(s): Kanani SD, Nirvan AB, Patel JP, Shah RK, Dave RV

Kanani SD, Nirvan AB*, Patel JP, Shah RK***, Dave RV+**

PSMC, Karamsad, *GMERS, Sola, **NHL MMC, Ahmedabad & *** GCS Medical College, Ahmedabad, +B.J. Medical College, Ahmedabad,

Abstract: Inter-pedicular distances of vertebral canal and width of lumbar vertebrae at levels L₁ to L₅ was measured in dry vertebrae of 63 subjects (32

male, 31 female) from Gujarat of age group 35 to 80 yrs. Mean transverse diameter (Inter-pedicular distance) is minimum at L₁ (22.6 mm in male and 21.3 mm in female) and maximum at L₅ (27.0 mm in male and 26.4 mm in female) showing a gradual increase from level L₁ to L₅. Mean width of the vertebral body is minimum at L₁ (36.3 mm in male and 31.6 mm in female) and maximum at L₅ (46.0 mm in male and 42.8 mm in female) showing a gradual increase from level L₁ to L₅. The canal/body ratio is range from 0.58 to 0.62 in male and 0.61 to 0.67 in female. Ratio between transverse diameter of vertebral canal and transverse diameter of the corresponding vertebral body does not seem to be constant at all lumbar level in both the sexes.

Key words: Inter-pedicular distance, Lumbar vertebrae, Spinal canal, width of vertebral body.

Introduction:

Various causes have been attributed to low backache, but lumbar spinal canal stenosis as a causative factor is of great interest in "lumbar stenosis" especially in the extent to which the cauda equina may be compressed within the lumbar spinal canal by constriction or narrowing of the bony ring of the canal, in contrast to impingement by soft tissues. Stenosis due to decreased sagittal diameter has been reported in the cervical spine as well as in the lumbar spine. It has been suggested that reduced inter-pedicular distance is one of the cause of primary narrowing of the spinal canal (Nelson, 1973). The calculation of canal/body ratio for the different segments can also help in specifying whether an individual's measurement on spinal canal are within normal limits for the respective body size or not, thus, helping to identify a stenosis or dilatation of the spinal canal. The present study aims to examine the relationship of the width of the vertebral body with inter-pedicular distance of the lumbar spinal canal in Gujarati population measured in dried bone.

Materials and Methods:

Sixty-three adult skeletons belonging to Gujarati population from the department of Anatomy of different Medical and Dental colleges of Gujarat were used for the study. Age at death ranged from 35 to 80 years. All skeletons were of known sex. Three hundred and fifteen complete vertebrae were available for study. All measurements were made by using Electronic Digital Vernier Calipers and were recorded to the nearest hundredth of a millimeter. Keeping in view the aims of the study, following observations were made on dry bone:

1. Transverse diameter of the lumbar spinal canal was measured as the minimum distance between the medial surfaces of the pedicles of a given vertebra (Inter-pedicular distance) (Jones & Thomson, 1968).

2. Transverse diameter of the vertebral body was measured as the minimum distance across the waist of the vertebral body, which is between its upper and lower border.
3. Observations were made on the skeletal material to determine the nature and incidence of alterations the anatomy, whether pathological or normal variation, including “arthritic” osteophytosis, lumbarization of first sacral vertebra, sacralization of fifth lumbar vertebra, sacro-transverse joints, spina bifida, wedge compression vertebral bodies, and trefoil or “maple-leaf” configuration of the lumbar canal.

From the above measurements, mean values and standard deviation were computed for each vertebral level, separately for each sex. The ratio of the transverse diameter of the canal to the width of the vertebral body was calculated (canal/body ratio) for all lumbar segments. Width of the vertebral body is an index of body size. A definite relation exists between width of the body and the transverse diameter (IPD) of the spinal canal at all lumbar levels, Amonoo Kuofi (1982). By calculating this ratio, it is possible to determine whether an individual's measurements are within normal limits for the respective vertebral body size or not.

Observation:

Table – 1 show mean inter-pedicular distances (IPD in mm.) and standard deviation (S.D.) of the lumbar spinal canal of male and female adult Gujaratis. The inter-pedicular distance at L₁ is 22.6, L₂ is 23.3, L₃ is 23.8, L₄ is 24.1, L₅ is 27.0 in male. The inter-pedicular distance at L₁ is 21.3, L₂ is 21.8, L₃ is 22.5, L₄ is 23.3, L₅ is 26.4 in female. The value of standard deviation at L₁ is 0.97, L₂ is 1.09, L₃ is 1.14, L₄ is 1.80, L₅ is 1.78 in male. The value of standard deviation at L₁ is 1.31, L₂ is 1.18, L₃ is 1.17, L₄ is 1.58, L₅ is 2.47 in female. The IPDs shows gradual increase in both sexes from L₁ to L₅. The value of standard deviation is highest at fourth lumbar level in male and fifth lumbar level in female, suggesting greater variation in the size of inter-pedicular distance at fourth and fifth lumbar level respectively.

The ratio between IPD of spinal canal and width of the vertebral body was calculated for all five lumbar levels (Table-2). The width of vertebral body at L₁ is 36.3, L₂ is 37.4, L₃ is 39.6, L₄ is 41.6, L₅ is 46.0 in male. The width of vertebral body at L₁ is 31.6, L₂ is 33.36, L₃ is 35.1, L₄ is 37.7, L₅ is 42.8 in female. The canal/body ratio at L₁ & L₂ is 0.62, L₃ is 0.60, L₄ is 0.58, L₅ is 0.58 in male. The canal/body ratio at L₁ is 0.67, L₂ is 0.65, L₃ is 0.64, L₄ is 0.61, L₅ is 0.61 in female. The results indicate that although width of the vertebral body and mean IPD of the spinal canal was showing a steady cranio-caudal increase from L₁ to L₅ but the ratio between two traits does not remain constant at all levels like in case of radiographic study(0.6) observed by Chhabra, S at el (1991).

Discussion:

In the present study attempt has been made to determine standard normal minimum IPD as a preliminary to clinical investigation of transverse spinal canal stenosis. It has been found that the reduction of coronal diameter of the lumbar spinal canal, caused by reduction in the inter-pedicular distance, is second most common cause of narrowing of the lumbar spinal canal after the reduction in the sagittal diameter, caused by short pedicles. So, we undertook the determination of normal inter-pedicular distance standard to detect spinal canal stenosis. Earlier study of canal/body ratio in plain antero-posterior radiographs shows that C/B ratio remain constant (0.6). As the age group selected for the present study is very much same as the age group used for earlier such studies, the ethnic differences in the trait could be well compared. Hinck et al. (1966) have shown that before the age of 19 years, the lumbar spinal canal is distinctly narrower than it is in the adult. Inclusion of such young subjects in the sample could result in lowering of the value of mean IPD and mean width. So dried bone of normal adults skeleton aged 35 years and above, were included in the study.

95 percent tolerance range is expected to contain 95 percent of the normal population. Any transverse diameter falling outside this range has to be viewed critically. There is considerable overlapping of the ranges of male and female. This probably reflects the wide variations of body sizes among the male and female subjects.

Table – 1 show mean inter-pedicular distances (IPD in mm.) and standard deviation (S.D.) of the lumbar spinal canal of male and female adult Gujaratis. The inter-pedicular distance gradually increases from L₁ to L₅. It is minimum at L₁ and maximum at L₅. In case of male, the value of standard deviation increases from L₁ to L₅. In case of female, the value of standard deviation is higher at L₁ then at L₂ and L₃, but shows constant increase from L₂ to L₅. The value of standard deviation is highest at fourth lumbar level in male and fifth lumbar level in female, suggesting greater variation in the size of inter-pedicular distance at fourth and fifth lumbar level respectively.

The ratio between IPD of spinal canal and width of the vertebral body was calculated for all five lumbar levels (Table-2). The results indicate that although width of the vertebral body and mean IPD of the spinal canal was showing a steady cranio-caudal increase from L₁ to L₅ but the ratio between two traits does not remain constant at all levels like in case of radiographic study(0.6). The ratio of inter-pedicular distance and width of vertebral body ranges from 0.58 to 0.62 in male and 0.61 to 0.67 in female. It is evident from table-2 that width of vertebral body also increases from L₁ to L₅, like inter-pedicular distances.

The increase of IPDs of Gujarati female is of pattern similar to that of the male but of a slightly smaller magnitude. A comparison between the present data and the data published data on inter-pedicular distance at lumbar levels of other

populations also shows that there are marked differences between the mean values reported for the population of different geographic areas. The reasons for these differences are not clear, but interplay of racial, ethnic and environmental factors cannot be ruled out.

Variations can occur in relation to general somatic size within a population. But transverse diameter of the spinal canal at any segmental level is proportional to the width of the vertebral body at that level (Jones & Thomson (1968), Amonoo Kuofi (1982) and Weisz & Lee (1983)). This observation can not be confirmed in dried bone study of Gujarati population. The observation is significant so that clinicians while assessing the size of the spinal canal from antero-posterior radiographs need not take into consideration variables like built of the individual and X-ray magnification factor. Calculation of canal/body ratio for different segments can also help in specifying whether an individual's measurement on spinal canal are within the normal limits for respective body size or not, thus, helping to identify stenosis or dilatation of the spinal canal.

Table-1: Mean inter-pedicular distances (IPD in mm.) and standard deviation (S.D.) of the lumbar spinal canal of male and female adult Gujaratis.

Level	Mean inter-pedicular distance (mm)			
	Male		Female	
	IPD	± S.D.	IPD	± S.D.
L ₁	22.6	0.97	21.3	1.31
L ₂	23.3	1.09	21.8	1.18
L ₃	23.8	1.14	22.5	1.17
L ₄	24.1	1.80	23.3	1.58
L ₅	27.0	1.78	26.4	2.47

Table-3: Relationship between the width of the vertebral body (W, in mm.) and mean IPD (in mm.) of the lumbar spinal canal (canal/body ratio = C/B) obtained from dried bone of both sexes in present study.

Level	Male			Female		
	IPD in mm	W in mm	C/B mm	IPD in mm	W in mm	C/B mm
L ₁	22.6	36.3	0.62	21.3	31.6	0.67
L ₂	23.3	37.4	0.62	21.8	33.36	0.65
L ₃	23.8	39.6	0.60	22.5	35.1	0.64
L ₄	24.1	41.6	0.58	23.3	37.7	0.61

L ₅	27.0	46.0	0.58	26.4	42.8	0.61
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9

CORELATION OF PLACENTAL WEIGHT AND FETAL OUTCOME IN PREGNANCY INDUCED HYPERTENSION

Sumit Gupta*, **Parul Gupta****

Tutor in Department of Anatomy, ** Assistant Professor in Department of Obstetrics & Gynaecology, SSG Hospital & Medical College, Baroda, Gujarat
390 001

Abstracts:

Placenta is a choriodecidual structure developed during pregnancy and is the organ of exchange between the foetus and mother for the purpose of physiological exchange. A study of placental morphology is an indicator of the fact that whether the foetus was compromised in intrauterine life. It also acts as an effective index by examination of

which we can predict the status of foetus in neonatal life as it can act as an indicator to the overall development of the foetus in cases of pregnancy induced hypertension.

Key Words: Placenta, Placental weight, fetal weight.

Author for correspondencet. E- mail: dr_sumitgupta@yahoo.co.in

Introduction:

Mother and Fetus are the two important ends of reproduction. Mother and Fetus come in close contact with each other by a vital organ – “**The Placenta**”.

Placenta is the most accurate record of the infant’s prenatal experience. After delivery if the placenta is examined minutely it provides much insight into the prenatal health of the baby and the mother. In recent years placenta has drawn attention as valuable indicator for maternal and fetal diseases. Pregnancy complications which are associated with high perinatal morbidity and mortality are reflected in the placenta in a significant way (both macroscopically and microscopically).

Morphologically placentae of hypertensive disorders of pregnancy are lighter in weight, lesser in diameter and thickness, with high incidence of abnormal shape and cord insertion and the fetoplacental ratio is diminished.

Foetal outcome is adversely influenced by pathological changes observed in placenta.

Material and Methods:

The present study is a prospective study in which a total of 200 placentae i.e., 100 placentae from cases of hypertensive disorder of pregnancy and 100 placentae from normal cases between 36 to 42 weeks of gestation, attending the SSG Hospital attached to Medical College, Vadodara were studied.

Inclusion Criteria:

Control Group-

- Systolic B.P. <140 mm Hg,
- Diastolic B.P. < 90 mm Hg.
- No Oedema
- No Proteinuria
- Pre-eclampsia-
 - Systolic B.P. ≥140 mm Hg,
 - Diastolic B.P. ≥ 90 mm Hg.
 - With and without Oedema and/ or Proteinuria
- Eclampsia
 - Convulsions with Pre-eclampsia
- Singleton pregnancy
- Gestational age 36-42 weeks.

Exclusion Criteria:

- Gestational age < 36 weeks
- Gestational age > 42 weeks
- Multiple pregnancies.

Detailed obstetric and medical histories were taken for all cases, clinical examination done and they were subjected to urine sugar and albumin, Hb%, Blood grouping and Rh typing.

Just after delivery all the placentae were collected in a clean tray. The membranes and cord at their attachment to the placenta were cut off. The placenta was gently expressed so as to remove its blood content and then washed thoroughly under tap water, mopped with dry cotton pad and weighed.

At the time of delivery fetal birth weight was noted.

Comparison between the study groups was analysed by chi square test.

Result:

Following tables shows the observations made during the study.

In the present study a total of 200 placentae were studied, out of which 100 placentae were collected from pregnancy induced hypertension and 100 placentae from normal cases as control. Among 100 cases of PIH 70 belong to mild PIH and 30 belongs to severe PIH category. Following tables shows the observations made during the study.

Table 1: Comparison of weight of the placentae in different groups:

S r	Wt of placenta(gms)	Control		PIH			
		No. Of cases	%	Mild		Severe	
				No of cases	%	No of cases	%
1	<200	0	0	0	0	1	3.33
2	200-300	12	12	9	12.86	8	26.67
3	300-400	10	10	32	45.71	15	50.0
4	400-500	40	40	19	27.14	4	13.33
5	500-600	32	32	10	14.29	2	6.67
6	>600	6	6	0	0.0	0	0.0
Total		100		70		30	

Table 2: observation of weight of the placentae in different groups and its statistical analysis:

Observation	Control	Mild PIH	Severe PIH
Mean wt of	481.5	415.71	365

placenta(gms)			
Max. wt of placenta(gms)	650	600	550
Min. Wt of placenta(gms)	250	250	200
Co efficient of variation	22.27	22.01	24.17
Standard deviation	107.22	91.5	88.23
Statistical parameter	Chi square- 54.95, df-10, P<0.005		

Placental weight in the present study varies between 250 to 650 in control group with mean wt of placenta 481.5 gms. In Mild PIH group it varies between 250 to 600 gms. with mean wt. of placenta 415.7 gms. In Severe PIH group it varies between 200 to 550 gms. with mean wt. of placenta 365 gms.

Placental wt shows marked variation in all the groups and coefficient of variation was higher in severe PIH group but mean weight was less with increased severity of PIH. The observations were tested statistically by chi square test and the chi square value is 54.95 with P<0.005 which shows that difference between the mean weight of placenta in different groups is due to severity of PIH and not by chance.

Graph:1 Relation of Placental weight with severity of Pregnancy Induced Hypertension (Distribution in %)

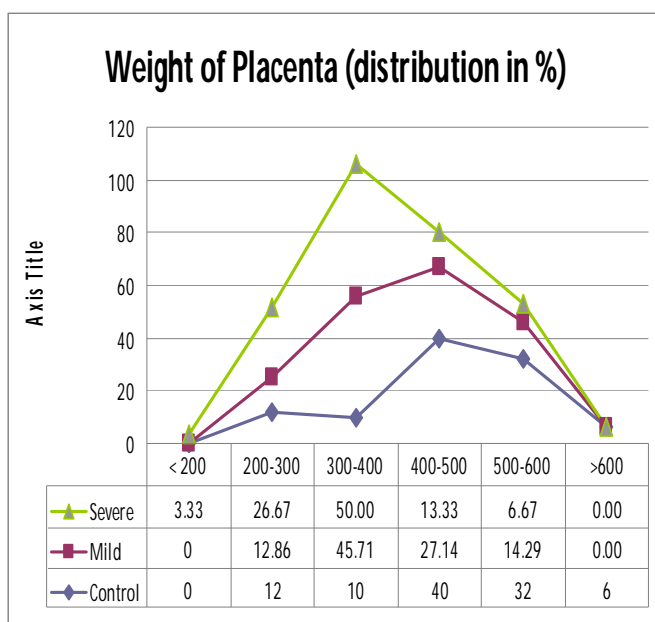


Table 3: Comparison of weight of baby in different groups:

Sr	Wt of Baby	Control	PIH

	(gms)	No. Of cases	%	Mild		Severe	
				No of cases	%	No of cases	%
1	<1000	0	0	1	1.43	2	6.67
2	1000-1500	4	4	3	4.29	5	16.67
3	1500-2000	8	8	8	11.43	9	30.0
4	2000-2500	21	21	28	40.00	8	26.67
5	2500-3000	58	58	25	35.71	4	13.33
6	3000-3500	9	9	5	7.14	2	6.67
Total		100		70		30	

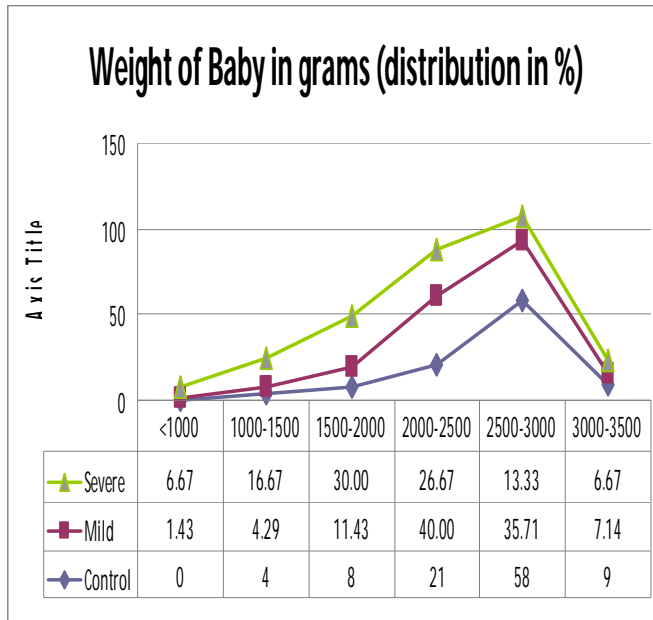
Table 4: observation of weight of the placentae in different groups and its statistical analysis:

Observation	Control	Mild PIH	Severe PIH
Mean wt of baby(gms)	2587	2379	2030
Max. wt of baby(gms)	3500	3500	3500
Min. Wt of baby(gms)	1100	1000	800
Co efficient of variation	17.99	21.92	32.88
Standard deviation	465.29	521.4	667.55
Statistical parameter	Chi square- 39.93, df-10, P<0.005		

Birth weight of Baby in the present study varies between 1100 to 3500 in control group with mean wt of Baby- 2587 gms. In Mild PIH group it varies between 1000 to 3500 gms. with mean wt. of Baby- 2379 gms. In Severe PIH group it varies between 800 to 3500 gms. with mean wt. of Baby 2030 gms.

Baby wt shows marked variation in all the groups and coefficient of variation was increased with severity of PIH and mean weight was less with increased severity of PIH. The observations were tested statistically by chi square test and the chi square value is 39.93 with P<0.005 which shows that difference between the mean weight of babies in different groups is due to severity of PIH and not by chance.

Graph 2: Relation of Baby weight with severity of Pregnancy Induced Hypertension (Distribution in %)



Discussion:

Hypertensive disorders of pregnancy are one of the leading causes of maternal morbidity/ mortality and perinatal morbidity /mortality.

The aetiopathogenesis of hypertensive disorders of pregnancy still remains a subject of controversy. The classical view in this regard focuses on the placenta and the utero placental circulation.

Although the study of the placenta is, retrospective in nature, yet it provides a reflection of hazards the foetus has been subjected to during its growth and development.

Normally a placenta weighs from 400 to 800gms. This study observed the reduction of placental weight in the hypertensive disorders. Bandana Das et al³ (1996), Sharma et al⁷ (1981), Dutta et al⁶ (1989) and Nobis & Das et al⁵(1991) also reported the same findings.

In the present study placental weight varies between 250 to 650 gms. The mean placental weight was found to be of 481.5 gms in control group of present study while it was 485.85 gms. in study of Majumdar S and Dasgupta H et al⁹ (2005).

In the present study the mean placental weight in mild PIH was 415 gms. and in severe PIH 365 gms. It is in conformity with the findings of Chakravorty because in study conducted by Chakravorty et al⁸ (1967) it was 410 gms in mild and 350 gms in severe PIH.

In the present study birth weight of babies varies between 1100 to 3500 gms. In control group with mean birth wt of 2587 gms. whereas in Mild PIH it varies

between 1000 to 3500 gms, with mean wt 2379 gms. and in severe PIH it varies between 800 to 3500 gms. with mean wt 2030 gms. Thus in the present study the birth wt of baby was found to be decreased with increasing degree of severity of PIH and this decrease was found statistically significant. Chakravorty et al⁸ (1967), Majumdar S and Dasgupta H et al⁹ (2005) also found similar type of observations.

There is a linear relationship between Placental weight and Birth weight of baby that can be expressed by placental coefficient or foeto placento ratio. In the present study Placental coefficient (Placento foetal ratio) was taken. Although the mean Placental Coefficient was same in severe PIH and control group but the range is wider in severe PIH as compared to control group and coefficient of variation was higher in severe PIH group.

Conclusion:

Placental weight shows marked variation in all the groups and coefficient of variation was higher in severe PIH group but mean weight was less with increased severity of PIH. Baby weight shows marked variation in all the groups and coefficient of variation was increased with severity of PIH and mean weight was less with increased severity of PIH.

From the present study it can be concluded that, the pregnancy induced hypertension adversely influences the weight of the placenta and foetal outcome. Thus placenta acts as an effective index by examination of which we can predict the status of Foetus in neonatal life as it can act as an indicator to the overall development of the Foetus in PIH cases.

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CANDIDA SPECIES IDENTIFICATION FROM CLINICAL SPECIMENS AND ITS CHANGING PATTERN IN A TERTIARY CARE HOSPITAL

Dr. Jayshri D. Pethani*, Dr. Jigar Gusani**, Dr. Sanjay Rathod*, Dr. Parul D Shah***

*Associate Prof. , Smt.N.H.L.Medical college, **Second year resident,

Smt.N.H.L.Medical college, ***Prof. & Head, Smt.N.H.L.Medical college Ahmedabad.

ABSTRACT

The object of the Study was to isolate & identify Candida species from various routine culture specimens and prevalence of fluconazole resistance among them which will guide the clinician towards appropriate management. During the three months of duration total 62 (1.73%) yeast like cells were isolated from total 3580 routine culture specimens. All were processed by using Gram stain, germ tube, carbohydrate assimilation, chromogenic agar medium, SDA broth, microscopic morphology on cornmeal agar (By Dalmau culture). Susceptibility to fluconazole disc (25 µg/disc) was done. Out of 62 isolates 27(43.54%) were *C.tropicalis*, 19(30.64%) *C.albicans*, 7(11.29%) *C.guilliermondii*, 5(8.06%) *C.parapsilosis*, 3(4.84 %) *C.kefyr*, 1(1.62%) *C.glabrata*. Thus non albicans were the major isolates. Neonates were at higher risk of developing candidemia. Surprisingly all the isolated *C.guilliermondii* were from blood culture of neonates. Fluconazole resistance was more among albicans (58%).

KEYWORDS: Candida spp., Sabouraud Dextrose Agar, Fluconazole resistance

INTRODUCTION

Candida is common fungal pathogen isolated from clinical specimens. They are component of normal flora of human beings.^[1,3]

Candidemia is found mainly in individuals with some immunocompromised condition.^[1,3]

Candida can cause simple mucocutaneous lesion to even life-threatening systemic infections. Management of life-threatening candidiasis remains hampered by delays in diagnosis and the lack of reliable diagnostic methods.

Predisposing factors for candida infection are: Prolonged use of antimicrobial agents, immunocompromised status, chemotherapy, catheterization.^[3,4,5,8]

There is surge in the frequency of non-albicans candida isolated and antifungal resistance.^[1,10] It requires candida species identification and perform their antifungal sensitivity for correct diagnosis and proper treatment.

MATERIALS AND METHODS

Duration of the study was from 16th MAY to 13th AUG-2011. During this period all the clinical samples received for routine culture and sensitivity were screened for budding yeast like cells with the help of gram stain, 10 % KOH, and colonies on routine culture media.

1st DAY FOLLOW UP

- a. Gram stain^[1]
- b. Streaking on Sabouraud Dextrose Agar^[1]

Incubated for 24 hours at 25⁰ C. ^[1,2]

Candida stain Gram positive^[1,2].

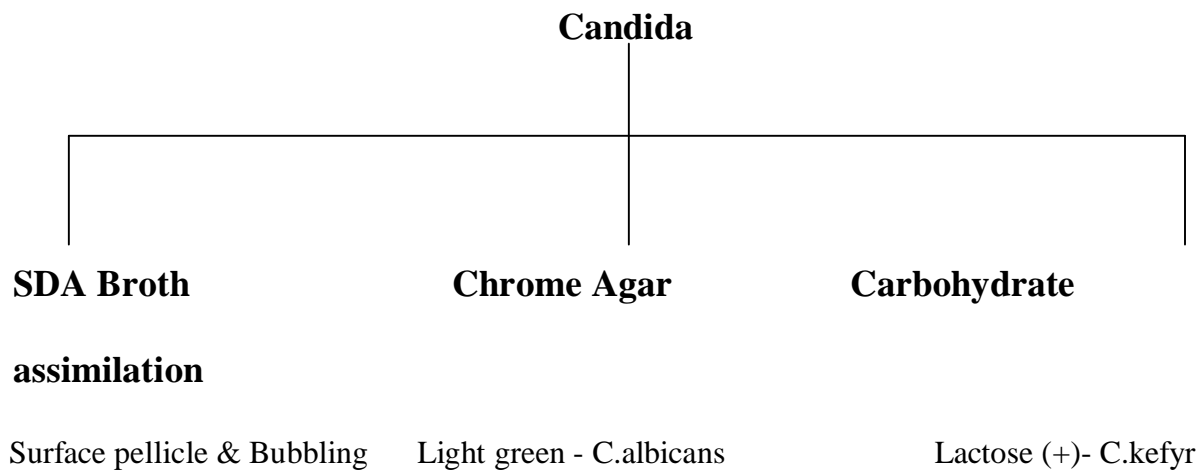
2nd DAY FOLLOW UP

- a. Germ tube test was performed.^[1,2]
- b. Streaking on chrome agar.^[1,2]
- c. Sugar assimilation (glucose, lactose, sucrose, maltose, trehalose, raffinose, xylose) test was also done on Yeast Nitrogen Base agar.^[1]
- d. Sabouraud Dextrose Broth(SDB) inoculation & incubation at 37⁰ C was done^[1]
- e. Culture on cornmeal agar by dalmau technique & Incubated upto 48 hours at 25⁰ C.
- f. Susceptibility to fluconazole disc(25 µg/disc) was done.(By Disc diffusion method)

3rd DAY FOLLOW UP

- a. Colour on chrome agar was noted.^[12]
- b. Result of SDB for surface pellicle, surface growth, bubbling etc was looked for.
- c. Result of sugar assimilation was observed^[1,2]
- d. Results of microscopic morphology on cornmeal agar were noted.^[2]
- e. Susceptibility to fluconazole was noted.

KEY IDENTIFICATION FEATURES



in *C.tropicalis* Metallic Bluish green - *C.tropicalis* Raffinose(+)&Lactose(-)

)
-*C.guilliermondii*

No change(clear) in Bluish pink - *C.guilliermondii*

C.albicans Creamish to pink- *C.parapsilosis*

Creamish – *C.kefyr*

RESULT

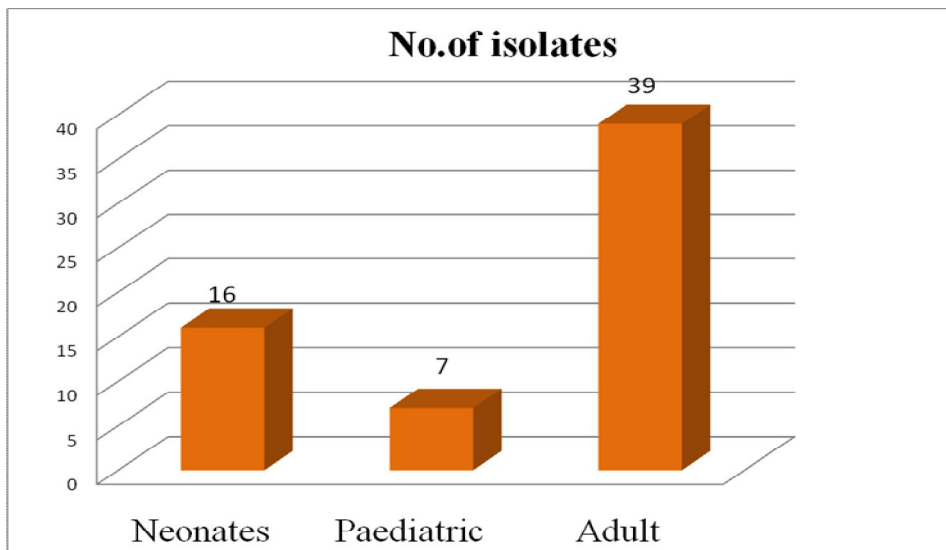
Total 3580 routine culture specimens were received during 16th May to 13th Aug-2011 at our department, of which 62(1.73%) isolates showed yeast like cells.

Table 1: - Distribution of different Species in total specimens:

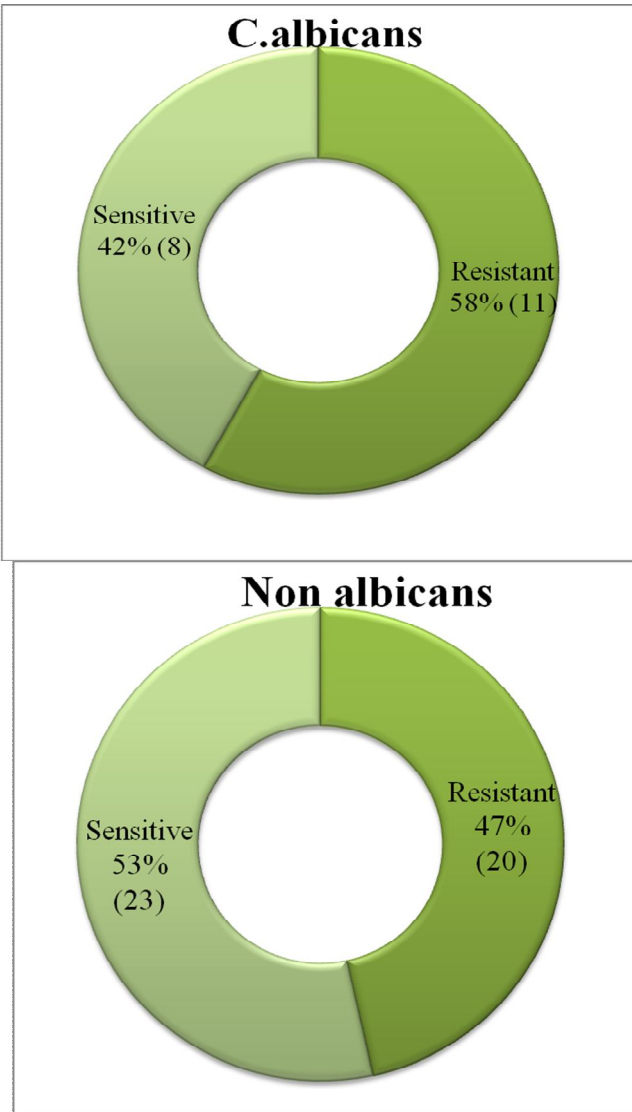
Candida species	No. of Candida positive specimen (total 62)	Percentage
<i>Candida albicans</i>	19	31 %
<i>Candida tropicalis</i>	27	43 %
<i>Candida gulliermondi</i>	7	11 %
<i>Candida parapsilosis</i>	5	8 %
<i>Candia kefyr</i>	3	5 %
<i>Candida glabrata</i>	1	2 %

Table 2: - Distribution of species among various types of specimens.

	C.tropicalis	C.albicans	C.parapsilosis	C.guilliermondii	C.kefyr	C.glabrata
Blood	4	3	4	7	-	1
Urine	13	5	-	-	1	-
Sputum	5	6	-	-	1	-
Swab	3	3	-	-	-	-
Pus	-	-	-	-	1	-
Ascitic fluid	-	-	1	-	-	-
Other	2	2	-	-	-	-



➤ Figure 1 **Distribution within age groups.**



➤ Figure 2 **Fluconazole resistance**

DISCUSSION

Patients admitted at tertiary care hospitals have access to very intensive management modalities. This along with increasing number of immunocompromised patients have led to rise in infections caused by candida especially by non albicans candida.^[1,3,6] Due to

variable clinical presentation of candida infections, it becomes very important to identify this pathogens from all the routine culture specimens received at laboratory irrespective of clinician's suspicion. Candida species differ in their antifungal susceptibility and virulence factors.^[1,6] Thus identification of candida upto species level along with antifungal susceptibility becomes very essential.

In present study, results show that *C.tropicalis*(43.54%) was the major isolate in contrast to previous studies ^[13,14] . Out of 19 blood culture that showed presence of candida,13 (68.42%) were from NICU. Thus the neonates were at higher risk of developing candidemia^[8]. Results of Chrome agar were consistent with *C.albicans* and *C.tropicalis*. While in *C.parapsilosis* & *C.guilliermondii* colour development was variable in total 3 isolates. Sugar assimilation and dalmau techniques were very helpful in species identification when other methods showed variable findings.

The striking feature of the present study was the isolation of all the *C.guilliermondii* from blood culture specimens of neonates, which has not been mentioned in any of the referred studies and requires further detail investigation.^[4,5,6,7,8] Also, all the *C.parapsilosis* were isolated from neonates, which was unusual.^[8]

CONCLUSION

This Study highlights the emergence of non-albicans candida as major isolates and alarming fluconazole resistance in *C.albicans*.So it is indispensable to identify all yeast

isolates up to species level and their antifungal susceptibility. It will expedite specific therapy, reduces morbidity and mortality in patients infected with candida.

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11

EFFECTS OF CHRONIC EXPOSURE OF FORMAIN ON PUMONARY FUNCTION TEST, A COMPARATIVE STUDY AMONG TECHNICIANS WORKING IN DISSECTION HALL AND OTHER LABORATORY.

DR. PUNEET AGGARWAL*, DR RAJULA TYAGI, DR JANARDAN V BHATT**

**DEPT. OF PHYSIOLOGY, Jn Lecturer N.H.L. MEDICAL COLLEGE,
AHMEDABAD, **Asso. Prof,** Prof & Head ,AMCMET Medical college
Ahmedabad 380008**

Correspondence author: drpuneetag@rediffmail.com

ABSTRACT:

It was observed that the technicians working in dissection hall have complains of breathlessness. The occupational hazard of chronic exposure of formalin in hall was postulated. This led to the present study in which pulmonary function test were carried out in technicians working in anatomy and biochemistry laboratory. The pulmonary function test included were vital capacity and peak flow expiratory rate, carried out by Student Spiro meter and Wrights flow meter. The study revealed significant ($p < .0001$) decrease in vital capacity and peak expiratory flow rate of technicians working in gross anatomy laboratory, than technicians working in biochemistry laboratory.

INTRODUCTION:

Formaldehyde or formalin is the simplest aldehyde used in aqueous form to preserve the cadavers in gross anatomy laboratory. The property of the reagent in delaying the decomposition of cadavers is highly used in preservation and embalming of bodies. Formalin is absorbed in body through skin and inhalation. On inhalation, it can be toxic, allergic and carcinogenic. On certain occasion, it can induce asthma as well. Because of occupational hazard, technicians working in gross anatomy laboratory are chronically exposed to ill effects of formalin exposure. We have evaluated pulmonary function test in technicians of anatomy laboratory as case while technicians of biochemistry were taken as control, to assess the effect of formalin on pulmonary function test.

AIMS AND OBJECTIVE:

To study the effect of formalin toxicity on pulmonary function test.

INCLUSION CRITERIA: Technicians working in different medical and dental college were taken for study. Subjects with pre diagnosed medical and pulmonary history were excluded. Subjects were selected having an exposure of formalin for at least last six months working min 4 days a week in laboratory.

MATERIAL AND METHOD: The present study was carried out among 12 healthy technicians from anatomy laboratory and 15 from biochemistry department aged 30-45 years.

Student Spiro Meter was used to measure vital capacity and Wright's peak flow meter was used to measure PEFR. Verbal consent was taken. For statistical analysis, SSPS software was used.

STATISTICAL TESTS:

For statistical analysis, SSPS software was used to measure P value: Test was considered significant if P value is less than 0.5

RESULTS: The mean age of subjects was 40 ± 4.5 years. As shown in the Table, the VC and PEFR shows highly significant decrease in subjects working in anatomy laboratory compared to those working in biochemistry laboratory.

Table : Pulmonary Function Test

	GROUP A Mean ± SD	GROUP B Mean ± SD	P value, .0001
Vital capacity (ml)	2455 ± 342.02	2988± 378.62	Significant
PEFR (ml/sec)	270 ± 14.33	320 ± 18.42	significant
Breath holding (in sec)	36 ± 2	32 ± 1.3	Not significant

Group A : technicians of anatomy

Group B: Technicians of biochemistry

DISCUSSION: Formalin is an irritant gas. The fumes inhaled causes allergic reactions inside lungs. Chronic exposure to formaldehyde has been associated with immunological hypersensitivity as measured by elevated circulating IgG and IgE auto-antibodies to human serum albumin. In addition, a decrease in the proportion of T-cells was observed, indicating altered immunity. The most common symptoms include irritation of the eyes, nose, and throat, along with increased tearing

The present study shows that the various lung functions are significantly reduced in who are chronically exposed to the fumes of formalin. These can be attributed to the adverse effect of formalin on respiratory system. Various studies done earlier revealed that FVC decreased in subjects immediately after their first exposure.

CONCLUSION:

The present study was conducted to evaluate the symptoms caused by formaldehyde fumes that were experienced by the technicians working in the dissection rooms. The probable measures which can be taken will be the lesser concentration of formaldehyde as it will reduce the toxic effects and the other chemicals like surgical spirit, glycerine and carbolic acid will help in maintaining a good preservation of cadavers. As is quoted by BS Mitchell, "reduction in

formaldehyde concentration is not deleterious to specimen preservation, but leads to a safer working environment.

LIMITATIONS

- The study can be extended with more subjects and more pulmonary function test can be evaluated like FEV₁, FVC/FEF etc using a computerized spirometer. More analysis can be done if the disease is restrictive or obstructive pattern. The study was convenience based. Study can be further extended for the functions like lung flow volume curves and expiratory flow rates.
- The study can be useful for establishing whether formalin results in restrictive or obstructive pulmonary disease.

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CASE REPORTS

1

A RARE CASE OF SUDDEN DEATH DUE TO AORTIC DISSECTING ANEURISMAL RUPTURE

Dr. Mohammed Ziyauddin G. Saiyed *, **Dr. Gaurang N. Algotar ***, **Dr. Kalpesh S. Kotaria ****, **Dr. Pratik R. Patel *****

*** (Resident doctors), ** (Assistant Professor), *** (Professor and Head)
Deptt. Of Forensic Medicine, Smt N.H.L. Municipal Medical College,
Ellisbridge, Ahmedabad – 55.**

Abstract :

A young adult having history of hypertension and diabetes mellitus since 6 years, otherwise healthy and non symptomatic, suddenly collapsed while walking at his work place. He was taken to the VS General Hospital, Ahmedabad and was declared dead by the Casualty medical officer. Post mortem examination was carried out at the Mortuary of VS General Hospital. We found rupture of dissecting aneurysm of ascending aorta with fluid and clotted blood in the pericardial cavity causing cardiac tamponade as the cause of death.

Key words : Cardiac tamponade, Dissecting aneurysm, Sudden death

Introduction : Forensic experts deal not only with criminal, accidental and suicidal deaths, but also with wide range of natural deaths especially if they had occurred suddenly in apparently healthy individuals. Many of these deaths are sudden, un expected, clinically un explained or obscure eventhough there may not be any criminal element in their causation. Suspicion usually arises when an individual is found dead without anyone having witnessed the death. Investigation of sudden and unexpected death is a challenge for forensic doctor. The definition of Sudden death varies according to authority and convention. Sudden death is defined as an unexpected, non violent (natural) phenomenon in which death occurs instantaneously or within 6 hours of onset of symptoms or Collapse in non-hospitalised individual participating in their regular activities until the final event^[11].

Case History : A 32 year old, male, patient, known case of hypertension and diabetes mellitus since 6 years, otherwise healthy and non symptomatic,

collapsed while walking at his work place at 8 o'clock in the evening on 18th of July, 2011. Someone saw him lying on the ground and called the ambulance. He was taken to the VS General Hospital, Ahmedabad by 108 ambulance and was declared dead by the Casualty medical officer. After the police reached the hospital and prepared the inquest, post mortem examination was carried out at the Mortuary of VS General Hospital on 19th of July, 2011 at 10.05 am.

Post Mortem Findings :

External :

- It was a dead body of a young male, well built , obese.
- Rigor mortis was well developed in all muscles of the body and post mortem lividity

present over back of body except pressure areas and was fixed.

- There was no mark of any external injury on the body.

Internal :

- Brain and Meninges were congested and oedematous.
- Abdominal cavity was normal with all the viscera congested and oedematous.
- Stomach contained about 40 ml of yellowish fluid mixed with semi digested food particles and its mucosa was congested.
- On opening the thoracic cavity, about 500 ml blood clots were present in pericardial sac.
- Heart was enlarged weighing 700 gm with thickened right and left ventricular walls. There was a tear over inner aspect of posterior wall of ascending aorta, just above aortic valve, transverse, 2x0.2 cm size, layer deep. Layers of aortic wall found loose upto 5 cm from origin of aorta with blood clots present in it. A tear was present over outer aspect of posterior wall of ascending aorta, 1.5 cm distal to its origin, oblique, 1.4x0.2 cm size, layer deep.
- Viscera like Brain, Heart, Lungs, Liver, Spleen and Kidneys were sent for histo pathological examination.
- Histopathological report showed changes of atherosclerosis in both coronary arteries with hypertrophied myocardial muscle fibres. Sections from aorta along with internal and external tear showed ulcerated endothelium with areas of haemorrhage, congestion and mixed inflammatory infiltrate. Sections from cerebral vessels showed changes of atherosclerosis.
- The final opinion stated that Death was due to cardiac tamponade as a result of dissecting aortic aneurismal rupture.

Discussion :

Aortic dissection occurs when a tear in the inner wall of the aorta causes blood to flow between the layers of the wall of the aorta and force the layers apart.^[1] Aortic dissection is a medical emergency and can quickly lead to death, even

with optimal treatment. If the dissection tears the aorta completely open (through all three layers), massive and rapid blood loss occurs. Aortic dissections resulting in rupture have an 80% mortality rate, and 50% of patients die before they even reach the hospital. The vast majority of aortic dissections originate with an intimal tear in either the ascending aorta (65%), the aortic arch (10%), or just distal to the ligamentum arteriosum in the descending thoracic aorta (20%).

Classification systems to describe aortic dissections may be discussed under following headings .

DeBakey : The DeBakey system, named after surgeon and aortic dissection sufferer Michael E. DeBakey, is an anatomical description of the aortic dissection. It categorizes the dissection based on where the original intimal tear is located and the extent of the dissection (localized to either the ascending aorta or descending aorta, or involves both the ascending and descending aorta.^[3]

Type I – Originates in ascending aorta, propagates at least to the aortic arch and often beyond it distally.

Type II – Originates in and is confined to the ascending aorta.

Type III – Originates in descending aorta, rarely extends proximally but will extend distally.

Stanford : The *Stanford classification* is divided into 2 groups; A and B depending on whether the ascending aorta is involved.^[4]

A – Involves the ascending aorta and/or aortic arch, and possibly the descending aorta. The tear can originate in the ascending aorta, the aortic arch, or, more rarely, in the descending aorta.^[5] It includes DeBakey type I, II and retrograde type III^[6] (dissection originating in the descending aorta or aortic arch but extending into the ascending aorta).

B – Involves the descending aorta (distal to left subclavian artery origin), without involvement of the ascending aorta or aortic arch.^[5] It includes DeBakey type III without retrograde extension into the ascending aorta.

Sign and symptoms in about 96% of individuals with aortic dissection present with severe pain that had a sudden onset. It may be described as tearing in nature, or stabbing or sharp in character.^[8] 17% of individuals will feel the pain migrate as the dissection extends down the aorta. The location of pain is associated with the location of the dissection. Less common symptoms that may be seen in the setting of aortic dissection include congestive heart failure (7%), syncope (9%), cerebrovascular accident (3-6%), ischemic peripheral neuropathy, paraplegia, cardiac arrest, and sudden death. If the individual had a syncopal episode, about half the time it is due to hemorrhage into the pericardium leading to pericardial tamponade , as seen in our case.

Aortic dissection is associated with hypertension (high blood pressure) and many connective tissue disorders. Vasculitis (inflammation of an artery) is rarely associated with aortic dissection. It can also be the result of chest trauma. 72 to 80% of individuals who present with an aortic dissection have a previous history of hypertension. The highest incidence of aortic dissection is in individuals who are 50 to 70 years old. The incidence is twice as high in males as in females (male-to-female ratio is 2:1). Half of dissections in females before age 40 occur during pregnancy (typically in the 3rd trimester or early postpartum period). A

bicuspid aortic valve (a type of congenital heart disease involving the aortic valve) is found in 7–14% of individuals who have an aortic dissection. Marfan syndrome is noted in 5–9% of individuals who suffer from aortic dissection. Turner syndrome also increases the risk of aortic dissection, by aortic root dilatation.^[9] Chest trauma, cardiac surgery, aortic insufficiency and syphilis are also associated with aortic dissection.

The risk of death is high in untreated aortic dissection. While the risk is very high in the first 24 hours of the event, those that survive the initial event still have an elevated mortality compared to age- and sex-matched controls. 75% of those with ascending aortic dissection who are not treated die within 2 weeks.^[10] With aggressive treatment 30-day survival for thoracic dissections may be as high as 90%.^[10]

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2

AN ABNORMAL UNILATERAL ORIGIN OF DORSALIS PEDIS ARTERY- A CASE REPORT

Authors:- Dr. Hetal Vaishnani, Dr.Subhsh Gujar, Dr.Savita Gadekar, Dr.K.V.Bondre, Dr.G.V.Shah

Department of Anatomy

S.B.K.S.Medical Institute & Research Center

Sumandeep Vidyapeeth

At: - Piparia TA: - Waghodia, Dist: - Vadodara

e-mail:- drhetal24@gmail.com

Dr. Hetal Vaishnani, Dr.Subhsh Gujar, Dr.Savita Gadekar, Dr.K.V.Bondre, Dr.G.V.Shah

S.B.K.S. Medical Institute & Research Center, Sumandeep Vidyapeeth , Piparia, Vadodara, Gujarat.

Abstract: - During routine dissection of cadavers allotted to first MBBS students, we came across certain variation in the origin of dorsalis pedis artery. Normally the dorsalis pedis artery is a continuation of the anterior tibial artery. Here we found that the dorsalis pedis artery was a continuation of the large perforating branch of the peroneal artery on the right side of lower limb. Awareness of the anatomical variation in anatomy of the dorsalis pedis artery is important for angiographers, vascular surgeons and reconstructive surgeons and also helpful for the pulsation of the dorsalis pedis artery.

Key words: - Dorsalis Pedis artery, anterior tibial artery, peroneal artery.

Introduction: - The Dorsalis pedis artery is the major source of blood supply to dorsum of the foot. The dorsalis pedis artery as a continuation of the anterior tibial artery distal to the ankle and passes

forward along the medial side of the dorsum to the gap between the two heads of the first dorsal interosseous muscle. Here the artery enters the sole and forms the plantar arch by joining with the deep branch of lateral plantar artery. The artery may be larger, to compensate for a small lateral plantar artery, or may be replaced by a large perforating branch of the peroneal. It often diverges laterally from its usual route.

The Dorsalis Pedis artery passes beneath the extensor retinaculum, the artery rests successively on the capsule of ankle joint, talus, navicular and intermediate cuneiform bones, the artery above covered by skin, superficial fasciae and is crossed close to its termination by the tendon of extensor hallucis brevis, and lies in between the tendon of extensor hallucis longus and medial terminal branch of deep peroneal nerve, and digital tendon of extensor digitorum longus for the second toe.

The dorsalis pedis artery gives off the tarsal, arcuate and first dorsal metatarsal arteries.

Surface anatomy- The dorsalis pedis pulse is sought by palpation immediately lateral to the tendon of extensor hallucis longus against the underlying tarsal bones.

Material & method: -

This case was observed in Department of Anatomy S.B.K.S. Medical Institute & Research center, Piparia. During the dissection of lower limb of anterior tibial artery an abnormal origin of Dorsalis pedis artery was found. Common variation of Dorsalis Pedis artery is that it may be large, in relation to the long tendon of dorsum of foot. The dissection was carefully done to clean the artery and this abnormal origin of artery was found. The specimen was preserved in the department.

Discussion: -

The Dorsalis pedis artery is a continuation of the anterior tibial artery distal to the ankle anteriorly. Distal to the ankle, the dorsalis pedis artery travels lateral to the extensor hallucis tendon along its course to the great toe⁴. Previous studies have reported the dorsalis pedis pulse impalpable in 3.1% to 13.8% of healthy patients.^{5 6}

Examination of pedal pulse remains a useful clinical tool when evaluating peripheral circulation. Although a correlation between the ability to palpate pulses and the degree of systolic perfusion pressure has been established, controversy surrounds its accuracy¹. Unreliance among investigators stems from discrepancies related to arterial size, amount of subcutaneous fat, edema, or neurovascular diabetic changes^{3 8}.

The Dorsalis Pedis artery is an often overlooked, but important artery that can be utilized for limb salvage surgery. It is especially useful in the diabetic patient in whom disease at the level of the bifurcation of the popliteal artery is common. The unique anatomic location and communication with the pedal arch makes a good outflow vessel¹¹.

The knowledge of the variations of the dorsalis pedis artery is also important in different vascular surgeries and orthopedic surgeries of the foot. A diminished or absent dorsalis pedis pulse usually suggest vascular insufficiency resulting from arterial disease. The five “P” signs of acute arterial occlusion are pain, pallor, paraesthesia, paralysis, and pulselessness. Some healthy adults (and even children) have congenitally non-palpable dorsalis pedis pulse the variation is usually bilateral⁵.

Reconstruction of the arteries of the foot in patients with severe chronic arterial occlusive disease has become a routine and valuable procedure. However, it is frequently difficult to select the optimal site for the distal arterial anastomosis¹².

Anomalies of vessels are incidentally found in the anatomy dissection hall. They cause confusion in interpretation of imaging study, for angiographers, vascular surgeons, who operate upon these regions. It can create confusion in the pulsation of the Dorsalis pedis artery.

Conclusion:- This case is a rare abnormal origin where the dorsalis pedis artery is continuation of the large perforating branch of peroneal artery on the right side and on the left side was normal origin. The peroneal artery reached the anterior compartment by piercing the interosseous membrane at its lower part and ran as the dorsalis pedis artery. Awareness of the anatomical variation in anatomy of the dorsalis pedis artery is important for angiographers, vascular surgeons and reconstructive surgeons and also helpful for the pulsation of the dorsalis pedis artery.

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Fig: 1 peroneal artery is continue as Dorsalis pedis artery on the right side

ATA: - Anterior tibial artery PA: - Peroneal artery DPA: - Dorsalis pedis artery.



Fig: 2 Left side Dorsalis pedis artery originates normally.

3

3

A UNILATERAL VARIANT OF MUSCULOCUTANEOUS NERVE

Authors: Mehra Simmi*, Chowdhary D.S. and Ghulyani Tuhin*****

(*Associate Professor **Professor & head *Resident,
Department of Anatomy, M.G. Medical College, Jaipur)**

ABSTRACT

Variations in the origin, course, branching pattern, termination and connections of the musculocutaneous nerve (MCN) are not uncommon. These variations have clinical significance during surgical procedures, in brachial plexus block and in diagnostic clinical neurophysiology. In the present case, we have reported unilateral variation of musculocutaneous and radial nerves on the right side in a male cadaver. The MCN trifurcated after piercing coracobrachialis and innervated biceps brachii and brachialis muscles and the third branch descended along lateral border of forearm terminating at the proximal phalanx of the right thumb. The superficial branch of radial nerve (RN) was found to be missing. The structures on the left limb were found to be normal. Knowledge of such variations helps in the management of shoulder and arm traumas, nerve grafting and diagnosing peripheral neuropathies.

INTRODUCTION

The musculocutaneous nerve branches out from the lateral cord of brachial plexus. It pierces coracobrachialis muscle(CB) to innervate it and biceps brachii muscle. It then descends inferolaterally between the biceps brachii and brachialis muscles, giving a branch to the latter and continues as the lateral cutaneous nerve of forearm without exhibiting any

communication with any other nerve (Gray's). Variations of MCN and its branches have been reported in the past (Linell 1921, Bergman et al 1988, Chitra 2007. Rao and Choudhary (2001) and Song et al (2003) have reported the absence of MCN

Radial nerve (RN) arises from the posterior cord of brachial plexus. It passes obliquely across the back of humerus supplying the triceps and then it pierces intermuscular septum and enters the anterior compartment of the arm descending between brachialis medially and brachioradialis and extensor carpi radialis longus muscles laterally. On reaching the front of lateral epicondyle, it divides into terminal rami, superficial and deep. The superficial branch of the RN descends along the front of the lateral side of the upper 2/3 of the forearm and then about 7 cm above the wrist passes deep to brachioradialis, winds around the radius and divides into 4-5 digital nerves

Yogesh et al (2011) have reported a case in which MCN has substituted for the course and distribution of RN below the arm. In the present case, we have observed a different kind of variation of the musculocutaneous and radial nerves.

CASE REPORT

The present variation was observed in the right upper limb of male cadaver, during routine dissection in the anatomy department of our college.

The musculocutaneous nerve took origin from the lateral cord of brachial plexus and descended to pierce coracobrachialis muscle. After emerging from coracobrachialis (fig. Arrow-a) the nerve gave a branch to biceps brachii and divided into two. One supplying the brachialis muscle and the other passing between brachialis and biceps brachii descended

along the lateral border of forearm to give multiple cutaneous branches in the lower part of forearm (fig. Arrow–b) and to lateral border of palm before terminating along the lateral border of the proximal part of the thumb. (fig. Arrow–c)

The course of radial nerve was observed to be normal till it pierced supinator. The superficial branch of RN was observed to be missing. The RN continued with the course and distribution as that of its deep branch.



DISCUSSION

In this case report the superficial branch of RN has been replaced by MCN. Review of literature shows reporting of many variations of brachial plexus especially that of MCN and Median nerve (MN). Le Minor (1992) classified the variation of MCN and MN into five types.

Nakatani et al (1997), Le Minor (1992) Gumusburun and Adiguzel (2000), Song et al, Rao & Chaudhary (2001), Jamuna & Amudha have reported either unilateral or bilateral absence of MCN. Chitra (2007) observed 2 cases where MCN did not pierce coracobrachialis muscle.

Joshi et al (2008), Bhattarai (2009), Jamuna and Amudha (2011) have reported cases where MCN fibres join with those of MN after piercing coracobrachialis muscle. Tsikaas et al (1983) have reported origin of MCN from MN unilaterally in a male cadaver.

But there is paucity of literature concerning variations or connections between MCN & RN. Tryfonidis et al (2004) reported the piercing of brachioradials by the superficial branch of radial nerve. Yogesh et al (2011) have reported a case where radial brachioradialis, extensor carpi radialis longus & brevis muscles are supplied by MCN instead of RN. They have reported MCN supplying coracobrachialis, biceps brachii & brachialis muscles and giving off the lateral cutaneous nerve of forearm. MCN in their case bifurcated into a superficial and a deep branch 7 cm distal to medial epicondyle. The course & distribution of these branches were similar to those of RN. Hence, MCN replaced the distal part of radial nerve. However, in our case it trifurcated after piercing CB muscle and continued as that of the course of superficial branch of the radial nerve.

From clinical point of view comprehension of such variations is of great importance during flap dissections, post traumatic evaluations of the arm, nerve grafting and neurophysiological evaluation for diagnosing peripheral neuropathies.

Coracoid process grafting, shoulder dislocations and fragment arthroscopies may damage the MCN as well as muscles in these regions (Flatow et al, 1989).

The existence of the variation described in our case report may be attributed to the altered signaling between mesenchymal cells and neuronal growth cones or circulatory factors at the time of gene controlled site specific fission of brachial plexus cords.

The motor axons arrive at the base of developing limb bud (Moore & Persaud, 2003) in the 5th week of Intra Uterine Life. They mix to form growth cones which form brachial plexus in the upper limb. This advancement of growth cones is regulated by the expression of chemo-attractants and chemo-repulsants in a specific fission. (Larson, 2001). It is

at this point that altered signaling can take place leading to variants in nerve patterns.

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4

MYSTERIOUS CASE OF MISSING DIAGNOSIS ? Tuberculosis

Jasmin Jasani* , Anand Vachhani**, JJJ Falleiro*** Himani patel****, Kaushik Patel*****

* Asst.professor of pathology , SBKS Medical Institute and Research Center

** Resident pathology, SBKS Medical Institute and Research Center

*** Professor of pathology, SBKS Medical Institute and Research Center

**** Resident pathology, SBKS Medical Institute and Research Center

***** Resident pathology, SBKS Medical Institute and Research Center

correspondence author :Dr.Jasmin jasani

E-Mail :- drjasmin27@gmail.com

Key words. Progressive deep vein thrombosis. Empirical anti tuberculous therapy

INTRODUCTION

In today's mileu of modern medicine it is rare for a patient to present acutely, progress rapidly, investigate negatively and respond to empirical treatment. Such a case of deep vein thrombosis with polyserositis in a young adult female is presented. All investigations were negative. She responded to empirical anti tuberculous therapy and departed happily leaving treating doctors none the wiser.

CASE REPORT

A 33 years old female reported with complaints of dry cough, fever not associated with chills and rigor and on and off for 4 days of duration. She had been admitted to another hospital a month earlier with pain and of swelling of right lower limb below knee. An intravenous cannula had been inserted in the right brachial vein for administration of antibiotics and fluids. She developed thrombophlebitis right upper limb at the site of intravenous cannula insertion. Doppler study showed thrombosis of right cephalic vein. She had also developed altered sensorium and sluggish speech for which a MRI of the brain was done and was normal. She had also developed sudden breathlessness for which a CT scan Chest was done which showed no abnormality, D Dimer was 6000 ng/ml. She had been married for nine years with no issue and for the last two years was on Ayurvedic medication (composition not known) for infertility.

On examination the patient had a temperature of 101* F, pulse 125/min, Blood pressure 126/80 mm Hg, examination of chest showed decreased air entry over left infrascapular region. There were multiple superficial ulcers with crust formation over the dorsum of the left hand.

Investigations done at this institute were as follows Hemoglobin 7.9 g/dl, Total leukocyte count 5,900 /cu mm, Differential count – Neutrophils 74 %, lymphocytes 23 %, eosinophils 1% and monocytes 2 %. Platelets were 4,39000 /cu mm, ESR was 134 mm in 1st hour Westergrens. All biochemical parameters were normal. X Ray Chest showed bilateral pleural effusion left more than right. Echocardiography showed pericardial effusion with septation. Ultrasound of abdomen showed minimal ascites.

The pleural fluid had 4.1 g/dl protein, 96mg /dl sugar, 30 IU/L Adenosine deaminase and 256 IU/L lactate dehydrogenase. Pleural fluid showed a mesothelial reaction with acute inflammatory cells. Gram and Ziehl Nielsen stain Culture grew acinetobacter.

She was diagnosed as polyserositis with thrombophlebitis with sepsis and put on broad spectrum antibiotics, oral anticoagulants and low molecular weight heparin. She was further investigated for autoimmune disease, coagulation

disorder and tuberculosis. The patient continued to be febrile with temperature up to 102* F with tachycardia.

PCR for Mycobacterium tuberculosis was negative. Anticardiolipin antibody IgG and IgM were not detected. Anti nuclear antibodies were not detected. Her thyroid function tests were normal and screen for monoclonal gamopathy serum electrophoresis and urine for Bence Jones proteins were negative.

Lupus anticoagulant screen was prolonged 76 sec against a normal of less than 45 seconds. HIV, HBsAg and HCV serology was negative

A pericardiectomy was done. The surgeon noted cheesy material. The biopsy was reported as chronic nonspecific inflammation and methyl violet stain for amyloid was positive

Anti tuberculous therapy was added to the medication. The patient became afebrile after a week and improved clinically. She was discharged after a total stay of three weeks in this hospital.

Method :- A case report of deep vein thrombosis is documented in a young non gravid female at Dhiraj general hospital under SBKS Medical college, Pipria. All relevant investigations were negative.

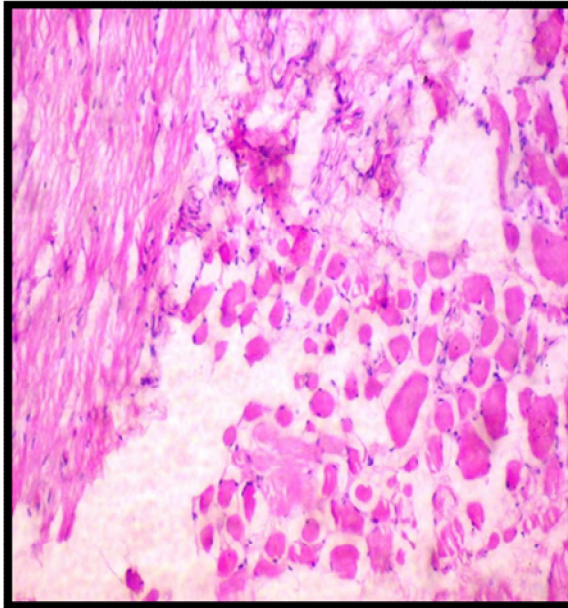
DISCUSSION:

A young female married for nine years with no issue developed polyserositis and deep vein thrombosis. Keeping in mind the clinical profile the following possibilities were entertained: Auto immune disease, primary clotting factor defect, Tuberculosis and occult malignancy. All Tests were negative. The only lead was the description of 'Cheesy material' on pericardial biopsy and skin lesion.

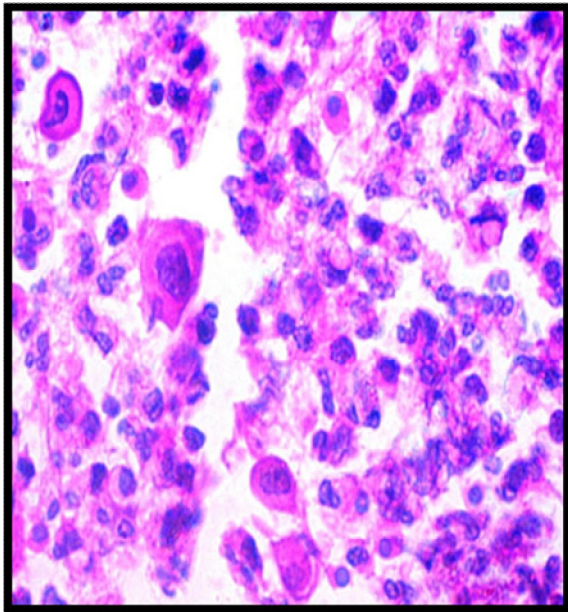
Based on strong clinical suspicion 'Cheesy material' on pericardial biopsy and skin lesion investigations anti tubercular therapy was started to which the patient responded dramatically . She is presently hale and hearty.

Result :- This report highlights the fact that medical practice in the private sector is directed by

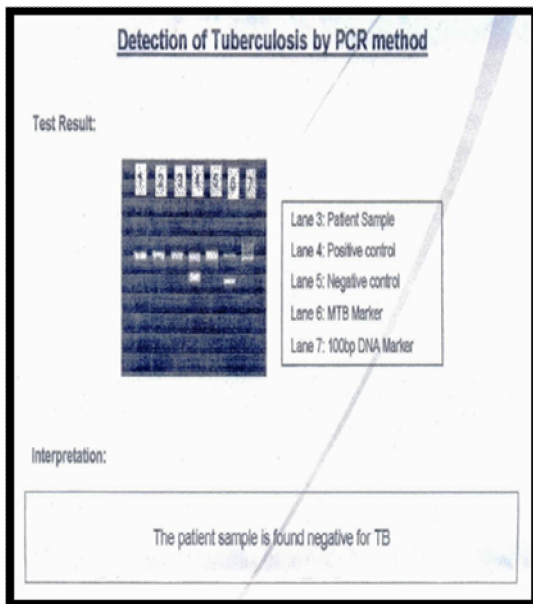
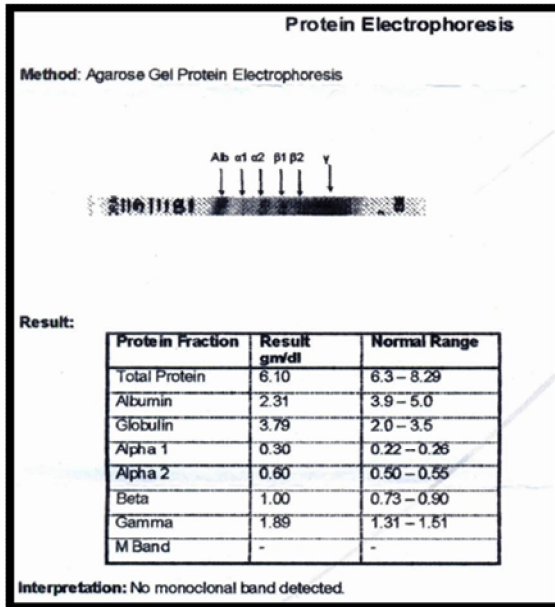
- a) The paying capacity of the patient.
- b) The willingness of the patient to submit to investigation and treatment.
- c) The interest of the physician to actively follow up the patient.
- d) Even when all the above are complied with the results are not explainable.



**H & E stain : Pericardial Biopsy-
Chronic nonspecific inflammation**



**Pleural fluid :- acute inflammatory
cell reaction**



Protein Electrophoresis

PCR for Tuberculosis

5

LAPAROSCOPIC SCAR ENDOMETRIOISIS – LAPAROSCOPIC TUBAL LIGATION: A RARE CASE REPORT

Authors :Dr R.K Tandon , Dr Dimple Darad,Dr Ashima Chugh . Dr Kaushik Bhuva

Sumandeep vidhyapith university
Deptt of pathology
SBKS MI & RC Pipariya Dist .Vadodara

Abstract

Endometrium located outside its normal location is called endometriosis. Scar endometriosis (IE) is a rare entity reported in 0.03-1.08% of women following obstetric or gynecological surgeries. Post salpingectomy endometriosis is documented in 20 – 50 % of tubes examined after ligation. The diagnosis is frequently made only after excision and histopathology of the lesion. We are presenting a case of 42 years old woman undergone laparoscopic tubal ligation four years back complained of cyclic pain during menstruation. On examination, there was a firm nodule measuring 3x4cm in size at laparoscopic tubal ligation site that became spontaneously painful during menstrual bleeding. The USG report suggested Desmoid tumor. The nodule was excised & sent for Histopathological examination which confirmed the diagnosis.

Key Words

- Scar endometriosis, laparoscopic tubal ligation, Post salpingectomy endometriosis

Key Messages

1. Post salpingectomy endometriosis is documented in 20 – 50 % of tubes examined after ligation.
2. Laparoscopic tubal ligation , although thought to be the safest procedure but cases of endometriosis are documented in these patients

Introduction

Endometriosis was first described by Rokitansky in 1860. It is defined as the presence of functioning endometrium outside the uterus. It occurs in 8-15% of women of reproductive age group. Post-salpingectomy endometriosis is usually noted at the tip of the proximal stump, 1-4 years after tubal ligation. It constitutes around 20-50% of cases examined after tubal ligation. The chances of this being detected are higher especially if electrocautery is used in tubectomy, if the proximal stump is short and if the post-ligation interval is long. It usually

produces firm, palpable nodules which must be evaluated and differentiated from other benign and malignant abdominal wall tumors. The most common locations of abdominal wall endometriomas are old surgical scars from obstetric or gynecological procedures. Scar endometriosis presents clinically as a painful, palpable subcutaneous mass, associated with cramps and bloating during menses. It is easily confused with other conditions, such as Desmoid tumor, Keloids, Hematoma, Stitch granuloma, Abscess, inguinal and incisional hernia. For confirmation of the diagnosis histopathological examination is done. Treatment of endometriosis is medical (contraceptive pills, Danazol) or surgical (Laparoscopy and Laser surgical resection).

CASE REPORT

A lady of 42 years came to surgery OPD and complained of cyclic pain during menstruation.. On examination, there was a firm soft mobile nodule measuring 3x4cm in size at laparoscopic tubal ligation site. She complained that the nodule became spontaneously painful during menstrual bleeding. The USG report suggested of a desmoid tumor. The surgeons excised that nodule and sent for Histopathological examination. A skin covered soft tissue mass was received measuring 8x6x4cms. The outer surface was smooth.

Histopathology report

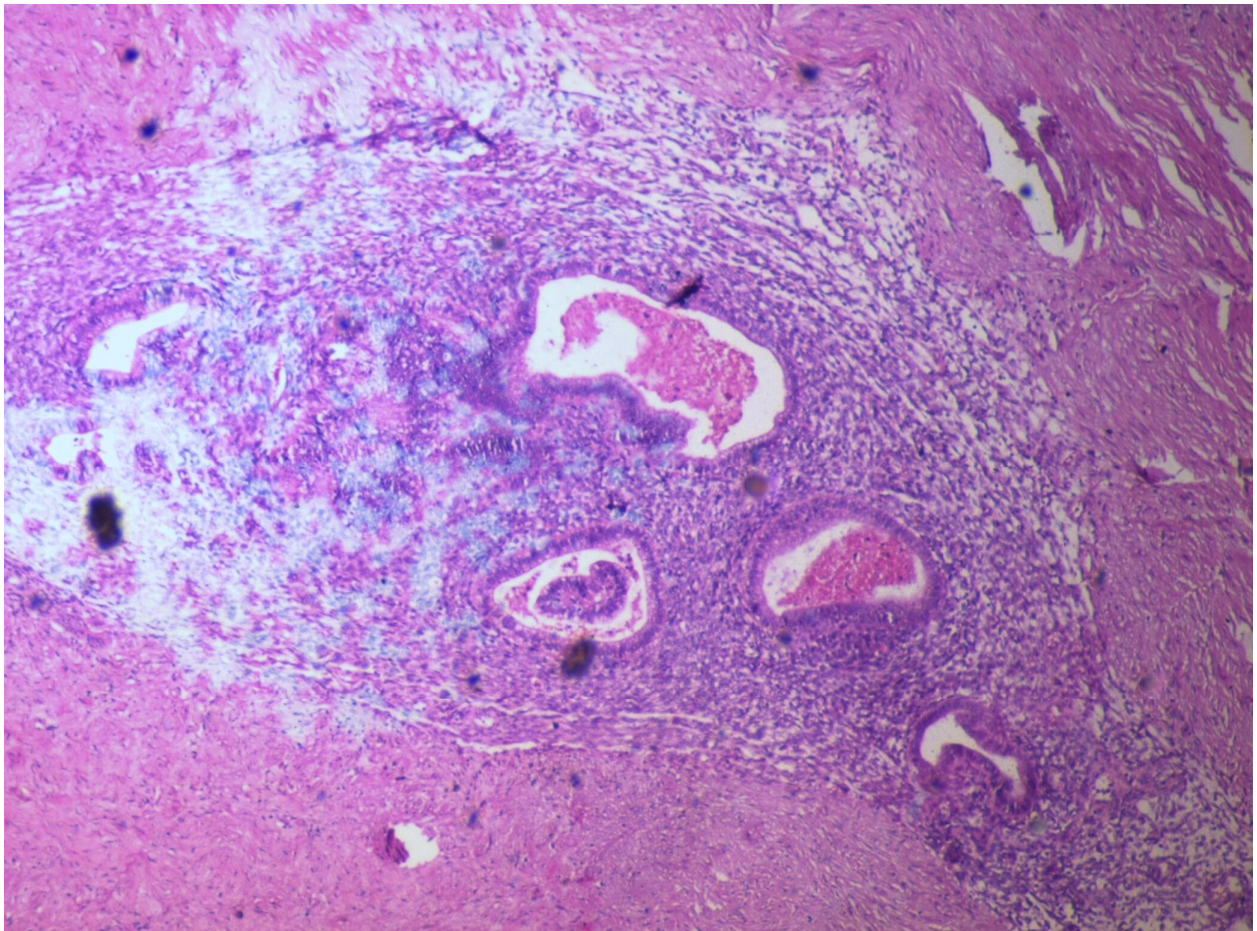
The histopathology report showed histomorphology of skin & fibrous tissue with underlying presence of endometriosis showing distended endometrial glands, endometrial stroma & areas of hemorrhage. Hemosiderin pigment laden macrophages & few chronic inflammatory cells were also seen..

Discussion

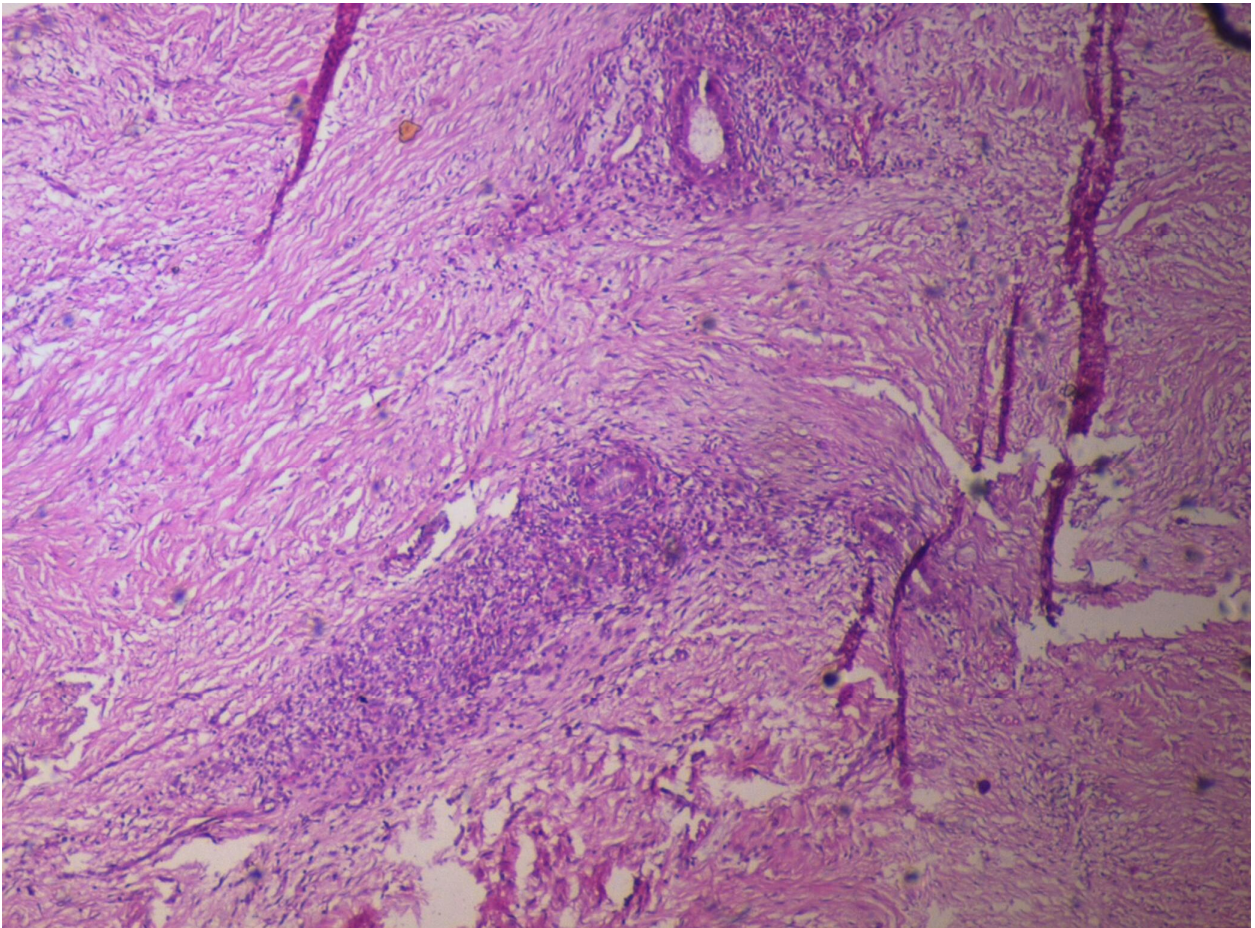
Scar endometriosis most commonly occurs after operation on the uterus and tubes. The gynecological operative procedures like laprotomy/caesarian sections/episiotomy carry the risk of triggering the appearance of endometrial tissue in operative scar tissue. The etiology of abdominal wall endometriosis is thought to be a result of transportation of endometrial tissue during surgical procedures and subsequently stimulated by estrogen to produce endometriomas. Review of the surgical literature indicates that preoperative diagnosis is often incorrect^{1,2}. Sampson had claimed that after partial salpingectomy for sterilization, the tubal epithelium sprouted from the cut ends and invaded the surrounding tissues. This misplaced tubal epithelium retained its original structure (endosalpingiosis) or underwent metaplasia (endometriosis).^{3,4,5}. This concept of post-salpingectomy endosalpingiosis or endometriosis has been challenged by Stock. He concluded that endosalpingeal endometriosis of the proximal stump was due to repeated menstrual reflux rather than metaplasia of seeded or invading tubal mucosa.^{6,7}.

Rock JA et al studied details gross and histological findings of 79 previously ligated fallopian tubes from 3 groups of patients. Of 20 tubes removed after documented sterilization failure , 6 showed endometriosis. 4 of 9 previously ligated tubes, were injected with ink; 2 patients showed ink in epithelium-lined spaces beyond the muscle of the tubal wall from the tubal lumen to the serosal surface. Laparoscopic cautery sterilizations had higher percentages of fistula formation and endometriosis at sterilization site than sterilizations by other methods. Therefore, ligation of the fallopian tube within 4 cm of the uterine cornu may predispose development of endometriosis and subsequent fistula formation at the tip of the ligated tube. :

To conclude one should be suspicious of scar endometriosis when woman present with painful swelling in the abdominal scar & giving history of previous gynecological or obstetrical surgery. Since the fallopian tube is not sampled extensively during routine processing of hysterectomy specimens, there are chances of missing the variations in the morphology of the fallopian tube and hence under-reported. Therefore, the pathologists should be aware of such morphological aberrations in the fallopian tube.



The section shows histomorphology of distended endometrial glands, endometrial stroma & fibrous tissue.(H & E , 10X)



The section shows histomorphology of endometrial glands, endometrial stroma . Hemosiderin pigment laden macrophages & few chronic inflammatory cells are also seen.
(H & E , 10 X)

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6

EXTRA OCULAR SEBACEOUS CARCINOMA OF THE STERNUM IN BIOPSY :A CASE REPORT.

DR. R.K.Tandon **Professor of Pathology**
DR. Jasmin Jasani **Assistant Professor of Pathology**
DR. Jigar Patel **Resident (2ndyr) Pathology**
DR. Arti Patel **Resident (2ndyr) Pathology**

Department(s) and institution(s)

DEPARTMENT OF PATHOLOGY,
S.B.K.S. MEDICAL INSTITUTE & RESEARCH CENTRE,
SUMANDEEP VIDYAPEETH PIPARIYA,
Tal: WAGHODIA, VADODARA CITY, GUJARAT STATE

TITTLE OF THE ARTICLE:

A CASE REPORT OF EXTRA OCULAR SEBACEOUS CARCINOMA OF THE STERNUM IN BIOPSY.

CONTRIBUTORS:

1. DR. R.K.Tandon **Professor of Pathology**
2. DR. Jasmin Jasani **Assistant Professor of Pathology**
3. DR. Jigar Patel **Resident (2ndyr) Pathology**
4. DR. Arti Patel **Resident (2ndyr) Pathology**

E-mail (for correspondence): drjigurpatel@yahoo.com

ABSTRACT

Sebaceous carcinoma is a rare aggressive malignant tumor derived from adnexal epithelium of sebaceous glands. It is most commonly seen in the orbital region. Amongst extra ocular sites, like head and neck, vulva, penis, thigh but sebaceous carcinoma in the sternum is very rare in our literature. 19 year old young male came in Dhiraj general hospital presented with painful, fungating growth over sternum since 6 month. Surgen sent biopsy for histopathology and we gave sebaceous cell carcinoma in histopathology report.

Key words: Extra ocular sebaceous cell carcinoma, histopathology.

INTRODUCTION:

Sebaceous carcinoma account for < 1% of all cutaneous malignancy. It is a rare aggressive malignant tumor derived from the adnexal epithelium of the sebaceous glands⁽¹⁾. Ocular sebaceous carcinoma account for only 0.2 to 0.7 % of all eyelid tumor⁽²⁾. Despite wide spread anatomic distribution of sebaceous glands, extra ocular sebaceous carcinoma is very rare comprising only 25% of all reported cases of sebaceous carcinoma⁽⁵⁾. So far only few cases of extra ocular sebaceous carcinoma are reported in the literature⁽⁵⁾ and none in the sternum so far.

CASE REPORT

A 19 year young male presented with swelling over sternum since 4-5 year. It was gradually increasing in size in last 6 months. The rest of the physical examination was normal. Particularly there was no lymph node metastasis. Surgen noted a growth over sternum which is 6x6x3 cms painful and fungating . It was firm in consistency with well defined margin, fixed to underlying structure with foul smelling, watery discharge present. A biopsy was taken from the growth and sent for histopathology examinations.

Gross examination: We received yellowish white soft tissue bits aggregating 2x1x0.5 cms.

Microscopic examination: It showed of stratified squamous lining epithelium with underlying tissue showing pleomorphic, multivacuolated, highly atypical epithelial cells arranged in rounded nests in the dermis. Nucleus and nucleoli showed high grade pleomorphism, hyperchromatism, atypical mitotic figures with moderate to abundant cytoplasm with multi vacuolation. Similar tumor cell were also seen invading epidermis suggestive of pagetoid involvement. Areas of necrosis, acute on chronic inflammation and hemorrhage were also seen. Over all feature were that of sebaceous carcinoma with pagetoid involvement of skin.

REVIEW OF LITERATURE AND DISCUSSION

Sebaceous Cell Carcinoma accounts for less than 1 percent of all cutaneous malignancies, is a rare, but aggressive, malignant neoplasm that originates from

sebaceous glands. It is more common in ocular adnexa, particularly in Asian countries ⁽¹⁾. Sebaceous Cell Carcinoma is a potential marker of Torre-Muir syndrome (MTS), alerting to search for an occult internal malignancy, most commonly colorectal carcinoma ⁽⁴⁾. The MTS is defined by the combination of a sebaceous gland tumor and at least one visceral carcinoma occurring in the same individual in the absence of other precipitating factors. Skin lesions may precede the presentation of internal malignancies, but often develop later. In our case, there is no internal malignancy and it is considered to be an isolated lesion. Extra ocular sebaceous carcinoma is rare, which constitutes 25% of all cases of sebaceous carcinoma⁽⁵⁾. Most extra ocular Sebaceous Cell Carcinoma (75%) are encountered in the skin of the head and neck⁽⁵⁾, followed by the trunk, salivary glands, genitals, and extremities ^(2,5).

In our case, the tumor affected the sternum. It usually arises in adults, with an average patient age of 60 years and a slight male predominance⁽⁵⁾. Clinically, extra ocular sebaceous carcinoma present as erythematous nodule that can sometimes ulcerate. In extraocular sites, sebaceous malignancies are commonly confused with basal cell carcinomas and squamous cell carcinomas with an exophytic/ulcerative lesion ^(2,3), like our case. Histological examination revealed proliferation of atypical enlarged basaloid cells with focal mature sebaceous differentiation. Cytological atypia and infiltrative border was noted. In contrast to peri ocular carcinoma, pagetoid intra-epithelial migration is uncommon ⁽⁵⁾.

Sebaceous Cell Carcinoma has more difficulties of diagnosis because it has diverse histologic patterns. It can be confused with other cutaneous tumors. Sebaceous Cell Carcinoma must be distinguished from basal cell carcinoma, amelanotic melanoma, squamous cell carcinoma and rarely metastatic clear cell carcinoma of the kidney by histochemical and immunohistochemical methods. Tumor cells in sebaceous carcinoma are positive for cytokeratin, epithelial membrane antigen, CEA and S100 are absent ⁽⁶⁾. Clear cell squamous cell carcinoma usually shows evidence of keratinisation in the form of dyskeratotic cells and squamous parakeratotic whorls.

Wide excision and selective use of radiotherapy remain the treatment of choice ^(2,7). Sebaceous carcinoma can exhibit aggressive local behaviour and metastasize to regional lymph nodes and distant organs ^(1,3). Feature indicative of a poor prognosis are vascular invasion, involvement of both eyelid, poor differentiations, multicentric origin, large size, a highly infiltrative pattern and pagetoid spread. It has been suggested that extra ocular Sebaceous Cell Carcinoma can widely metastasizes and cause death just as frequent as ocular types.

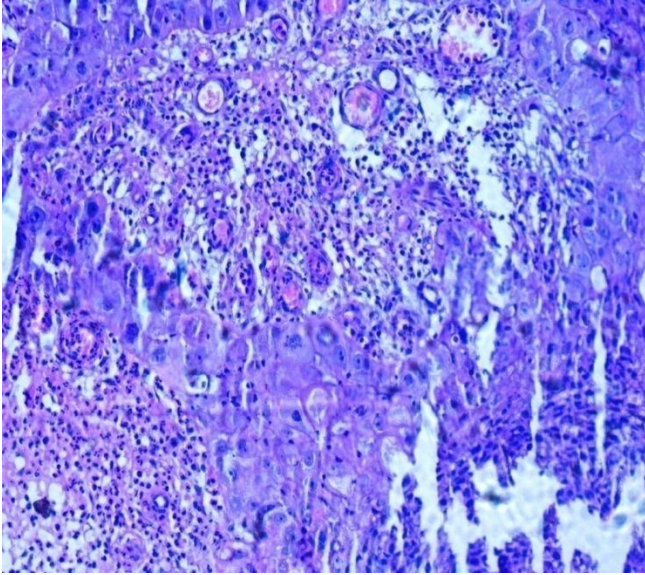
In summary, Sebaceous Cell Carcinoma is a rare and aggressive malignancy. This tumor should suggest the possibility of MTS and alert to search an occult internal malignancy.

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11

Microscopic pictures



Dr Fig.1 Low power microscopy show pleomorphic, multivacuolated, highly atypical epithelial cells arranged in rounded nests in the dermis with chronic inflammation. (4x Haematoxylin&Eosin)

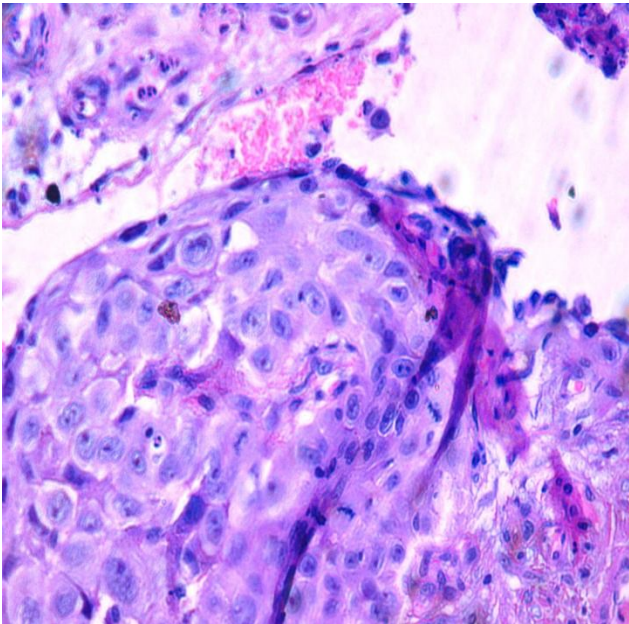


Fig.2 High power microscopy show Nucleus and nucleoli showed high grade pleomorphism, hyperchromatism, atypical mitotic figures with moderate to abundant cytoplasm with multi vacuolation. (20x Haematoxylin&Eosin)

NOBEL PRIZE 2011 IN PHYSIOLOGY OR MEDICINE.

Year **2011** Nobel Laureates have revolutionized our understanding of the immune system by discovering key principles for its activation by

- 1] Bruce A. Beutler and Jules A. Hoffmann for their discoveries concerning the activation of innate immunity and the other half to
- 2] Ralph M. Steinman for his discovery of the dendritic cell and its role in adaptive immunity

The Nobel Assembly, consisting of 50 professors at Karolinska Institutet, awards the Nobel Prize in Physiology or Medicine. Its Nobel Committee evaluates the nominations. Since 1901 the Nobel Prize has been awarded to scientists who have made the most important discoveries for the benefit of mankind

Scientists have long been searching for the gatekeepers of the immune response by which man and other animals defend themselves against attack by bacteria and other microorganisms. Bruce Beutler and Jules Hoffmann discovered receptor proteins that can recognize such microorganisms and activate innate immunity, the first step in the body's immune response. Ralph Steinman discovered the dendritic cells of the immune system and their unique capacity to activate and regulate adaptive immunity, the later stage of the immune response during which microorganisms are cleared from the body. The discoveries of these Nobel Laureates have revealed how the innate and adaptive phases of the immune response are activated and thereby provided novel insights into disease mechanisms. Their work has opened up new avenues for the development of prevention and therapy against infections, cancer, and inflammatory diseases.

We live in a dangerous world. Pathogenic microorganisms (bacteria, virus, fungi, and parasites) threaten us continuously but we are equipped with powerful defense mechanisms. The first line of defense, innate immunity, can destroy invading microorganisms and trigger inflammation that contributes to blocking their assault. If microorganisms break through this defense line, adaptive immunity is called into action.

With its T and B cells, it produces antibodies and killer cells that destroy infected cells. After successfully combating the infectious assault, our adaptive immune system maintains an immunologic memory that allows a more rapid and

powerful mobilization of defense forces next time the same microorganism attacks. These two defense lines of the immune system provide good protection against infections but they also pose a risk. If the activation threshold is too low, or if endogenous molecules can activate the system, inflammatory disease may follow. The components of the immune system have been identified step by step during the 20th century. We know, for instance, how antibodies are constructed and how T cells recognize foreign substances. However, until the work of Beutler, Hoffmann and Steinman, the mechanisms triggering the activation of innate immunity and mediating the communication between innate and adaptive immunity remained enigmatic.

Discovering the sensors of innate immunity Jules Hoffmann made his pioneering discovery in 1996, when he and his co-workers investigated how fruit flies combat infections. They had access to flies with mutations in several different genes including Toll, a gene previously found to be involved in embryonal development by Christiane Nüsslein-Volhard (Nobel Prize 1995). When Hoffmann infected his fruit flies with bacteria or fungi, he discovered that Toll mutants died because they could not mount an effective defense. He was also able to conclude that the product of the Toll gene was involved in sensing pathogenic microorganisms and Toll activation was needed for successful defense against them.

Bruce Beutler was searching for a receptor that could bind the bacterial product, lipopolysaccharide (LPS), which can cause septic shock, a life threatening condition that involves overstimulation of the immune system. In 1998, Beutler and his colleagues discovered that mice resistant to LPS had a mutation in a gene that was quite similar to the Toll gene of the fruit fly. This Toll-like receptor (TLR) turned out to be the elusive LPS receptor. When it binds LPS, signals are activated that cause inflammation and, when LPS doses are excessive, septic shock. These findings showed that mammals and fruit flies use similar molecules to activate innate immunity when encountering pathogenic microorganisms. The sensors of innate immunity had finally been discovered. The discoveries of Hoffmann and Beutler triggered an explosion of research in innate immunity. Around a dozen different TLRs have now been identified in humans and mice. Each one of them recognizes certain types of molecules common in microorganisms. Individuals with certain mutations in these receptors carry an increased risk of infections while other genetic variants of TLR are associated with an increased risk for chronic inflammatory diseases.

A new cell type that controls adaptive immunity Ralph Steinman discovered, in 1973, a new cell type that he called the dendritic cell. He speculated that it could be important in the immune system and went on to test whether dendritic cells could activate T cells, a cell type that has a key role in adaptive immunity and develops an immunologic memory against many different substances. In cell culture experiments, he showed that the presence of dendritic cells resulted in vivid responses of T cells to such substances. These findings were initially met with skepticism but subsequent work by Steinman demonstrated that dendritic cells have a unique capacity to activate T cells.

Further studies by Steinman and other scientists went on to address the question of how the adaptive immune system decides whether or not it should be activated when encountering various substances. Signals arising from the innate immune response and sensed by dendritic cells were shown to control T cell activation. This makes it possible for the immune system to react towards pathogenic microorganisms while avoiding an attack on the body's own endogenous molecules. From fundamental research to medical use, the discoveries that are awarded the 2011 Nobel Prize have provided novel insights into the activation and regulation of our immune system. They have made possible the development of new methods for preventing and treating disease, for instance with improved vaccines against infections and in attempts to stimulate the immune system to attack tumors. These discoveries also help us understand why the immune system can attack our own tissues, thus providing clues for novel treatment of inflammation.

Bruce A. Beutler was born in 1957 in Chicago, USA. He received his MD from the University of Chicago in 1981 and has worked as a scientist at Rockefeller University in New York, at UT Southwestern Medical Center in Dallas, where he discovered the LPS receptor, and the Scripps Research Institute in La Jolla, CA. Very recently, he rejoined the University of Texas Southwestern Medical Center in Dallas as professor in its Center for the Genetics of Host Defense.

Jules A. Hoffmann was born in Echternach, Luxembourg in 1941. He studied at the University of Strasbourg in France, where he obtained his PhD in 1969. After postdoctoral training at the University of Marburg, Germany, he returned to Strasbourg, where he headed a research laboratory from 1974 to 2009. He has also served as director of the Institute for Molecular Cell Biology in Strasbourg and during 2007-2008 as President of the French National Academy of Sciences.

Ralph M. Steinman was born in 1943 in Montreal, Canada, where he studied biology and chemistry at McGill University. After studying medicine at Harvard Medical School in Boston, MA, USA, he received his MD in 1968. He was affiliated with Rockefeller University in New York since 1970, where he was professor of immunology from 1988.

Sadly, Ralph Steinman passed away before the news of his Nobel Prize reached him.

WHO: MESSAGE ON WORLD HEALTH DAY 7 April 2012

Dr Samlee Plianbangchang
Regional Director
SEAR WHO New Delhi

Ageing is a natural and inevitable process. For the past century and more mankind has been adding years to life. More people now survive the challenges of childbirth and live longer through adulthood to reach old age. This trend is not restricted to the resource-rich countries but has become a

global phenomenon including the countries of South-East Asia. It has been estimated that over 8% of the population living in Member States of the World Health Organization's South-East Asia Region are above the age of 60 years. This proportion is expected to increase to 12% by 2025, and to over 20% by 2050. The journey into the uncharted realms of old age is an adventure of continual learning, adjustments and most important of all, mentoring what is good and admirable. This journey begins even before a person is born, right from the mother's womb. The nourishment and care that the mother and her unborn baby receive will determine how the newborn will fare in the world. An encouraging physical, social and mental environment that ensures the well-being and growth of the infant will lead to healthy adolescence, adulthood and eventually, old age. As such, a continuum of care and support including health, that follows a life course will ensure that ageing remains a healthy and fruitful experience and a journey of self transformation, education and contribution.

An ageing population gives rise to several critical queries: impact of an ageing population on the national economy and its social support and health care systems; ways of ensuring the independence, quality of life and activity of the elderly population; and retaining balance between the family, community and the state in caring for an elderly population needing assistance.

Many issues of an ageing population can be overcome, delayed or prevented if the countries adopt policies and implement programmes that promote active and healthy ageing. Promoting and living a healthy lifestyle across the life course means that the elderly population will continue to participate in social, economic, cultural, spiritual and civic affairs in addition to being physically active and economically independent.

Creating age-friendly environments and policies to engage the elderly population and utilizing their vast potential will result in dignified ageing, allowing the elderly population to participate actively in family, community and political life, irrespective of their functional ability. The World Health Organization has embarked on promoting healthy ageing in its Member States with a multipronged approach in SouthEast Asia. Sensitizing and generating awareness among Member States about healthy ageing requires a significant paradigm shift in the way care is provided to the elderly population; a strategic framework to assist Member States to develop plans and strategies for promoting active and healthy ageing among the Region's populations; and timely and appropriate HEALTH in South-East Asia || March 2012 | 3 assistance to build and develop technical capacities in elderly health care. A holistic approach towards establishing healthy ageing in WHO Member States in South-East Asia will require interactions with several other sectors beyond health and WHO is mindful of this need. The large number of projects and activities witnessed in Member States in recent years has given us confidence that healthy ageing can become a part of life and society in the Member States over a short period of time. An age-friendly primary health care will minimize the consequences of noncommunicable or chronic diseases

through early detection, prevention and quality care, and provide longterm palliative care for those with advanced disease. Such interventions would need to be supplemented by affordable long-term care for those who can no longer retain their independence. WHO has been supporting initial projects involving family health practitioners and primary health care providers who are looking at elderly health care in alignment with the relevant psychosocial and economic dependencies. Development and progress have brought about improved quality of life. A key outcome has been longer life-expectancies among the Region's populations. Longer life is associated with chronic diseases and disabilities in old age, not only affecting the overall quality of life but also as an emergent challenge for the family, the community and the national government. Traditional values and practices still occupy a key position where long-term care of the very old is concerned. However, the changing patterns of society where nuclear rather than the joint family is now becoming the norm and economic transitions where large rural-to-urban migration is taking place leaving the old and the infirm at home, are some of the issues affecting the age-old balance of care of the very old persons at home. WHO is concerned about this ever-increasing need for ensuring appropriate long-term care for very old persons, and it continues to interact with Member States on this subject. There is a need for a regional database on community and institutional facilities providing care for the aged populations and national legislation and laws to support and promote healthy ageing. These are issues that WHO has been emphasizing to its Member States. Research on the socio-epidemiological dimensions of healthy ageing; physiological and clinical issues related to ageing; and the technical competencies of national staff in geriatrics and gerontological issues, also requires urgent attention of Member States. Building an age-friendly society requires action by a variety of sectors other than health and includes education, employment, labour, finance, social security, transportation, justice, housing and rural-urban development. All these sectors touch upon the scope of public health and the World Health Organization strives to work with these partners to develop policies and action that promote the health and health care of the elderly.

THE SECRETARY-GENERAL:

“Good health adds life to years”

Each year on 7 April, we observe World Health Day to mark the anniversary of the founding of the World Health Organization in 1948. This year's theme, “Good health adds life to years”, conveys an important message: promoting good health throughout life improves one's chances of remaining healthy and productive in one's later years.

In the middle of the last century, there were just 14 million people in the world

aged 80 years or older. By 2050, there will be almost 400 million people in this age group, 100 million of them in China alone. Soon, for the first time in history, the world will have more adults aged 65 or older than children under five.

This enormous shift in the age of the world's population is closely linked to economic and social development. Thanks primarily to global public health successes in improving childhood survival and adult health, people are living longer in most parts of the world. Many high-income countries are already facing rapidly ageing populations.

In the coming decades, low- and middle-income countries will see equally dramatic increases. Increased longevity is a cause for celebration and something to which we all aspire. Older people make many valuable contributions to society—as family members, as active participants in the workforce, and as volunteers within communities. The wisdom they have gained throughout their lives makes them a unique resource for society.

But more older people also means an increased demand on health care and social security systems. The greatest health threat for older people in all countries is now overwhelmingly from non-communicable diseases. Heart disease and stroke are the biggest killers, and visual impairment and dementia the biggest causes of disability. In

low-income countries, the incidence of these diseases among older people is two to three times greater than in high-income countries. This burden is carried not just by older people, but by their families and by society as a whole.

Many low- and middle-income countries have neither the infrastructure nor the resources to deal with existing needs, let alone to cope with the much greater demands expected in the future. The good news is that there are many practical and affordable solutions that governments can put in place to help their older citizens to lead healthy and active lives. In addition, countries that invest in healthy ageing can expect a significant social and economic return for the whole

On this World Health Day, I urge governments, civil society and the private sector to commit attention and resources to ensuring that people everywhere have the chance to grow older in good health.

Ref: WHO Website