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(1) EDITORIAL:

GUEST ARTICLE

BIOMEDICAL INFORMATICS

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Extensive literature review is essential part of initiating any research work or writing a research article. It not only ensures that you are not “reinventing the wheel” but also provides groundwork for your research especially the justification as well as the methods and framework for your work. It gives credit to those who have drawn baselines in the subject domain on which your proposed research or work is seeking to make further contribution. To do literature review, you need to search for it in a systematic manner and ensure not to miss any study which may be directly relevant to your own work.

Gone are the days when researchers use to hunt for relevant literature in Libraries, going through heap of relevant journals and noting down relevant references on Cards. Indexing and Abstracting products are the default starting points for literature search these days. These products are available in form of bibliographic databases and are compiled carefully

from selected good quality journals. Each citable item published in selected journals is transcribed into a Reference along with Standardized Keywords. These databases if searched in systematic manner ensure most of the worth and relevant references are retrieved.

PubMed, produced by world's largest medical library i.e. US National Library of Medicine, is the most comprehensive international bibliographic database available online for free over Internet URL http://www.ncbi.nlm.nih.gov/pubmed/ (or simply type http://pubmed.gov) . It comprises of more than 23 million citations for biomedical literature from MEDLINE, life science journals, and online books. Citations may include links to full-text content from PubMed Central and publisher web sites. MEDLINE is the primary component of PubMed that contains over 19 million references to journal articles. Bibliographic Records are indexed with NLM Medical Subject Headings (i.e. MeSH®).

To search PubMed, type a word or phrase into the query box. Multiple search terms can be combined with Boolean operators or connector words: "AND," "OR," or "NOT" using upper case letters. PubMed displays a list of Results in Summary format after clicking on the Search button. To retrieve more information about the citation(s), use the Display Settings menu to change the format, how the results are sorted and how many citations are displayed. Filters are available in the left navigation bar and may be used to limit searches.

1. IndMED and MedIND

IndMED:

Researchers normally start with searching internal indexing services like PubMed. Although it is the best known tool for conducting literature survey for medical research, researchers often supplement their search results with similar regional and national databases. IndMED aims to supplement the literature surveys with Indian references. Moreover, it would be of immense use for researchers on diseases and medical problems more prevalent in India than in other developed countries.

IndMED started indexing journals from 1985 onwards. Journals are selected for indexing after a comprehensive review a selection committee from time to time. Selected journals are also reviewed periodically. Presently it indexes about 120 journals and has about 75 Thousand records.

Simple searching can be done straight way from http://indmed.nic.in/ or from IndMED page http://indmed.nic.in/indmed.html by typing keywords combined by Boolean operators i.e AND / OR / NOT. IndMED also provides advance searching where the terms can be restricted to various part of the record say Title etc. Citations from a particular journal can be retrieved from a another separate interface providing a Drop-Down Menu of Journals indexed in IndMED.

MedIND:

The purpose of MedIND is to provide access full text of Indian Medical Journals indexed in PubMed or IndMED. User get easy access to Full Text of Indian Medical Journals, which otherwise are not available through established book trade channels especially outside India. On the other hand, it provide online exposure to those indexed Indian medical journals willing to provide free full text access to there articles. It has been shown time and again that better online exposure leads to better appreciation and citations to articles. MedIND, available freely from URL http://medind.nic.in, hosts 65 Indian Medical Journals which can be browsed through Journal List. Full Text can be downloaded from Available Issues section of each Journal.

2. Internet: Biomedical Information Resources

Health is the most sought after top on Internet. However, in this talk we would be focusing on Internet Information Resources which might of use for Clinicians or Health Care Providers, Medical Researchers and Medical Librarians. Resources like PubMED Health, Advance Google, Cochrane, MDConsult, Medscape, Uptodate, RxList, CIMS etc would be useful for Health Care Professionals. For Medical Researchers, Bibliographical Resources like PubMed and IndMED would be useful. For medical Librarians various resources like Martindale's Health Science Guide would be useful. The talk would conclude on caution with resources available on Net and how their authenticity can be judged.

3. Some issues in Scholarly Publishing: Peer-review, Impact Factor, Copyrights and Open Access.

This would be more of an interactive talk touching some of the frequently asked issues in the domain of scholarly publishing. It would cover Peer-review and its role in research publication and quality control. What is Impact Factors, its utility and myths? What are authors' copyrights over their articles? What is concept of Open Access? How it is in favor of scholarly community? What are resources for Open Access Journals and Repositories.

(2) LARGE BOWEL STRICTURES – A HISTOPATHOLOGICAL REVIEW

Dr. Alpa A. Shah, Dr. Jignesh J. Ramani, Dr. Brijesh, Dr. Dipak Joshi

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ABSTRACT :

BACKGROUND : Stricture of the large bowel develops as complication of numerous disorders. Our aim is to study prevalence, etiologies, incidence in both sex and different age and histological patterns of various large bowel strictures and also to compare with other relevant studies. Large bowel stricture is common in 3rd to 5th decades. However, in 3rd decade, inflammatory bowel disease, predominantly tuberculosis, is common lesion, while in later age, malignancy is common lesion.

METHODS : Tuberculosis, followed by adenocarcinoma is the most common cause of large bowel stricture in our community. Tuberculous strictures of large bowel are more common in female than in male. Adenocarcinoma of colorectum causing large bowel strictures is slightly

more common in male and adenocarcinoma with mucinous differentiation is even more common in male.

RESULTS : Caecum is most common site for tuberculous stricture of large bowel. Ratio of adenocarcinoma of Rt. colon to left colon is 1: 1.6. Epithelioid cell granuloma, langhan's type giant cell and caseous necrosis are constant features of tuberculosis. In 55% cases of tuberculous strictures of large bowel, the lymph nodes were involved in tuberculous inflammation.

CONCLUSION : 60% of all adenocarcinoma causing large bowel stricture are mucin secreting. In 46% adenocarcinoma, papillary pattern is seen. Lymph nodes are involved in 33.3% cases.

KEY WORDS : Large bowel, Strictures, Tuberculosis, Histopathology

INTRODUCTION :

Stricture of the large bowel develops as complication of numerous disorders and presence of stricture has potential to cause chronic obstructive symptoms that are progressive in some cases.[1] Acute obstruction can also occur in presence of either impacted feces or obstruction in stricture.

Bowel obstruction is clinical diagnosis and wide range of causes may underlie it. Management of such patient varies widely depending upon the etiology i.e. colectomy for carcinoma, while conservative or local resection for strictures secondary to ischemia[2] and corticosteroid for crohn's disease, while AKT for tuberculosis (corticosteroid is contraindicated).[3]

Clinical, radiological and gross examinations don't help in differentiating them. So, histopathological examination remains the final arbiter of nature of the disease. Like wise in hirsprung's disease, the full thickness biopsy is the only method to determine the extent and adequacy of excision.

This, therefore, emphasizes the importance of accurate histopathological interpretation of the large bowel strictures.

MATERIALS AND METHODS:

Present study consists of 'Large bowel strictures- A histopathological review'. Cases for this study were drawn from the surgical pathology files. Total 50 cases were studied. Hematoxyline-Eosin stained sections from 24 hour formalin fixed tissue were available for examination. Clinical data was obtained from the indoor case paper of patients. Each case was studied for presenting complaints, detailed history, clinical examination, investigations and histopathological examination of specimen.

RESULTS:

No. of cases studied: 50.

The prevalence of various etiologies of large bowel strictures is as follows.

Table 1

No.	Lesion	No. ofcases	%
1	Tuberculosis	20*	40%

2	Crohn's disease	02	04%
3	Non-specific colitis	05	10%
4	Eosinophilic colitis	02	04%
5	Ischemic colitis	01	02%
6	Adenocarcinoma and variants	15*	30%
7	Squamous cell carcinoma[@]	03	06%
8	Carcinoid tumour	01	02%
9	Cloacagenic carcinoma	01	02%
10	Hirsprung's disease	01	02%

*Case 1 has both lesions: tuberculosis of appendix and adenocarcinoma of Caecum
@ Squamous cell carcinoma of ano-rectum.
Tuberculosis followed by adenocarcinoma and its variants is the most common cause of large bowel strictures.

Distribution of these lesions in both sexes is as follows.

Table 2

No.	Lesion	Male	Female	M:F
1	Tuberculosis	05	15*	1:3
2	Crohn's disease	02	-	-
3	Nonspecific colitis	02	03	1:1.5
4	Eosinophilic colitis	01	01	1:1
5	Ischemic colitis	01	-	-
6	Adenocarcinoma and variants	09	06*	1.5:1
7	Squamous cell carcinoma[@]	02	01	2:1
8	Carcinoid tumour	-	01	-
9	Cloacagenic carcinoma	-	01	-
10	Hirsprung's disease	01	-	-
Total		23	27*	1:1.2

@ Squamous cell carcinoma of ano-rectum.

This study shows :
- Tuberculosis is more common in female than in male.
- Adenocarcinoma is more common in male than in female.

Distribution of these lesions in various age groups is as follows.

Table 3

No.	Lesion	01-10[@]	11-20	21-30	31-40	41-50	51-60	61-70	71-80
1	Tuberculosis	-	-	11	04	05*	-	-	-

2	Crohn's disease	-	-	01	01	-	-	-	-
3	Nonspecific colitis	-	-	-	01	01	02	01	-
4	Eosinophilic colitis	-	-	01	-	-	01	-	-
5	Ischemic colitis	-	-	-	-	01	-	-	-
6	Adenocarcinoma and variants	-	-	03	01	04*	05	01	01
7	Squamous cell carcinoma[@]	-	-	-	-	01	02	-	-
8	Carcinoid tumour	-	-	-	-	-	01	-	-
9	Cloacagenic carcinoma	-	-	-	-	01	-	-	-
10	Hirsprung's disease	01	-	-	-	-	-	-	-
Total		01	00	16	07	12*	11	02	01

@ age in years.

This study indicates that large bowel stricture is common in 3rd to 5th decade (70%). However, in 3rd decade inflammatory bowel disease (81.25%), predominantly tuberculosis is common lesion, while in later age, malignancy (72.7%) is common lesion.

The distribution of site of stricture for various etiologies is as below.

Table 4

Site	Tuberculosis	Carcinomas	Other IBD	Other	Total
Caecum	16*	06[@]	07	-	29*[@]
Ascending colon	03	02	-	-	03
Transverse colon	-	02	-	-	02
Descending colon	-	-	-	-	00
Sigmoid colon	-	03	-	-	03
Ano-rectum	-	09	03	01	13
Appendix	02*[@]	-	-	-	02*[@]
Total	20[@]	20[@]	10	01	50

Case 42 has tuberculous involvement of both appendix and caecum.

@Case 1 has tuberculosis of appendix and carcinoma of caecum.

In 20 cases of tuberculosis microscopic features were as follows.

Table 5

Case No.	Granulomas	Langhan's type giant cells	Caseous necrosis	LN involvement
01	++	++	++	-
04	++	++	++	++
05	+	+	-	-
09	++	++	++	++
11	++	++	-	++
15	++	++	++	-
17	++	++	++	++
19	++	++	++	-

22	++	++	-	++
23	++	++	++	++
26	++	++	-	++
27	++	++	++	-
31	++	-	++	-
35	++	++	++	++
40	++	++	-	-
41	++	++	+	++
42	++	++	+	-
43	++	++	+	++
46	++	-	-	++
48	++	++	-	-
	20	18	13	11

+= Ill-formed Epithelioid cell granuloma or occ. Langhan's type giant cells or small foci of caseous necrosis.

+++= Well-formed Epithelioid cell granuloma or many Langhan's type giant cells or confluent caseous necrosis.

In two cases of crohn's disease microscopic features are as follow.

Table 6

Case No	Transmural inflammation	Non-caseating granulomas	Lymphoid follicles with germinal centers	Submucous edema	LN involvement
07	++	++	++	-	++
25	++	-	++	++	-

In 15 cases of adenocarcinoma the microscopic features are as follows.

Table 7

Case No.	Papillary pattern	Mucin secretion	Tumor necrosis	Infiltration upto	LN involvement
01	++	++	-	B	-
02	-	++	-	A	++
03	-	++	-	A	-
06	++	-	++	A	-
10	++	++	-	B	-
12	++	-	++	B	-
13	++	-	++	A	++
18	-	-	++	NA	NA
24	-	-	++	B	-
28	-	++	-	NA	NA
29	-	++	-	NA	NA
37	-	++	-	B	-
38	++	-	-	A	++
44	-	++	-	B	++

47	++	++	++	B	-
	07	09	06		04

NA- not applicable (because biopsy specimen sent)
A- Infiltration up to serosa. B- Infiltration beyond serosa into surrounding structures.
The grade of differentiation of these tumours is as follows.

Table 8

Well differentiated	01	6.6%
Moderately differentiated	13	86.8%
Poorly differentiated	01	6.6%

This indicated that most are moderately differentiated adenocarcinoma.
The distribution of adenocarcinoma in respect of mucin secretion is as follows.

Table 9

Mucinous adenocarcinoma*	09	60%
Non-mucinous adenocarcinoma	06	40%

* This includes both pour mucinous adenocarcinoma as well as adenocarcinoma with mucin secretion.

DISCUSSION:

In our study of 50 cases of large bowel stricture, tuberculosis is the most common etiological factor, as also observed in earlier studies. (Tandan and prakash)[4]. In study of intestinal tuberculosis in urban Britain, 75% of tuberculous patients were Asian immigrants.[3]

SEX DISRIBUTION OF LARGE BOWEL STRICTURES:

In study by Tandan and prakash[4] of 159 cases of tuberculosis, the M:F ratio was 1:2 and 10 cases of crohn's disease, the M: F ratio was 4: 1. In urban Britain study of 42 cases of abdominal tuberculosis by Palmer and patil[3], the M:F ratio was 1: 1.1.

In present study, M: F ratio for tuberculosis is 1:3 and two cases of crohn's are observed in male patients.

No noticeable sex difference was found in adenocarcinoma of bowel by Schofield and Jonce.[5]

In present study, the M: F ratio for adenocarcinoma is found to be 1.5:1.

In study of 132 cases of mucinous carcinoma of colon and rectum by Symond[6], the M: F was 1.4: 1, while it was 1: 1.2 in study of 49 cases by Bruce D Minsky.

In present study it is 3.5:1.

AGE DISTRIBUTION OF LARGE BOWEL STICTURES :

In study of 159 cases of intestinal tuberculosis by Tandan & Prakash[4], the commonest age group affected was 20-39 and for crohn's disease, it was 3rd and 4th decade. In study by Palmer & Patil[3] of intestinal tuberculosis, the mean age of affection is 34. The mean age of affection for crohn's disease is 37 in study by Glass & Backer.[7]

In present study, tuberculosis is common in 3 decade (55%), while one case of crohn's disease was found in 3rd and other in 4th decade.

moderately differentiated. The cloacagenic carcinoma showed poorly differentiated tumour cells, pigmentation in stroma and tumour necrosis. H Fderspiel[13] at el. studied 84 cases of carcinoid of colon and rectum and observed that trabecular, glandular, insular and mixture of these are most common histological patterns. In our study, one case (No. 45) of Carcinoid tumour and in one case (No.47), small area of carcinoid like differentiation in otherwise mucin secreting adenocarcinoma is seen.

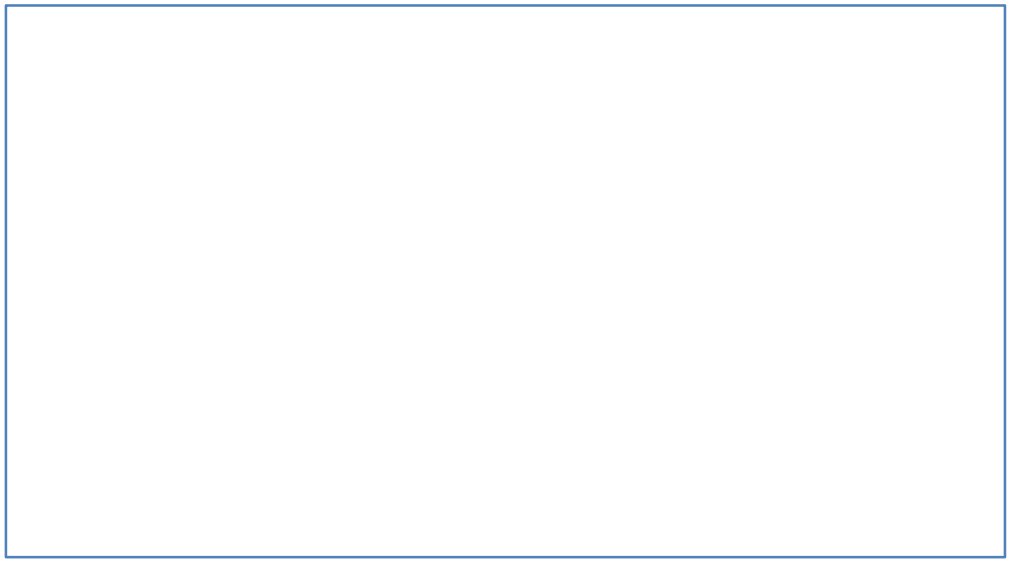

Image 6: Carcinoid tumours – cells are small round and of regular size shape arranged in nests.

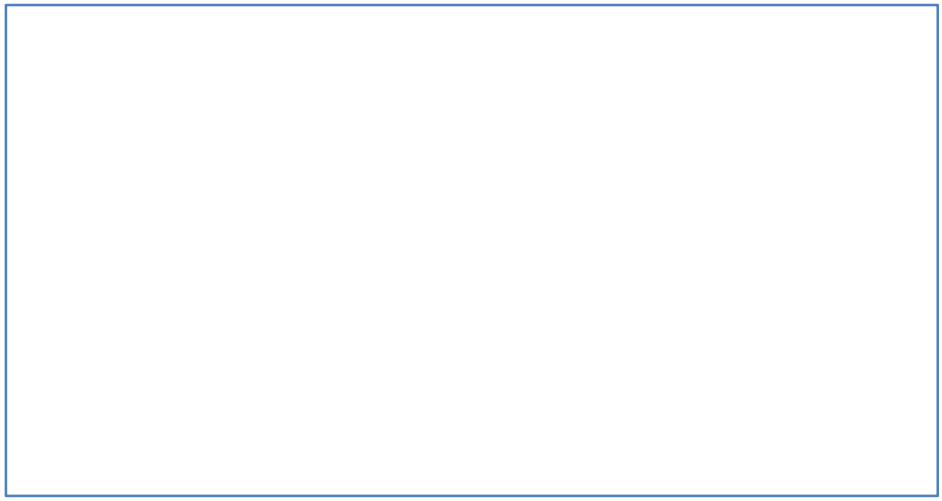

Image 7: Squamous cell carcinoma – anal canal

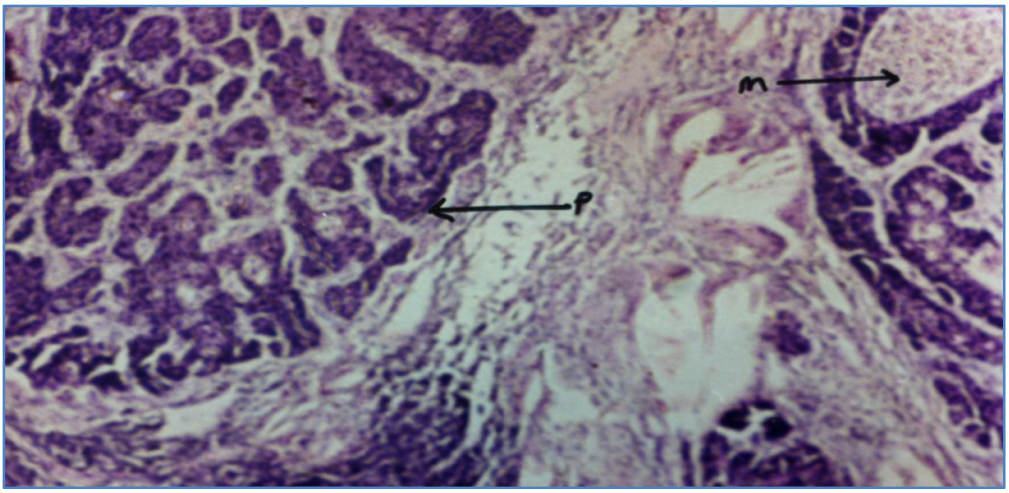

Image 8: Papillary adenocarcinoma with mucinous features – It shows papillary pattern of growth and mucinous pools

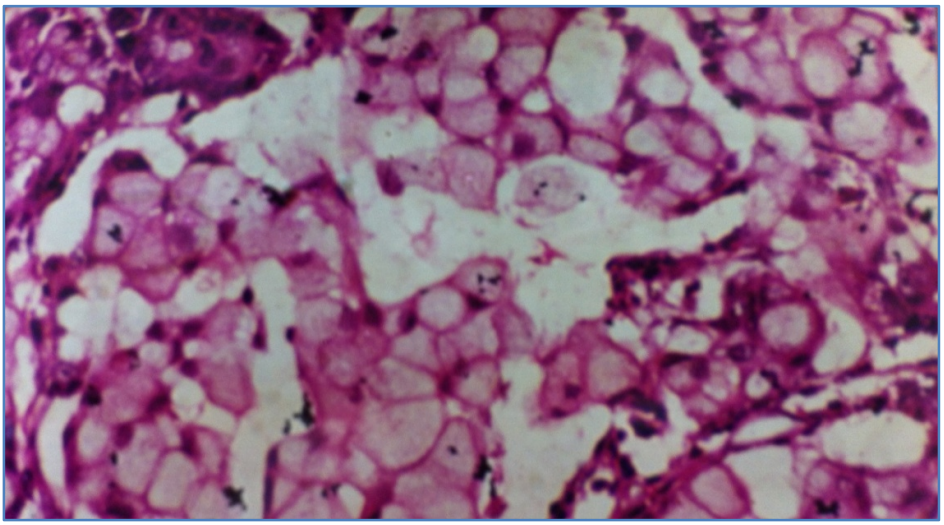

Image 9: Adenocarcinoma with signet ring cells. (High power) – It shows typical signet ring cells.

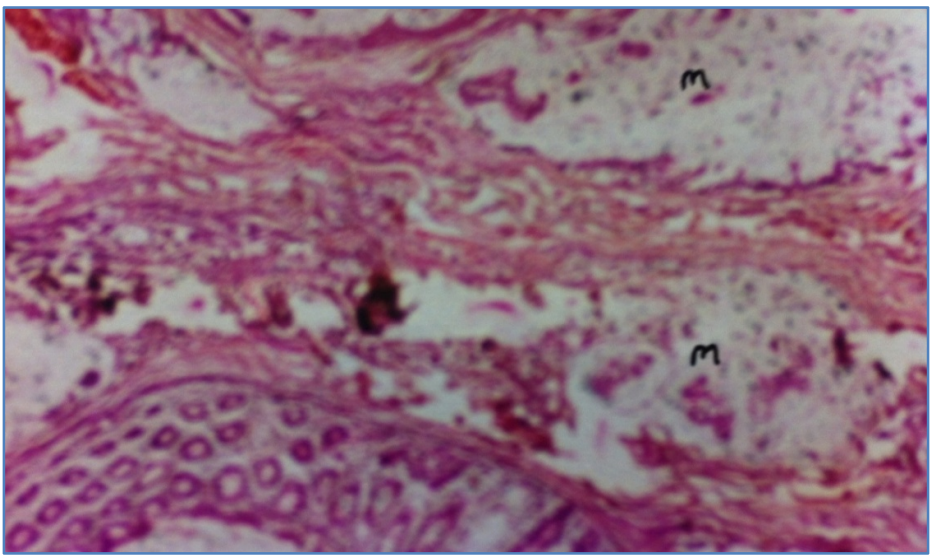

Image 10 : Mucinous Adenocarcinoma – It shows large mucinous pools

Strictures due to other inflammatory diseases like amebiasis, lymphogranuloma venerum and schistosomiasis; enteric coated NSAIDs; radiation injury; endometriosis and congenital colonic stenosis are not common in our community.

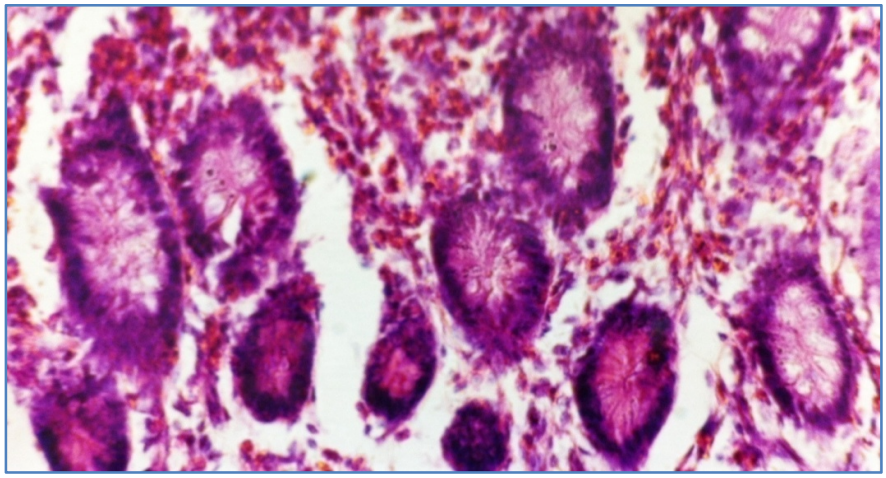

Image 11: Eosinophilic colitis – Glands are surrounded by eosiniphilic infiltration.

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(3) A RANDOMIZED TRIAL COMPARING INTRAVENOUS IMMUNE GLOBLULIN AND PLASMA EXCHANGE IN GULLAIN – BARRE SYNDROME

Dr. Cecil Parmar*, Dr. Chirag Patel, Dr. N. M. Kadari, Dr. Vishal Sharma, Dr. Swati Trivedi**

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ABSTRACTS :

BACKGROUND : The sub acute demyelinating polyneuropathy knows as Gullian –Barre syndrome improves more rapidly with plasma exchange. We conducted study of 50 patients to compare response of plasma exchange vs IVIG.

METHODS : we have enrolled patients who had been diagnosed as gullian –barre dyndrome , which include clinical laboratory and electrophysiological diagnostic features. They were randomly assigned to receive either five plasma exchanges (50 ml/kg) on five separate sitting over 1-2 weeks or five doses of IVIg (0.4g /kg per day).The predefined outcome measure was improvement at four weeks by at least one grade of motor function.

RESULTS : Median time to start recovery after plasma exchange was 6 days compare to 5 days of IVIG. 70 % of patients improve more than one grade at 4 weeks compare to 69.23% of IVIG.

CONCLUSION : In the acute Gullian-Barre syndrome, treatment with IVIg is at least as effective as plasma exchange.

KEY WORDS : gullian barre syndrom. Plasma exchange, IVIG.

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INTRODUCTION : Guillain-Barré syndrome (GBS) is an acute, frequently severe and fulminant polyradiculoneuropathy that is autoimmune in nature, most commonly characterized by a rapidly progressive, essentially symmetric, ascending flaccid paresis, weakness and are flexia. Multifocal segmental demyelination is the main underlying pathology of the disease. Molecular mimicry and a cross-reactive immune response play a crucial part in its pathogenesis, at least in those cases with a preceding Campylobacter jejuni infection and with antibodies to gangliosides.

Intravenous immunoglobulin (IVIg) and plasma exchange are Effective treatments in GBS. Despite medical treatment, GBS often remains a severe disease; 3–10% of patients die and 20% are still unable to walk after 6 months. In addition, many patients have pain and fatigue that can persist for months or years.

MATERIAL AND METHODS : A In The Present Study The Diagnosis Was Established By Criteria Of National Institute Of Neurological And Communicable Disorders And Stroke (NINCDS).

CRITERIA FOR DIAGNOSIS :

In Classic Cases Diagnosis Is Easy. But In Few Cases It Becomes Difficult. The Following Criteria, Laid By NINCDS in 1978 Help in the Diagnosis, Which Include Clinical Laboratory and Electrophysiological Diagnostic Features.

(A) Features Required For Diagnosis

- Progressive Weakness of More Than One Limb Due To Neuropathy.
- Areflexia or Marked Hyporeflexia.

(B) Features Strongly Supportive Of Diagnosis

I. Clinical Features

- Progression of Symptoms and Signs over Days Up to 4 Weeks.
- Relative Symmetry of Symptoms.
- Mild Sensory Symptoms or Signs.
- Cranial Nerve Involvement Especially Facial Diplegia.
- Recovery Beginning 2-4 Weeks After the Progression Ceases.
- Autonomic Dysfunction.
- Absence of Fever At The Onset Of Illness.

II. CSF Picture

- Elevated CSF Protein After 1 Week Of Symptoms.
- Cell Counts Of <10 Mononuclear Leucocytes per Mm of CSF.

III. Electro diagnostic Studies

- Evidence Of Nerve Conduction Slowing Or Block.

(C) Features Making the Diagnosis Doubtful

- Marked Persistent Asymmetry of Weakness.
- Marked Bladder or Bowel Dysfunction At The Onset or Its Persistence There on.
- Presence of Polymorphonuclear Leucocytes or > 50 Mononuclear Leucocytes Per C. Mrn of SF.
- Sharp Sensory Level.

(D) Features Excluding the Diagnosis

1. Diagnosis of Acute Intermittent Porphyria or Recent Diptheria
2. Diagnosis of Botulism, Poliomyelitis, Hysterical Paralysis, Toxic Neuropathy (Lead, Nitrofurantoin, Dapsone) or History of Hexacarbon Abuse.
3. Purely Sensory Syndrome

50 Patients Who Fulfilled The Clinical Criteria Of NINCDS For Guillain-Barre Syndrome During Period From August, 2010 To August, 2012 Were Included In The Study. Patients <12 Years of Age, Patients with Severe Unrelated Medical Illness. Patients with Duration of Illness More Than 4 Weeks Were Excluded From Study. Detailed Clinical History Recording And Examinations Were Carried Out In Each Patient. Routine Laboratory Investigations I.E. Hemogram, Urine Analysis, Blood Sugar, Blood Urea, Serum Creatinine, Electrolytes, ECG, X-Ray-Chest, Were-Done In All Cases. CSF Was Examined Bio chemically And Cytologically in Majority of Patients.

Mode of Treatment

After Knowing The Clinical Profile, Patients Were Divided 'Into Three Groups Considering The Line of Management.

1. Those who underwent Plasma Exchange with Supportive Measures.
2. Those who Received IV Gamma Globulin Along With Supportive Measures.
3. Those who received supportive care.

Plasma Exchange Was Done In IHBT Department, CHA With Baxter Plasmapheresis Machine (Continuous Flow). 5 Cycle Of 50ml/Kg Exchange Was Done Over 8-13 Days. Replacement Fluid Was Either “Albumin & Normal Saline” Or “Fresh Frozen Plasma”.
In Ivlg Group Of Patients, Ivlg Was Given In Dose Of 0. For 5 Days.4 G/Kg Daily

ASSESSMENT :

For all patients, clinical assessment was done using Hughes GBS disability score at admission, at starting treatment, at maximum worsening of illness, at 4 weeks of end of treatment.
Hughes scale was used for assessment. Guillain-Barre syndrome disability scale (Hughes et al., 1978)

0. Healthy
1. Minor symptoms or signs of neuropathy but capable of manual work/capable of running
2. Able to walk without support of a stick (5 m across an open space) but incapable of manual work/running.
3. Able to walk with a stick, appliance or support
4. Confined to bed or chair bound
5. Requiring assisted ventilation (for any part of the day or night)
6. Death

Outcome was measured in terms of median time to start recovery after treatment, no. of patients with improvement in disability grade at 4 weeks of treatment, mean improvement in disability grade at 4 weeks of treatment, median days to improve 1 grade of treatment

DISCUSSION

50 Patients, who fulfilled the clinical criteria of NINCDS for Guillain-Barre syndrome during period from august, 2010 to August, 2012 were included in the study.

Table – I response to treatment

Course	PE (n=30)	IVIg (n=13)	Supportive (n=7)
Median time to start recovery after treatment	6 days	5 days	9 days
No. of patients with improvement ≥1 grade at 4 weeks of treatment	21(70%)	9(69.2%)	2(28.57%)
Mean improvement in disability grade at 4 weeks of treatment	1.1	1	0.28
Median days to improve 1 grade of treatment	12 days	13 days	20 days

There is significant difference in number of patient's improved one grade at 4 weeks of treatment in plasma exchange group 70% & IVIg 69.2%, compared to supportive group 28.57%.

Median days for onset of recovery from start of treatment were comparable in plasma exchange group (6 days) and IVIg groups (5 days) while it is more in conventional group 9 days. Median days taken to improve one grade was comparable in plasma exchange group (12 days) & IvIg group (13 days) while more in conventional group (20 days).

There was no significant difference in mean improvement of disability grade at 4 weeks between PE (1.1) & IVIg (1.0) group.

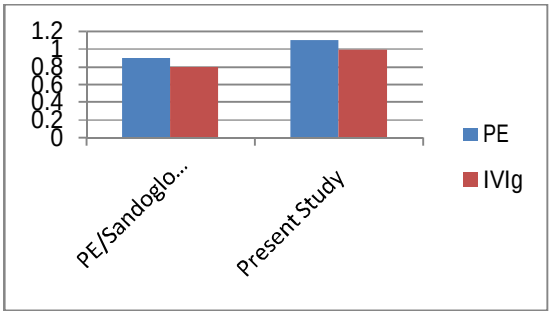
Table –II : Comparison of Plasma Exchange & Supportive group

Study	% Of patients improved ≥1 grade at 4 weeks in PE group	% Of patients improved ≥ grade at 4 weeks in supportive group
The GBS study group,1985	59%	39%
Osterman et al,1984	77.7%	30%
Present study	70%	28.7%

Present study has comparable result to The GBS study group & Osterman et al so far as percentage of patients improved ≥1 grade at 4 weeks from start of treatment is considered. 70% of patients undergoing PE improved ≥1 grade as compare to only 28.7% in supportive group. So there is significant improvement in outcome of patients undergoing PE as compared to patients taking supportive care only.

Table-III Comparison of mean improvement of disability scale at 4 weeks between PE & IVIg group.

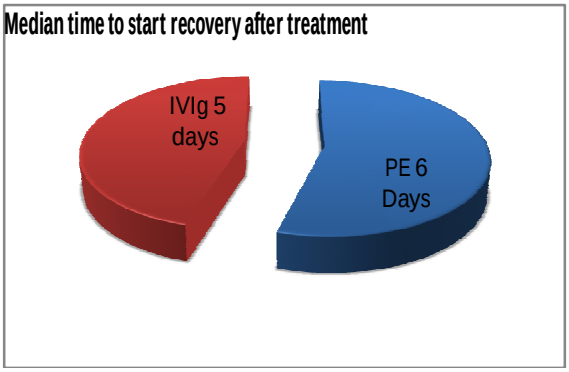
Study	PE	IVIg
Plasma Exchange/Sandoglobulin Guillain-Barre Syndrome Trial Group,1997	0.9	0.8
Present Study	1.1	1

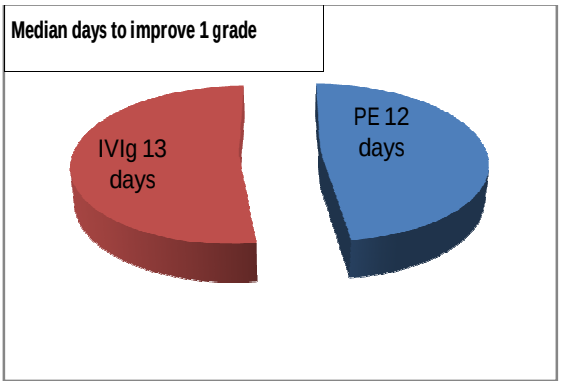


There is no significant difference in mean improvement of disability scale among patients taking IVIg & undergoing PE. Thus, PE and IVIg had equivalent efficacy.

Table-IV Comparison of other outcome between IVIg & PE

Other outcome	PE (n=30)	IVIg (n=13)
Median time to start recovery after treatment	6 days	5 days
% of patients with improvement ≥1 grade at 4 weeks of treatment	70%	69.23%
Median days to improve 1 grade	12 days	13 days





There is no significant difference between IVIg & PE in terms of median time to start recovery, no. of patients improved ≥1 grade & median days to improve 1 grade.

We reviewed previous studies comparing outcome between IVIg & PE,most of them show no significant difference. Diener et al., 2001, Garcia et al., 1985, Nomura et al., 2000, Plasma Exchange/ Sandoglobulin Guillain-Barre Syndrome Trial Group, 1997.

This study cannot carry the same weight as a prospective randomized clinical trial, but the results are comparable. Thus supports the role of plasma exchange or IVIg in acute GBS.
Table-V Comparison of other outcome between IVIg & PE

Other outcome	PE (n=30)	IVIg (n=13)
Median time to start recovery after treatment	6 days	5 days
% of patients with improvement ≥1 grade at 4 weeks of treatment	70%	69.23%
Median days to improve 1 grade	12 days	13 days

CONCLUSION : 50 patients of GBS were studied. 30 patients treated with plasma exchange were compared with 13 patients who received high dose IV gamma globulin & 7 patients who received supportive treatment only.

Immunotherapy definitely makes a difference in the recovery of GBS patients. PE and IVIg are equally effective. Although IVIg has advantage of ease to administer & lesser side effects, but, it is costly. PE is less costly than IVIg, but its main limitations would be availability of the technical expertise and support. So decision regarding use of either PE or IVIg should depend upon availability of resources and patient's affordability.

Supportive care in addition to Immunotherapy are also important. Proper nursing care, nutrition, management of dysautonomia, prevention of infection, DVT prophylaxis & physiotherapy are valuable.

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(4) DOES THE NUMBER OF CIGARETTES SMOKED PER DAY AFFECT THE AGE OF ONSET OF ACUTE MYOCARDIAL INFARCTION AND SERUM TOTAL CHOLESTEROL?

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ABSTRACT

INTRODUCTION : The habit of Smoking is uniquely human and is indulged in almost all over the world in different forms. It is done solely for personal pleasure and satisfaction. Tobacco is smoked by people in various forms and variable quantities wherein some people are just 'Casual smokers' while many others are 'Chain smokers'.

OBJECTIVE : The present study was conducted with a motive to compare and evaluate the effects of moderate and heavy smoking on serum cholesterol levels and the age of onset of Acute Myocardial Infarction (AMI).

METHOD : The study was conducted on 16 moderate smokers (smoking<15 cigarettes/day) and 20 heavy smokers (smoking≥15 cigarettes/day) who were admitted in the cardiology unit of J.J. Hospital Mumbai. Patients thus admitted were checked out for their cholesterol levels and age of onset of AMI and further compared with their smoking history.

RESULTS : On analysis it was revealed that Heavy smokers had a highly significant ($p<0.001$) increase in serum total cholesterol levels than moderate smokers. Further it was also found that heavy smokers presented with AMI at a much earlier age than the moderate smokers ($p<0.001$).

CONCLUSION : Heavy Smoking habit thus shown to be a higher contributor to cardiovascular disease than moderate smoking should definitely be prevented and avoided.

KEY WORDS : Moderate smokers, Heavy smokers, Age, Myocardial Infarction Serum total Cholesterol

INTRODUCTION :

Worldwide tobacco consumption is considered as a major health concern. Tobacco use is done mainly in two forms 1) smokeless tobacco and 2) smoked tobacco. Khaini, jarda,gutkha,etc. are examples of smokeless tobacco where the tobacco is consumed without the burning process. The smoked variety of tobacco is consumed in the form of cigarettes,bidis,cigars,hookas,etc. As the variability exists with the mode of tobacco intake, similarly different persons are addicted to tobacco in variable quantities. Some people are just 'casual' smokers who smoke a few cigarettes per day, while others are 'chain' smokers smoking quite a sizeable number of cigarettes daily.

Smoking tobacco has come to be recognized as a major contributor in the mortality and morbidity of Ischaemic heart disease. Carbon monoxide and nicotine are some of the toxic byproducts of smoking. The increased carbon monoxide in the blood of cigarette smokers damages the endothelium and facilitates the entry of cholesterol into the wall of the artery. Harmful effects like atherosclerosis, tissue anoxemia, platelet aggregation and vasospasm in the blood vessels of smokers also seem to be carried upon by nicotine and carbon monoxide which are released in the blood due to smoking. Smoking also seems to affect the plasma lipids and lipoproteins including Serum Total Cholesterol as hinted upon by many recent studies. The practice of smoking hardly has any age bars, with increasing incidence seen in the form of children too getting addicted to this deadly habit. Early onset of this habituation is also

leading to an early onset of various cardiac and pulmonary diseases. Amongst the cardiac diseases IHD and Myocardial Infarction seems to be the priority of investigation amongst various studies.

The present study was thus carried out with intent to determine the effect of intensity of smoking on the serum cholesterol level and the age of onset of AMI.

MATERIALS AND METHODS

Patients admitted in the Intensive cardiac care unit under the cardiology department of Grant Government Medical College and J.J. Hospital were included in the present study. A detailed history was taken regarding their smoking habits which included the information about the number of cigarettes smoked per day. On the basis of the above history taking patients were classified as Heavy smokers who smoked 15 or more cigarettes per day and moderate smokers who smoked less than 15 cigarettes per day. 20 heavy smokers and 16 moderate smokers thus comprised the present study.

Diagnostic criteria for acute myocardial infarction were established by the treating clinicians on the basis of the presence of at least two of the following criteria:

1) Characteristic Chest pain
2) ECG changes with appearance of Q waves(transmural infarction)
3) Characteristic elevation of Serum aspartate aminotransferase or serum creatinekinase.
4) Non-Transmural infarction was diagnosed by typical ST segments and T wave changes accompanied by at least criteria No. 3

The selection of the patients as subjects for the present study was done on the basis of the following Criteria:

EXCLUSION CRITERIA:

Certain diseases as mentioned below were looked for and excluded to avoid them interfering with the present study.

1) **Hypertension :** Subjects were excluded if they had hypertension or were receiving antihypertensive medication.
2) **Diabetes Mellitus :** Patients with Fasting Blood Sugar (FBS) less than 120 mg/dl were chosen.
3) **Obesity :** Patients who were not overweight for their height and age were selected.
4) **Hypothyroidism :** Serum T3, T4 and TSH levels were seen to exclude hypothyroidism.
5) **Nephrotic syndrome:** This was excluded on the basis of the clinical judgment and acumen of the clinicians.
6) **Obstructive Liver Disease :** This was excluded on the basis of serum bilirubin(Total and Direct).

INCLUSION CRITERIA :

AGE : Male patients in the age range of 35-75 years after noting down their age have been included.

SEX : Only male patients were considered for the present study to avoid the variation in the values due to gender differences.

SOCIOECONOMIC STATUS : all patients chosen belonged to the middle socioeconomic status. Total serum cholesterol was estimated by collecting Fasting blood samples of the subjects and then using the standard CE-CO PAP Enzymatic End point Method. (1,2).Total Cholesterol Values were measured in mgs/dl.
All the results thus obtained by Laboratory analysis were noted down and subsequently used for statistical analysis.

STATISTICAL ANALYSIS

The statistical analysis of the data obtained for heavy and moderate smokers were done using Chi square test and ANOVA. p values < 0.05 was considered significant and the p values< 0.001 was considered highly significant. For the analysis of the data Microsoft Excel Software was also used. Results obtained in the study are expressed as mean ± SD.

OBSERVATION AND RESULTS

Serum Total cholesterol levels and the age of onset of AMI were compared in the Heavy and moderate Smokers. When Serum Total cholesterol levels were analyzed it was revealed that the heavy smokers had a highly significant (p<0.001) increase in the serum total cholesterol levels as compared to those of the Moderate smokers.

Similarly when Age of onset of AMI was compared it was found that the Heavy smokers had a highly significant (p<0.001) earlier onset of AMI as compared to those of the Moderate Smokers.

Table showing the Serum Total Cholesterol levels and the Age of onset of AMI in the Heavy Smokers and Moderate Smokers.

	Serum Total Cholesterol levels in mg/dl	**Age of onset of AMI in Years**
Moderate Smokers	199.75±9.34	55.50±9.78
Heavy Smokers	227.50±13.87	43.40±6.00
Significance	p<0.001(H.S.)#	p<0.001(H.S.)##

Footnote – all the values in the table are expressed as mean ± SD

H.S.-Highly Significant

Comparison of Serum total cholesterol levels between heavy smokers and moderate smokers.
Comparison of Age of onset of AMI in heavy smokers and moderate smokers.

DISCUSSION

Smoking has been widely associated with various deleterious effects in the human body. Chiefly among the effects are the atherogenic effects of smoking which has come to be recognized as a formidable risk factor in the morbidity and mortality of coronary heart disease and ischaemic heart disease. The risks associated with the smoking habit are often attributed to the byproducts of smoking like nicotine, carbonmonoxide and the tar content of the cigarettes. Nicotine and carbonmonoxide which are released in the blood during smoking seem to play a major role in producing the lethal effects like enhanced platelet aggregation, damaged endothelium, vasospasm, tissue anoxemia and atherosclerosis in the blood vessels. (3,4)The buildup of carboxyhemoglobin leads to a reduced oxygen carrying capacity of blood

which is accompanied by a decreased tissue utilization of oxygen at the myoglobin level. (5)These effects cumulatively does have a dampening effect upon the myocardium.

Different researchers have studied the effects of heavy and moderate smoking on cardiac disease pattern.

Gardon Tavia et al in 1974 (6) had observed a higher rate of coronary heart disease and mortality in smokers smoking more than 10 cigarettes a day as compared to people smoking less.

Similarly Kaffman David et al in 1983(7) has in his study showed a increased risk of myocardial infarction with an increase in the number of cigarettes smoked per day.

Oscar Averbach et al in 1976(8) in his study on 1056 men had observed a increase in percentage of advanced atherosclerosis with an increase in the number of cigarettes smoked per day.

Studies done by some researchers have also highlighted the effect of the number of cigarettes smoked per day on serum cholesterol and lipid levels.

Hijermann ingver et al in 1976(9) had studied the inter correlation between serum cholesterol, cigarette smoking and body weight. This study showed that serum cholesterol increases with increasing daily number of cigarettes.

Cheryl Brischetto et al in 1985(10) had studied the plasma lipid and lipoprotein profiles of cigarette smokers from randomly selected families and had shown that the heavier cigarette smokers had a significantly higher VLDL and Total serum cholesterol than those smoking less. The above findings were consistent with our own study in which it was found that the heavy smokers had a highly significant ($p<0.001$) increase in the serum total cholesterol levels as compared to those of the moderate smokers.

Relating the effects of smoking on plasma cholesterol a possible mechanism could be attributed to the fact that nicotine released from smoking stimulates the secretion of nor epinephrine ,epinephrine as well as other hormones like cortisol(10,11,12).Such catecholamines activate the adenyl cyclase of adipose tissue which causes lipolysis of the stored triglycerides and the release of free fatty acids (FFA) into the plasma.(7,10,13).This further results in the increased secretion of hepatic FFA and hepatic triglycerides in the blood stream.(14,15)The above factors thus contribute to the development of Dyslipidemia which is a well established risk factor for the development of CAD.

Kershbaum et al (16) reported that chain cigarette smoking increases plasma FFA levels 3-fold over the baseline value. This point toward the increased risk involved with smoking more number of cigarettes per day, thereby outlining the heavier risk involved with heavy smokers as comparison to moderate smokers.

Worldwide individuals at a very young age are regularly falling prey to this lethal habit of smoking, thus affecting the age of incidence of CHD and IHD. The number of years that an individual actively smokes is also increasing because of this early habit of smoking in these youngsters

Tamsin Lisa et al in their 1985 study (17) had shown that smoking is a risk factor for cardiovascular disease and may contribute to the occurrence of AMI at a younger age.

A study done by Doll Richard et al in 1976(18) has also shown a twofold increase of death rate among young smokers as compared to non smokers.

Singler et al in 1955(19) had examined the records of 1520 cases of coronary heart disease and found that the higher the degree of smoking the earlier was the onset of the clinical manifestations of cardiac disease.

Similar to the above study our study too revealed that when Age of onset of AMI was compared it was found that the Heavy smokers had a highly significant ($p<0.001$) earlier onset of AMI as compared to those of the Moderate Smokers.

The effects of Cigarette smoking like transient increase in adhesiveness of platelets, acceleration of heart rate and making the myocardium more vulnerable to ventricular fibrillation along with acute rise in the catecholamines and fatty acids are often provoked 20 or more times a day with each inhaled cigarette in heavy smokers. Due to this repetitive insult to the coronary tissues, eventually, myocardial infarction or sudden death is precipitated earlier in Heavy smokers with a already compromised coronary circulation. (20)

CONCLUSION AND SUMMARY

The present study thus brings to light the adverse effects that heavy smokers have in comparison to their moderate counterparts. Total cholesterol was found to be significantly higher in heavy smokers than the moderate smokers thus contributing to greater risk factors. Similarly age of onset of myocardial disease was seen to be significantly earlier amongst the heavy smokers. Both the above findings thus highlight the redundant effects that heavy smoking can have on the general population.

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(5) CORRELATION OF END TIDAL CARBON DIOXIDE WITH ARTERIAL CARBON DIOXIDE DURING CARDIOPULMONARY BYPASS.

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ABSTRACT :
INTRODUCTION : Optimal blood gas management is subjected to pH- and alpha- state during hypothermia; Alpha state managed by maintaining constant total carbon dioxide stores during cardiopulmonary bypass (CPB) changes thermodynamic dissociation with change in temperature. pHremains constant during temperature changes. A correlation between end tidal carbon dioxide and arterial PCO2 known to be a non- invasive and safe procedure in patients undergoing Coronary artery bypass graft.

PATIENTS AND METHODS : Forty patients were maintained with normothermia and hypothermia during cardiac surgery in the current study. All patients were operated with midline sternotomy, aortic bicavalcannulation or aortic-right atrium cannulation for cardiopulmonary bypass. Arterial Blood Gas measurements (ABG) along with ETCO2 and PaCO2 monitoring were performed.

RESULTS: The patient group had undergone a variety of surgical procedures (viz. Coronary artery bypass grafting, Replacement of mitral- or aortic- valve or double valve). They were maintained on CPB with aorta cross clamp. There was no significant difference in ETCO2 and PaCO2 pressures both at normothermia as well as moderate hypothermia during CPB.

CONCLUSION: Monitoring ETCO2 reflects accurate measurements of PaCO2. Repeated sampling for ABG therefore can be avoided as a cheap, non-invasive method to ascertain the health of the patients.

KEYWORD : Cardiopulmonary Bypass, End Tidal Carbon Dioxide ($ETCO_2$), ABG

INTRODUCTION :

Optimal blood gas management during deliberate hypothermia has been subject of intense debate. (1-3) pH state and alpha stateapproaches have been advocated. The net charge (dissociation) of proteins remains constant as the temperature changes in acid–base management strategy during alpha state.

This is managed by maintaining constant total CO2 stores during CPB that allow pH and PaCO2 to follow their thermodynamically mediated dissociation changes with change in the temperature. Exogenous CO2 therefore is not added to the system during cooling. In pH state management, the constant pH value is sustained at varying temperatures. Exogenous CO2 is added in this method while the blood is cold; this would maintain a PaCO2 at 40 and pH at 7.4. Total CO2 stores thus are elevated. (4)

Several studies have observed no difference in the outcome with either of these strategies. Alpha state is easy to manage and has additional advantageas compared to pH state. Almost all centers therefore follow alpha state management strategy (5-6).

Measuring end tidal carbon dioxide (ETCO2) reflects adequacy of circulatory system and metabolism (7). A correlation between ETCO2 and arterial PCO2 (paCO2) during deep hypothermia and pH state management has been documented. (8)ETCO2 and PCO2 measurements have been documented as a non-invasive and safe procedure for healthy patients undergoing coronary artery bypass graft. (9)

The aim of this study was to find out the correlation between ETCO2 and paCO2 during moderate hypothermia and alpha state management during Cardio Pulmonary Bypass (CPB).

MATERIAL AND METHOD :

Eighty patients undergoing cardiac surgery with cardiopulmonary bypass and moderate hypothermia during November 2012 to January 2013 at U. N. Mehta Institute of Cardiology & Research Center after obtaining institutional Ethics Committee were included in this study. Patients with COPD (Chronic Obstructive Pulmonary Disease), hematological disorders, concomitant surgery, patients with >70 years age and patients undergoing reoperation surgery were excluded from the study. ETCO2 was monitored continuously with Primus (Drager, Germany) connected to membrane gas outlet portduring cardiopulmonary bypass. Nipro vital membrane oxygenator was used for all the patients. These patients were divided into two groups; each with similar number of patients. The patients were maintained either at normothermia at (37^0C) or managed with moderate hypothermia (28^0C) during the CPB. Arterial Blood Gas (ABG)was measured at (i) induction, (ii) immediately after CPB, (iii) after cross clamp and cardioplegia and (iv) every 30 minutes thereafter to look for pH, PaO2, PaCO2, hematocrit and electrolytes.ABG was also measured after protamine and before closer of the chest to check for hemostasis. Arterial Blood Gas was measured withmodel Stat Profile pHOx Plus C (Nova Biomedical, USA).

All patients operated with midlinesternotomy and aortic and bicavalcannulation or aortic and right atrium cannulation for CPB. All the patients were operated with moderate hypothermia (up to 28 degree). All patients were operated by single team of surgeon, anesthetist and perfusionist.

STATISTICS:

The statistical analysis was performed with IBM SPSS version 20. All continuous variables were presented as Mean ± SD and categorical variables were expressed as percentages.

RESULTS:

Majority of patients were males and a mean age of 45 years. They were from a variety of surgical procedures viz. CABG (25%), Mitral valve Replacement (MVR; 37.5%), Aortic Valve replacement (AVR; 22.5%) and Double valve Replacement (DVR; 15%; Table -1). They were maintained on Cardiopulmonary Bypass (CPB) for a mean of 92 minutes. The Aorta Cross Clamp (ACC) time was for a mean of 66 minutes.

End Tidal CO2 (as mm Hg) and partial pressure of CO2 *in* arterial blood (PaCO2; as mm Hg) were similar between the patients maintained either with normothermia (37^0C) or at moderate hypothermia (28^0C) announcing the utility of ETCO2 as surrogate of PaCO2 (Fig.-1).

DISCUSSION:

Arterial blood gas estimation provides an accurate information of patient's well-being.Alternatively, non-invasive methods like pulse oximetry and ETCO2 can also be used effectively. ETCO2 monitoring is used to estimate arterial PaCO2.(10) In healthy subjects, a close correlation exists between PaCO2 and ETCO2.It is accepted that PaCO2 measurements remains 2 to 5 mg higher than ETCO2.(11)

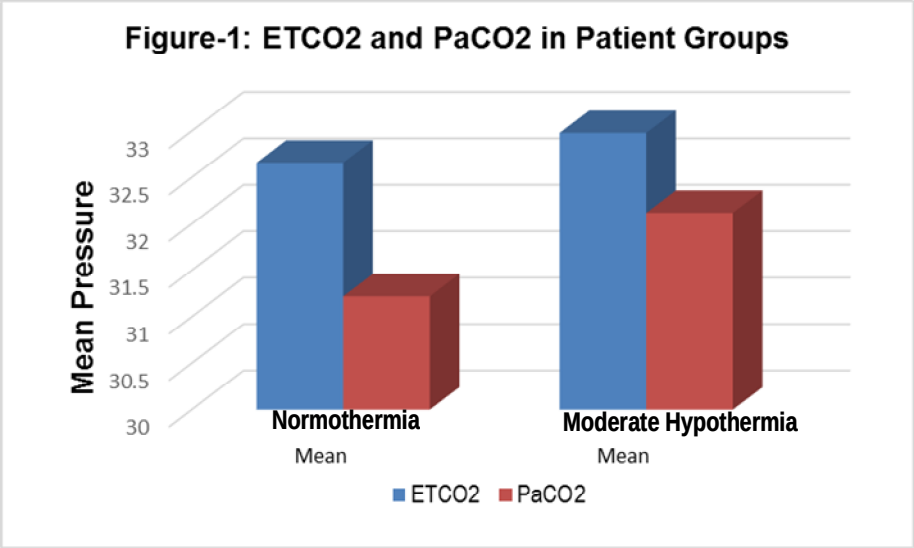
Measurement of ETCO2 has been identified as valuable tool to monitor airway patency and confirms endotrachel intubation and can be used to guide ventilation as a surrogate measure of PaCO2. (12) ETCO2 measurements are found to be sufficient to monitor PaCO2 in patients with trauma, brain injury, respiratory failure and obviates the need for repeated arterial blood gas determination (13-14).

Our results demonstrated no significant differences between ETCO2 and PaCO2 during cardiopulmonary bypass with moderate hypothermia and alpha state management for blood gases. Monitoring ETCO2 reflects almost accurate measurements of PaCO2. Repeated sampling for ABG can thus be avoided. This finding is consistent with other studies. (15) Studies with large number of patients is warranted to establish the utility of this non-invasive, less expensive method to ascertain the wellbeing of the patients undergoing cardiac surgery with cardiopulmonary bypass and moderate hypothermia.

Table – 1: Patient Characteristics

Age (Years; Mean ±SD)	**45.74 ± 15.68**
Male (Number; %)	52 (65%)
Female (Number; %)	28 (35%)
Type of Surgery	
• CABG (Number; %)	20 (25.0%)
• MVR (Number; %)	30 (37.5%)
• AVR (Number; %)	18 (22.5%)
• DVR (Number; %)	12 (15.0%)
CPB Minutes (Mean ±SD)	92 ± 38
ACC Minutes (Mean ±SD)	66 ± 28

Figure-1 is with Legend



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(6) A COMPARATIVE STUDY OF THE STATUS OF BINOCULAR VISION AND ACCOMODATION WITH SPECTACLES AND CONTACT LENSES IN MYOPES.

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ABSTRACT

BACKGROUND :

This study aimed to understand the changes occurring in accommodation and vergence when a myopic patient changes from spectacles to contact lenses.

METHODS :

A prospective, non randomized study was carried out in a group of 25 subjects whose average age was of 23.16 ± 4.41 years. It included a group of habitual myopic contact lens wearers and some fresh wearers as well.

All the subjects underwent a thorough optometric examination. Subsequently a full binocular vision evaluation was performed with spectacles and contact lenses on the same day.

Several visual parameters that characterize the accommodative (accommodative amplitude, accommodative stimulus and accommodative facility) and binocular function (stereo acuity, cover test, horizontal dissociated phoria, vertical dissociated phoria, stimulus AC/A ratio, near point of convergence, negative relative accommodation, positive relative accommodation, positive fusional reserve, negative fusional reserve and vergence facility) were measured with myopic spectacles and contact lenses in these subjects.

RESULTS :

The following statistically significant differences were found with the use of spectacles and contact lenses in the accommodative and binocular function: increase in accommodative lag in both the eyes ($p < 0.005$), increase in accommodative facility ($p < 0.005$), objective near point of convergence advancing closer to the eye ($p < 0.005$), increase in negative relative accommodation ($p < 0.005$) and increase in vergence facility ($p < 0.005$) with contact lenses in comparison to the spectacles. No statistical differences were found in other accommodative and convergence parameters.

CONCLUSION :

From results obtained in this study, we can conclude that when one changes from spectacles to contact lenses, there is an increase in demand for accommodation and convergence which is in accordance with the theory that myopes who wear contact lenses accommodate more and converge more than spectacle wearers.

KEY WORDS : Myopia, Contact lenses, Spectacles, Accommodation, Convergence

INTRODUCTION

Theoretically, it has been considered from optical calculations, that myopes, who switch over from spectacles to contact lenses, will accommodate and converge more with the contact lenses as compared to the spectacle lenses. Hence the accommodative and convergence demands will also vary for each myopic subject with respect to the working distance.[1, 2, 3, 4]

In succession to accommodation, there occurs convergence and pupillary constriction of the eyes. A myope wearing contact lenses will converge more with contact lenses as compared to the spectacle lenses. The reason for this is that, when wearing spectacles, the spectacle lenses will behave as a base in relieving prismatic effect, therefore the eyes converge less than the viewing distance would suggest. With contact lenses, there remains a negligible amount of

prismatic effect, thus the convergence demand when switching from spectacles to contact lenses may be clinically significant.[1] This is as presented in figure 1.

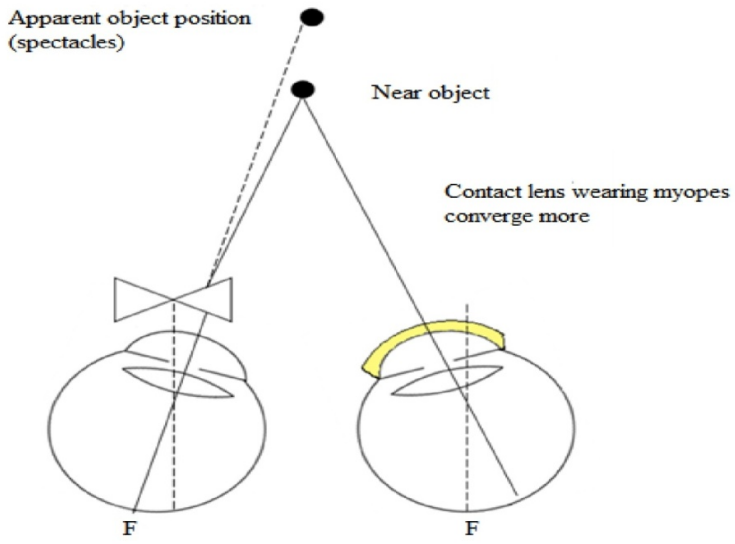


Fig 1 Convergence with spectacles and contact lenses in myopia

With the use of spectacles in myopia, it has been suggested that spectacle wearing myopes will have relatively lesser demands placed on their adduction reserves i.e. their positive fusional vergence demands will be less than the negative fusional vergence demands as compared to contact lenses. When contact lenses are placed on the myopic eye, the positive fusional vergence will increase and the negative vergence will decrease as compared to the spectacle lenses. [1]

AIMS AND OBJECTIVES

The aim of this study was to measure the differences in accommodative, convergence and binocular function in a group of habitual myopic spectacle and contact lens wearers.

This study was conducted to determine whether the measurement of these ocular parameters, would be different in the same subjects when wearing either soft contact lenses spectacle corrections, and to determine whether these values agree to those which would be predicted from optical calculations.

MATERIAL AND METHODS

A Prospective, Non- randomized study of 25 subjects was carried out at Shri C.H. Nagri Municipal Eye Hospital, Ahmedabad. The inclusion criteria were as follows:

Subjects aged between 15 – 35 years, at least - 0.50 Ds of myopia in both principal meridians of both the eyes, an astigmatic ametropia within ≤ 1.00 D, an anisometropia within ≤ 2.00 Ds of range, a stereo acuity of less than 60 seconds of an arch and a visual acuity of 6/9 – 6/6 for distance and a near vision of N6 at 40 cm in both the eyes.

Informed consent was obtained from all the subjects before enrollment. All the 25 subjects underwent a thorough ocular and optometric examination. The following chronologic order was maintained in all subjects. First all subjects underwent a thorough optometric examination and contact lens selection, thereafter an orthoptics and binocular evaluation was

performed with spectacles and contact lenses.

The optometric workup included a proper history taking, sensory and motor evaluation of the eyes comprising of a stereo acuity test, Worth Four Dot Test, cover test for distance and near, visual acuity for distance and near with the Snellen's opto-types, a proper objective retinoscopy in both meridians of the eyes and a subjective refraction. Following this, binocular balancing with the help of the duo chrome test was done to equalize the visual acuity in the two eyes. Optometric examination was followed by a complete ocular examination which included a slit lamp examination, torchlight examination, pupillary evaluation, digital intraocular tension and an undilated direct ophthalmoscopy.

The orthoptics workup included stereo acuity measurements with the help of Random Dot Stereogram (RDS), horizontal and vertical dissociated phoria for distance and near with the help of cover test and Maddox Rod Test, inter pupillary distance and AC/A ratio calculation by the heterophoria method, near point of convergence, near point of accommodation, stimulus to accommodation i.e. MEM dynamic retinoscopy, negative and positive relative accommodation, positive fusional reserve and negative fusional reserve, accommodative and vergence facility.

These same test procedures were repeated with the contact lenses after an adaptation period of fifteen minutes. The soft contact lens fit was evaluated and then the binocular vision was evaluated with the soft contact lenses.

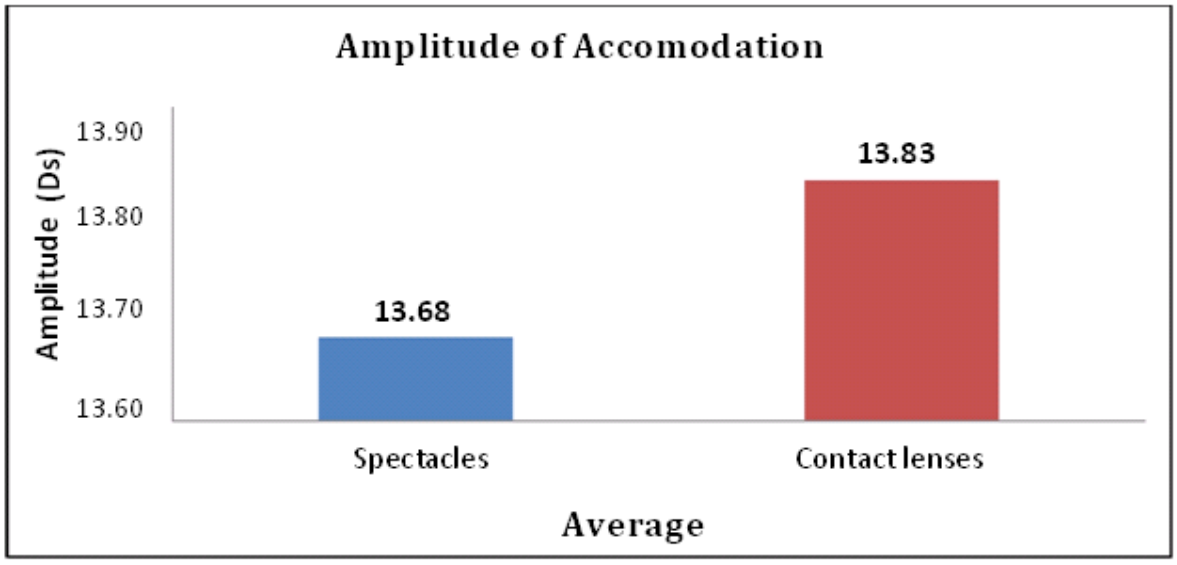
RESULTS :

All the subjects (n = 25) completed the study. The means (and standard deviations - SD) of all the measured parameters were calculated for each correction method, and are given in tables 1 and 2. The values for the parameters in the two groups were then compared using a two paired t-test. There was no statistically significant difference in accommodative amplitude noted. However, a significant difference was noted in the accommodative facility and the accommodative lag with the contact lenses as compared to spectacle lenses.

Parameter	Method		Mean ± SD	Mean ± SD	p value
		Eyes	Spectacles	Contact lenses	
Amplitude (Ds)	Push up technique	OD	13.45 ± 4.05	13.71 ± 4.58	0.57
		OS	14.29 ± 4.94	13.75 ± 5.06	0.26
		OU	13.30 ± 3.79	14.04 ± 5.13	0.20
Facility (cpm)	Flippers ± 2.00 Ds	OD	15.12 ± 5.56	17.22 ± 7.52	p < 0.005
		OS	15.82 ± 5.35	17.68 ± 6.19	0.02
		OU	13.91 ± 5.14	16.80 ± 6.24	p < 0.005
Accommodative Lag (Ds)	M.E.M.	OD	0.78 ± 0.30	1.06 ± 0.28	p < 0.005
		OS	0.89 ± 0.25	1.14 ± 0.27	p < 0.005

TABLE 1 – Accommodative system parameters with spectacles and contact lenses

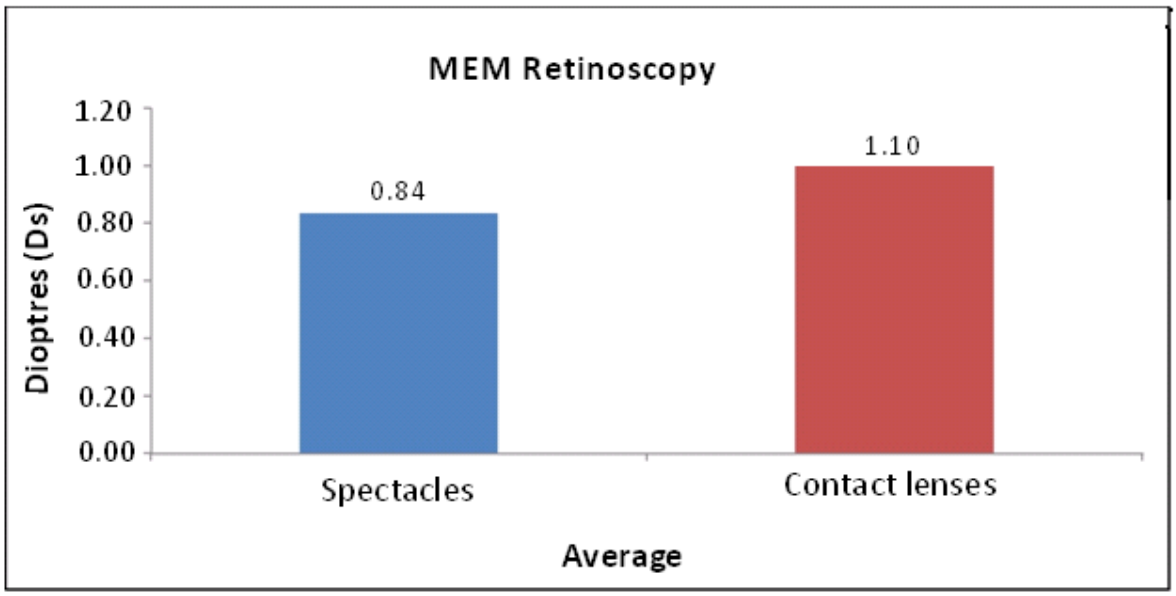
GRAPH 1:



As shown in Graph 1, it can be noted that the average accommodative amplitude increases with contact lenses (13.83 Ds ± 0.18 Ds) as compared to the spectacle lenses (13.68 Ds ± 0.53 Ds).

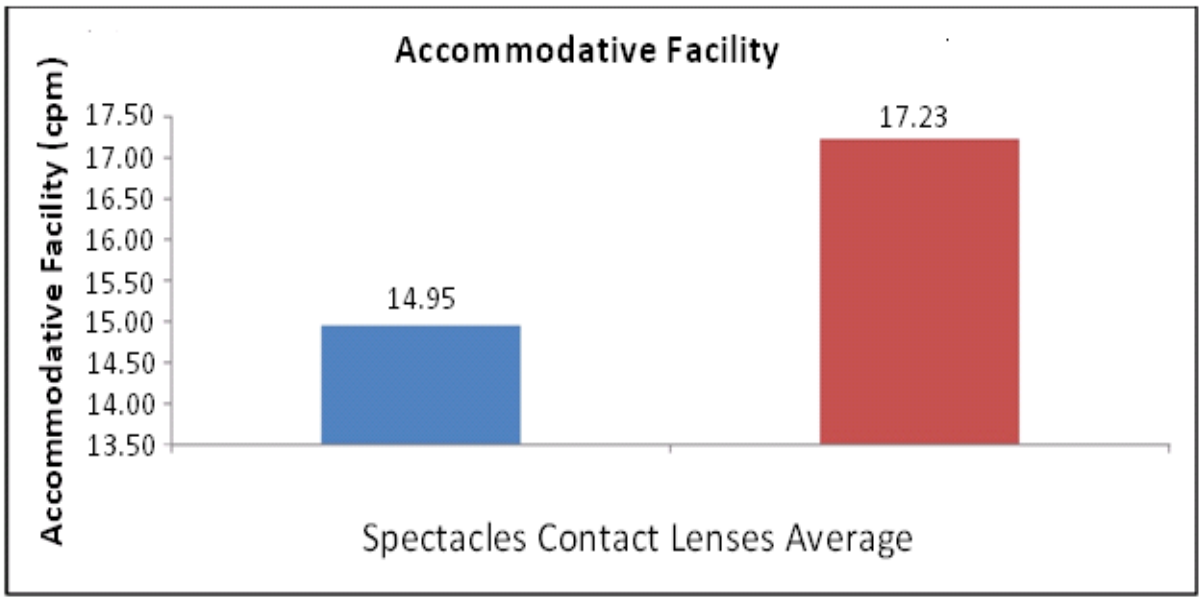
Therefore it can be seen that the average near point of accommodation advances closer to the eye with contact lenses (7.23 cm ± 0.09 cm) in comparison to spectacle lenses (7.32 cm ± 0.28 cm) with no statistical difference in either eye.

GRAPH 2:



The average accommodative response was noted to be higher with contact lenses (1.10 Ds ± 0.06 Ds) as compared to spectacles (0.84 Ds ± 0.08 Ds) from Graph 2. Hence, Graph 2 shows that with contact lenses, there is a lag of accommodation.

GRAPH 3:



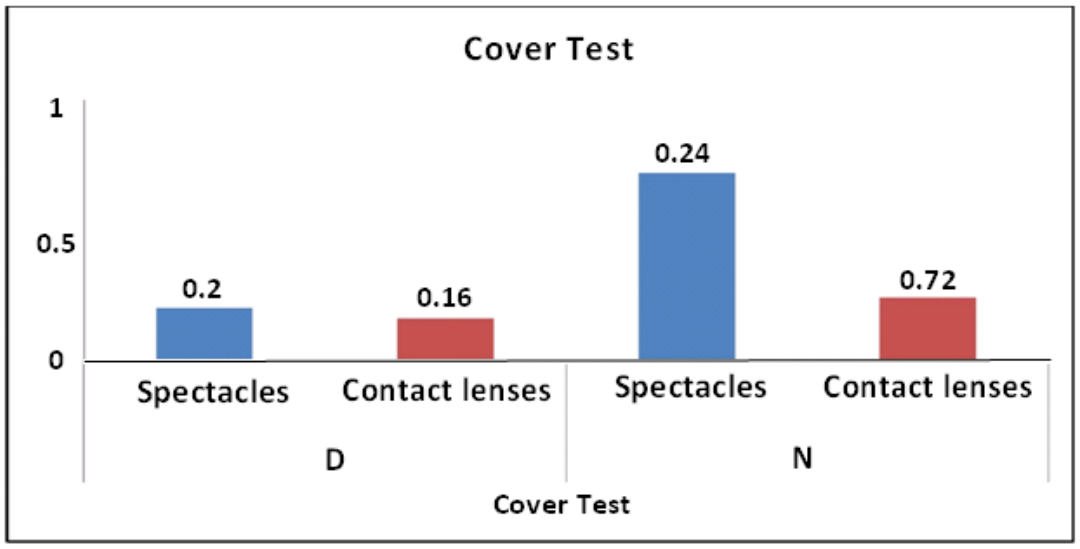
In Graph 3, it can be seen that there is a statistical significant increase in the average accommodative facility when tested with contact lenses (17.23 cpm ± 0.44 cpm) in comparison to the spectacles (14.95 cpm ± 0.97 cpm).

CONVERGENCE:

Parameter	Method	Mean ± SD Spectacles	Mean ± SD Contact lenses	p value
Stereo acuity (seconds of arch)	RDS	40.8 ± 2.77	40 ± 0.00	0.16
Near Point of Convergence (cm)	Objective break	5.92 ± 2.03	5.18 ± 1.66	0.02
	Subjective break	6.60 ± 2.41	6.35 ± 1.86	0.52
	Subjective recovery	8.26 ± 2.45	8.04 ± 2.48	0.62
Horizontal dissociated phoria ( )	Distance	- 0.52 ± 2.16	- 0.28 ± 2.31	0.27
	Near	- 1.58 ± 6.03	- 1.40 ± 6.03	0.34
Vertical dissociated phoria ( )	Distance	0.40 BU ± 0.74	0.36 BU ± 0.74	0.70
	Near	0.36 BU ± 0.80	0.30 BU ± 0.69	0.69
Negative Relative Accommodation (D)	Plus lenses	2.77 ± 0.28	2.92 ± 0.25	p < 0.005
Positive Relative Accommodation (D)	Minus lenses	- 3.14 ± 1.42	- 3.06 ± 1.24	0.57
AC/A Ratio (/ D)	Heterophoria method	5.76 ± 1.70	5.84 ± 1.63	0.44
Negative Fusional Vergence ( )	Blur	4.70 ± 2.79	4.59 ± 2.58	0.81
	Break	11.01 ± 3.17	10.79 ± 3.81	0.74
	Recovery	7.80 ± 5.14	6.82 ± 2.63	0.21
Positive Fusional Vergence ( )	Blur	20.78 ± 14.34	20.85 ± 12.99	0.98
	Break	37.38 ± 12.47	38.28 ± 13.08	0.60
	Recovery	25.40 ± 15.19	25.75 ± 13.60	0.83
Vergence Facility (cpm)	Flippers (12 BO/ 3 BI)	16.13 ± 4.71	18.55 ± 5.53	p < 0.005

TABLE 2 – Convergence system parameters with spectacles and contact lenses

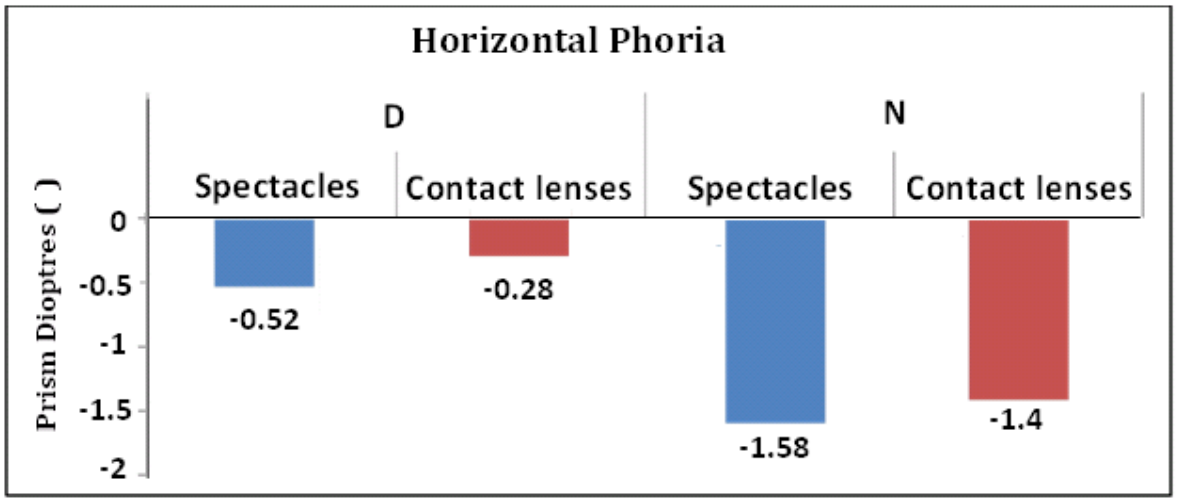
It can be seen from the above table that there is a statistically significant difference in the objective near point of convergence, the negative relative accommodation, and the vergence facility with contact lenses in comparison to the spectacles in the convergence parameters.



GRAPH 4:

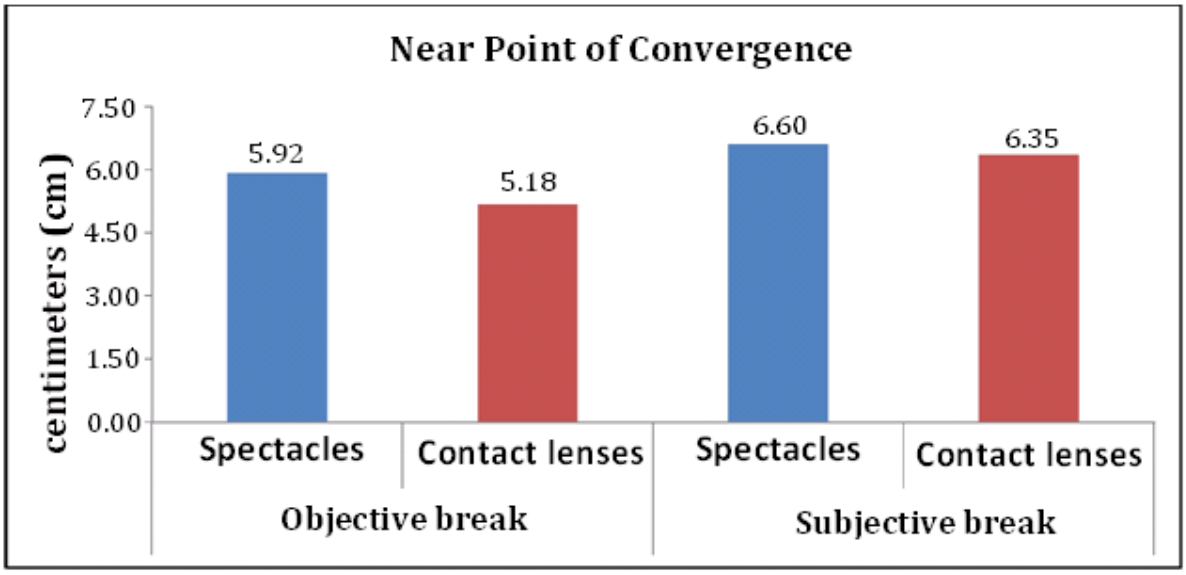
Graph 4 shows the correlationship of the cover test for distance and near. It can be seen that significant phoria which was present for distance has been reduced with the contact lenses. In these cases it was seen that the exophoria was getting reduced with the contact lenses as compared to the spectacles.

GRAPH 5:



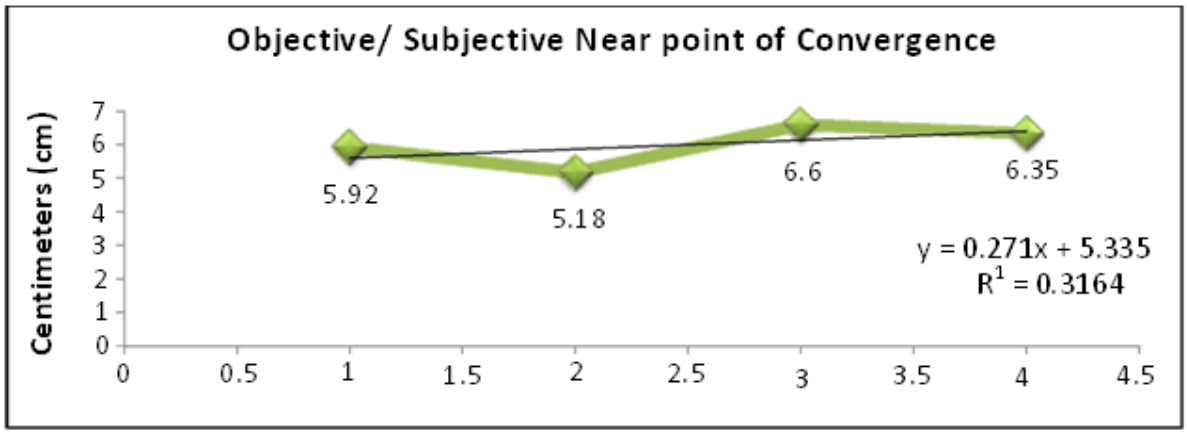
The above Graph 5 shows no significant difference in the phoria values. Horizontal dissociated phoria for distance and near showed less exophoric values with contact lenses (- 0.28 Δ ± 2.31 Δ, -1.40 Δ ± 6.03 Δ) as compared to spectacles (-0.52 Δ ± 2.16 Δ, -1.58 ± 6.03 Δ).

GRAPH 6:



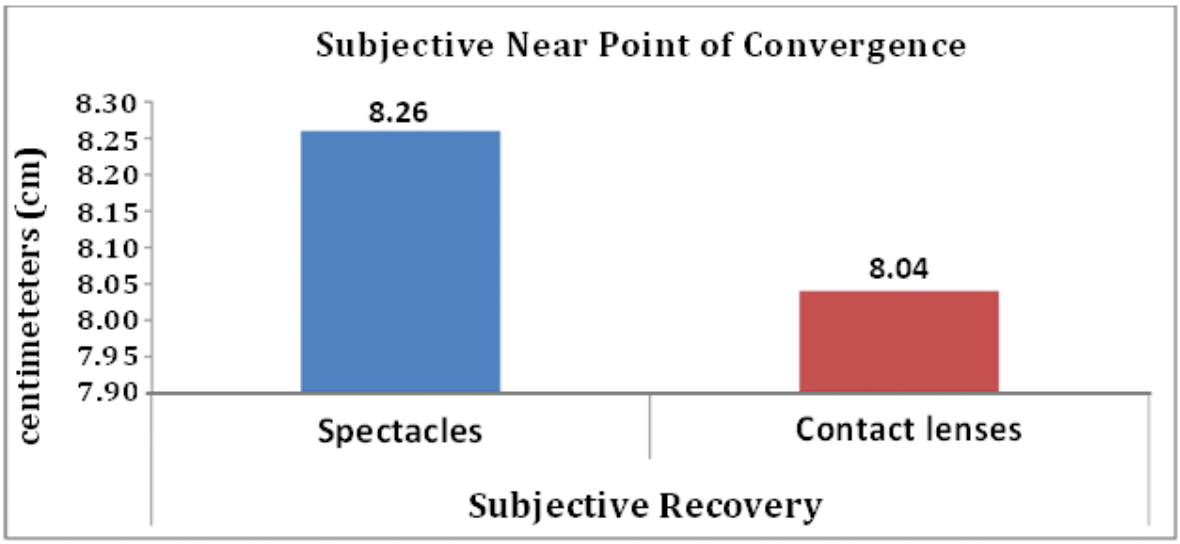
From Graph 6, it can be seen that there is a significant change in the near point of convergence when seen objectively with contact lenses (5.18 cm ± 1.66 cm) as compared to spectacle lenses (5.92 cm ± 2.03 cm).

GRAPH 7:



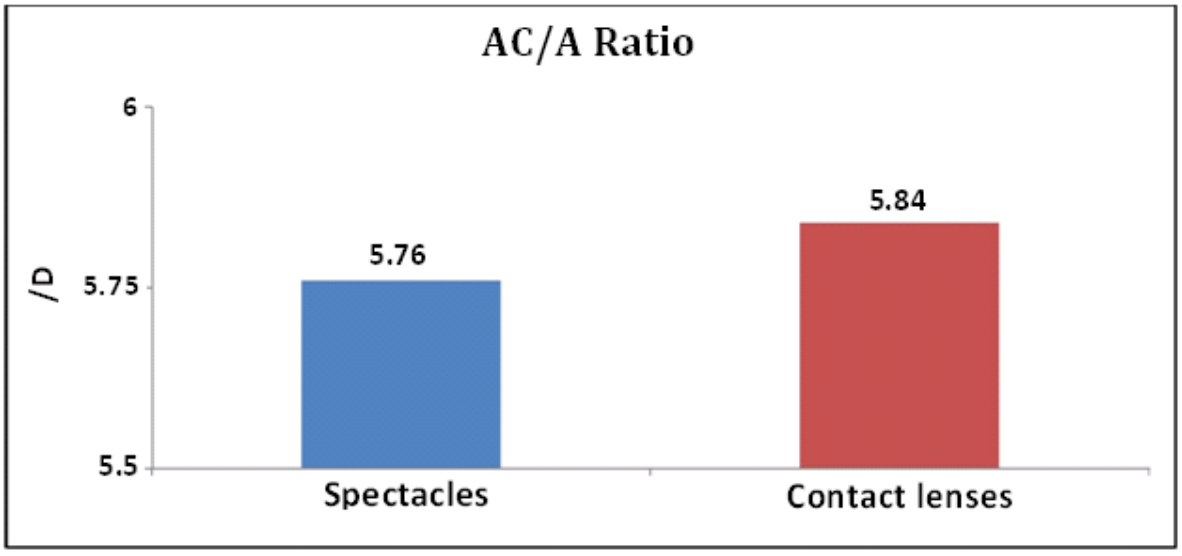
Graph 7 shows the correlation coefficient for the objective and subjective break for near point of convergence which was noted to be 0.32 approximately.

GRAPH 8:



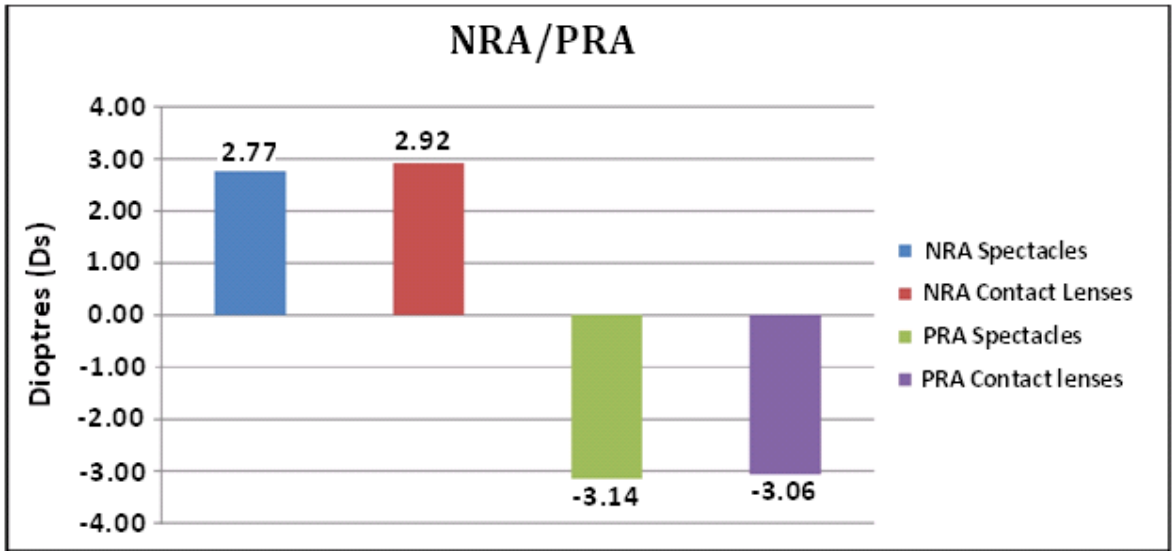
The recovery was noted to be on the lower side (8.04 cm ± 2.48 cm) with contact lenses indicating that the subjects were not able to diverge their eyes as compared to the spectacle lenses (8.26 cm ± 2.45 cm).

GRAPH 9:



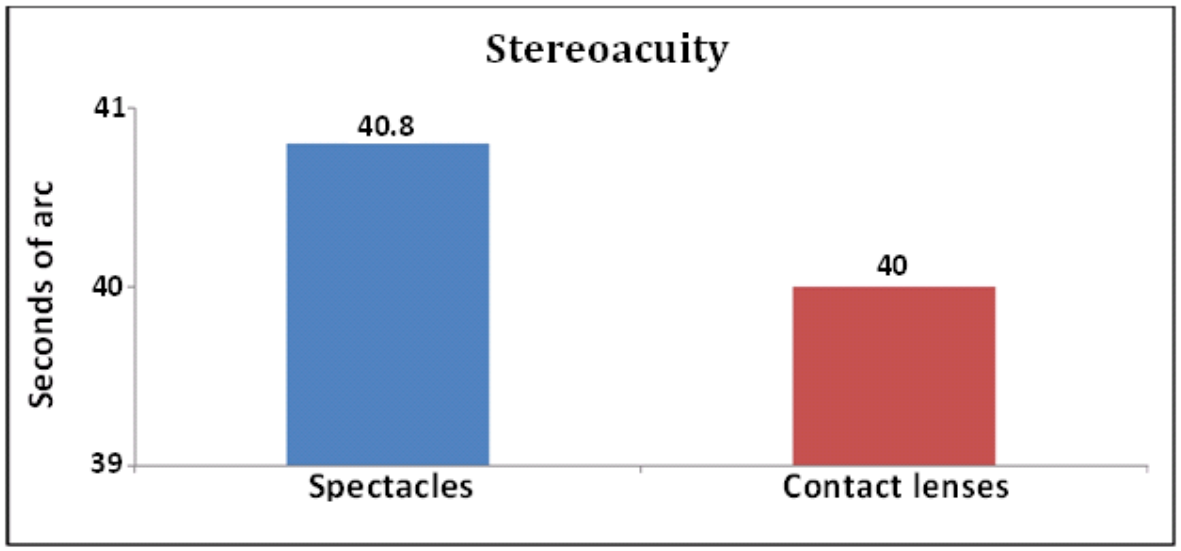
Graph 9 shows the AC/A ratio as calculated by the Heterophoria method, which increases with the contact lenses (5.84 Δ/D ± 1.63 Δ/D) as compared to the spectacles (5.76 Δ/D ± 1.70 Δ/D), but with no statistical difference.

GRAPH 10:



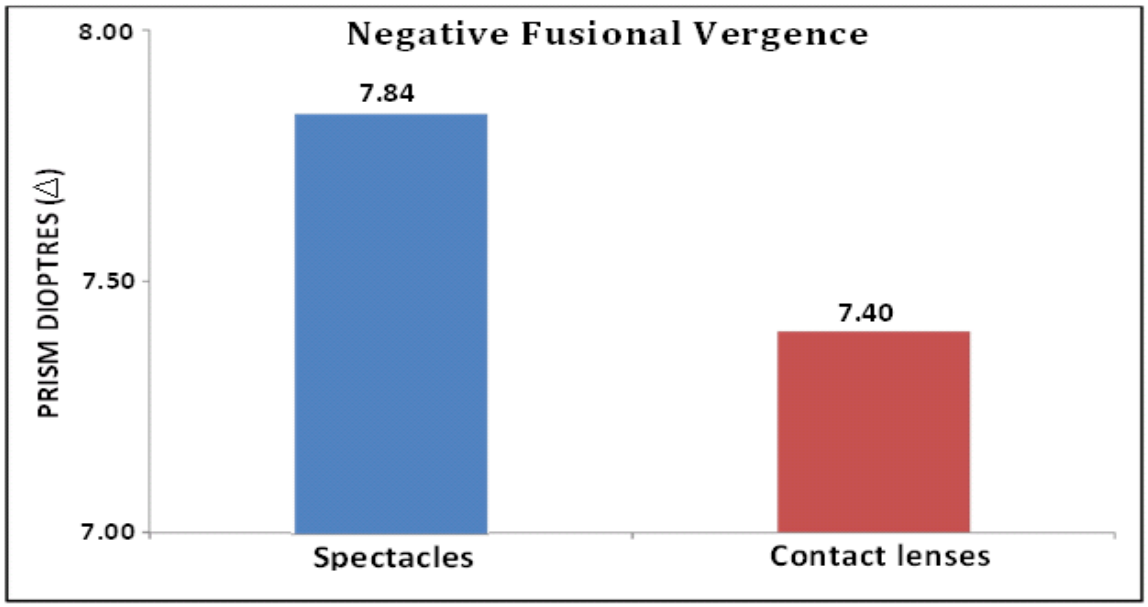
It can be seen from Graph 10 that there is a statistical significant increase in the negative relative accommodation with contact lenses (2.92 Ds ± 0.25 Ds), as compared to the spectacle lenses (2.77 Ds ± 0.28 Ds). The positive relative accommodation value shows a decrease with contact lenses (- 3.06 Ds ± 1.24 Ds) as compared to the spectacles (- 3.14 Ds ± 1.42 Ds) with no statistical difference in the positive relative accommodation value.

GRAPH 11:



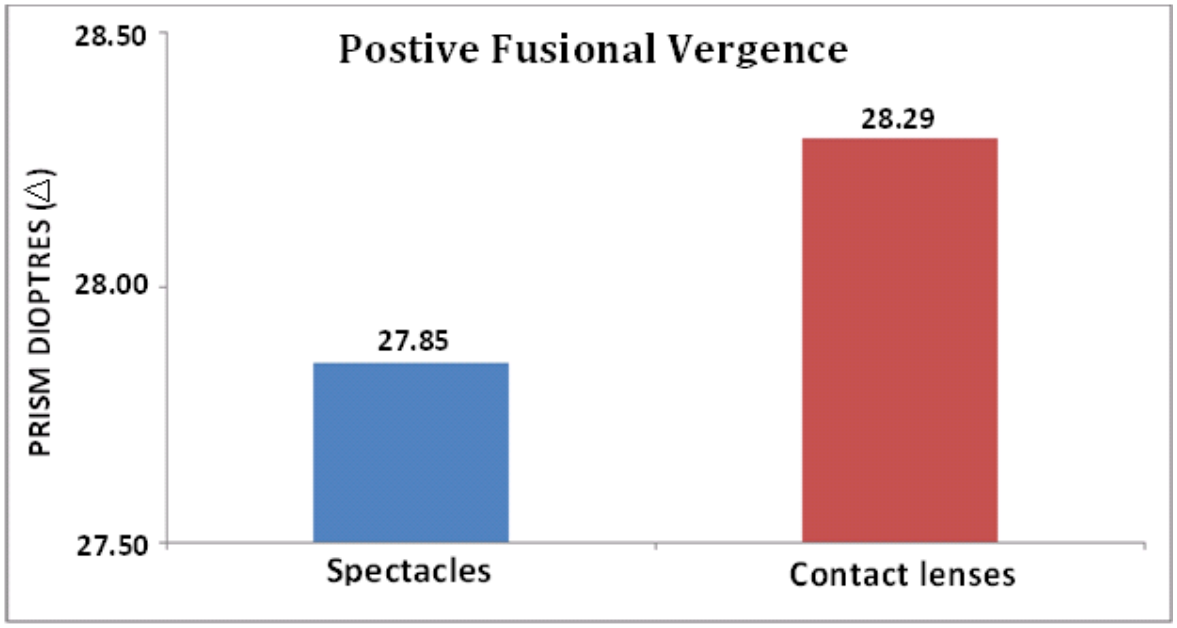
Graph 11 shows that there are no significant changes in the stereo acuity with contact lenses (40' ± 0.00') in comparison to the spectacles (40.80' ± 2.77').

GRAPH 12:



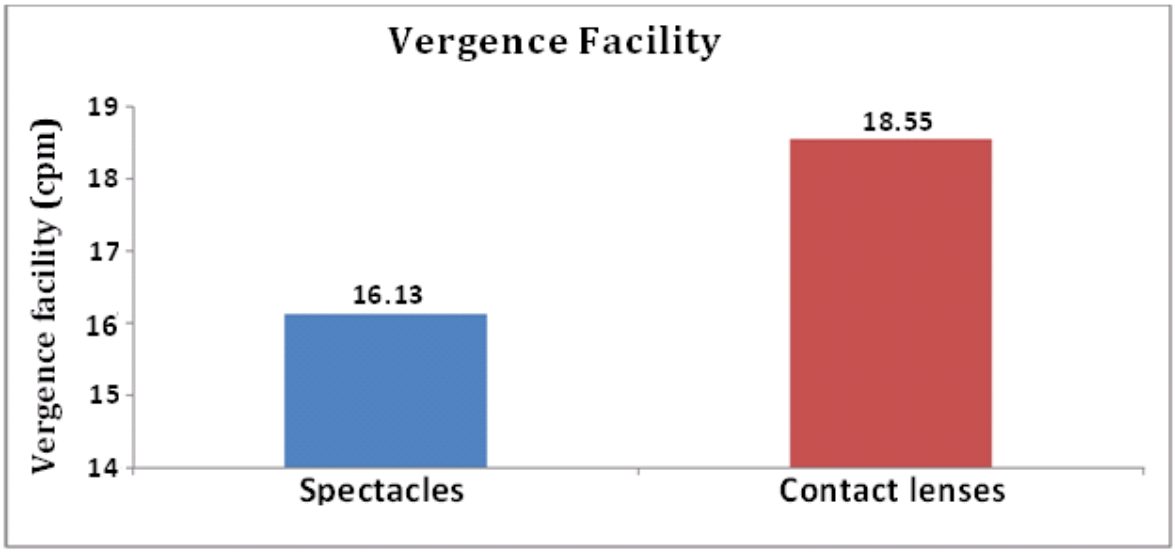
Graph 12 shows that the average negative fusional vergence decreases (7.40 Δ ± 3.14 Δ) with contact lenses as compared to the spectacles (7.84 Δ ± 3.16 Δ), with no statistical significance.

GRAPH 13:



The average positive fusional vergence increases for distance with the contact lenses (28.29 Δ ± 8.99 Δ) as compared to the spectacles (27.85 Δ ± 8.57Δ) with no statistical significance.

GRAPH 14 :



Graph 14 shows that the vergence facility increases with the contact lenses (18.55 cpm ± 5.53 cpm) as compared to the spectacle lenses (16.13 cpm ± 4.71 cpm) and this has a statistical significance also.

DISCUSSION :

As suggested by Fannin and Grosvenor, most contact lens wearers have the refractive errors ranging from ±1.00 D to ± 5.00 D (in our population- - 0.50 D to – 6.00 D), with the result that the change in accommodative convergence is not often a problem.[2,4] However the results found in our study were noted to be significantly different when comparing each of these variables found with contact lenses and spectacles.

Amplitude of Accommodation :

In our study, more accommodation was required by myopes when they changed from spectacles to contact lenses, this may suggest lower accommodative amplitudes with the spectacles. According to a study done by Carney (1977), to compare the accommodation with rigid and flexible contact lenses, both forms of contact lenses placed greater accommodative requirements on the myope than did the spectacle correction, but no significant difference was found between the two types of contact lenses in this respect.[8] In our study, the amplitude of accommodation was found to be increased with contact lenses although there was no statistical significance.

The short period of soft contact lens wearing in our study did not allow the adaptational changes in accommodative amplitude, therefore if contact lenses were used for several hours or days before taking the measurements, the results might be different as suggested by Raimundo et. al.[7]

Lag of Accommodation :

In our study the values for lag of accommodation were noted to be quite different. We

saw that as the accommodative amplitude increases, there is an increase in the lag of accommodation. However as suggested by Schor et. al.[9], as the amplitude of accommodation increases, the lag of accommodation may decrease due to the factor of tonic accommodation in darkness . These higher lag values could be an early sign of reduction in the amplitude of accommodation when soft contact lens are used for longer periods of time. As proposed by Goss and Zhai, an individual who does a great deal of near work, and whose accommodation lags more than normal, is prone to develop or to progress in myopia. [10]

Accommodative facility :

As suggested by Radha Krishnan, subjective and objective facility measurements showed a significantly lower facility rate in contact lens corrected myopes when compared with emmetropes at distance, but not at near. For near facility measurements, however, although velocity of relaxing accommodation was lower in myopes, velocity of accommodation was found to be similar in the two refractive groups.[11] This suggests that the facility rate will be equal with both contact lenses and spectacles. In the study by Raimundo et al, they found the values of accommodative facility were noted to be lower with contact lenses with no statistical significance.[7]

In our study, the accommodative facility showed a statistical significance. It increased with contact lenses, the possible reason for that may be the subjects were able to learn the test quickly and the test procedure was done on the same day.

Horizontal Phoria Status and AC/A Ratio :

In myopic subjects, because the optical stimulus for accommodation is greater with contact lenses, thus increasing the synkinetic function of accommodative convergence, one would expect that the near horizontal phoria would be more towards esophoria with contact lenses than with spectacles. If the wearer happens to be exophoric, the increase in the amount of accommodative convergence will result in a decreased exophoria and thus reduce the need for positive fusional vergence.[4, 12] Therefore the AC/A ratio also should increase.

As Westheimer and Stone suggested, the AC/A ratio also tended to remain the same with contact lenses and spectacles.[13, 14] In our study there was no relative difference in the AC/A ratio between the two correction methods although it was slightly on the higher side as suggested by Ogle.[12] The results in our study show that there is a reduction in the exophoria with near with contact lenses than spectacles which proves the same and a not very significant change in the AC/ A ratio.

Near Point of Convergence :

As stated by Raimundo et al, subjective break of near point of convergence and recovery did not vary significantly. [7] In our study we found though the subjective near point of convergence did not vary, the objective near point of convergence showed some variations. In all cases it was noted to be advancing towards the eyes with contact lenses than spectacles with a statistical significance.

Relative Accommodation and Fusional Vergences :

According to Raimundo, in his study, the NRA and PRA values were significantly different with contact lenses as compared to spectacles and this may be related more to the accommodative function than the binocular function.[7]

In our study the NRA was found to be lower with contact lenses. This would suggest that as the accommodative convergence decreases, there is divergence of the two eyes resulting in diplopia. To counteract this diplopia and to maintain binocular single vision at near, the subject must use the positive fusional reserve. With contact lenses, this prismatic effect is absent; therefore the NRA will be increased with contact lenses. Subsequently the PFV also should decrease and the NFV would increase to maintain the balance of the two eyes. [7] Even though, the values of NFV and PFV are not statistically significant, they may be significant from a clinical standpoint for this study. According to another study Gwaizda et. al and Goss et. al, the PRA was found to be noted lower in myopes who wore spectacles.[15, 16] In our study it was noted to be on the lower side than expected with contact lenses with no statistical significance.

Vergence Facility :

The vergence facility with contact lenses was noted to increase although there was no statistical significance as stated by Raimundo et. al.[7] In our study the vergence facility was noted to increase for the reason that patients were able to sustain the vergence dynamics and this may be due to learning of the test procedure itself.

Relation to Age and Presbyopia :

As the age increases, it can be assumed that a 4.00 Ds hyperopic presbyope who is wearing spectacles will require an add at an earlier age than a myope who wears spectacle lenses due to increase in the accommodative demand. If this same spectacle wearer shifts to contact lenses, the accommodative demand will decrease in cases of hyperopia and increase in cases of myopia. The newly presbyopic myope has to accommodate more with contact lenses as compared to the spectacles; hence it can hasten the progression of presbyopia. [2]

LIMITATIONS :

The limitations for this study are as follows: The test procedures were performed on the same day due to the lack of time provided by the subjects. No cycloplegic refraction was done although detailed care was being taken by performing fogging procedure. Hyperopes were not included for this study.

CONCLUSION :

From this study we can conclude, that there are some significant changes in the accommodative and vergence parameters when a myope who is wearing spectacles shifts to contact lenses. It can be concluded that myopes need to accommodate more and converge more with contact lenses as compared to spectacles and one factor is accommodative

convergence which needs to be taken into due consideration while dispensing a contact lens to a myopic patient.

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(7) EEEFCT OF BODY FAT PERCENTAGE ON PEAK EXPIRATORY FLOW RATE (PEFR) IN YOUNG ADULTS OF INDIAN POPULATION

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ABSTRACT

BACKGROUND : Obesity impairs quality of life by causing various hazardous effects on respiratory functions of an individual along with other medical complications

OBJECTIVES :. The objective of the study was to evaluate effect of body fat percentage on PEFR in young adults of Indian population.120 students of 18-25 years age group who had no lung disease were recruited. Their age, sex, height, weight were recorded and BMI was calculated.. Accordingly 60 students with BMI 25.0 - 29.9 kg/m^2constituted study group and 60 students with BMI 18.5- 24.9 kg/m^2 constituted control group. Skinfold thickness was calculated using 4-site method (biceps, triceps, subscapular and suprailiac) with the help of Skinfold Caliper. Body fat percentage was calculated by using Durnin and Womersley method.

METHODS : PEFR was recorded by computerised spirometry. The statistical analysis was done using appropriate tests.

CONCLUSION : The study group presented with lower values of PEFR than control group. Moreover PEFR was having strong negative correlation with body fat percentage. The effect of body fat percentage on PEFR indicates that independently obesity affects expiratory flow volume and pulmonary mechanics of an individual.

KEY WORDS : - Body fat percentage, Spirometry, Durnin and Womersley method, PEFR (Peak Expiratory Flow Rate)

INTRODUCTION

In the present era of modernization and globalization, developing countries like India is facing obesity as important health problem. Besides the genetic predisposition, adoption of sedentary lifestyle, lack of regular physical exercise, excessive intake of junk foods, stress of

competitive world has made the environment conducive to the development of obesity [1]. Most popular index to compare body composition of people and to categorize them as obese and non-obese is the Body mass index (BMI). Although BMI is the major index in evaluating obesity but direct measurement of body fat and its distribution is more important [2]. Moreover the effects of obesity on ventilatory parameters may depend on both the distribution and size of excess adipose tissue [3].The deleterious effects of obesity on pulmonary functions led to various complications. Different expiratory flow rates are employed to demonstrate the narrowing of airways. Peak expiratory flow rate (PEFR) is a convenient tool to measure lung functions in a field study [1, 4]. It is the maximum velocity of flow with which air is forced out of the lungs. This maximum rate is recorded during procedure of rapid and forceful expiration after deep inspiration without stopping for at least 6 seconds. It is a fairly good indicator of bronchial hyperresponsiveness[1,5]. The current study looks into the association of body fat percentage with PEFR in normal weight and overweight M.B.B.S. students. So that the subjects who are at high risk can be identified. This will help to plan and execute preventive measures to prevent negative effects on health and quality of life. Overall the study depicts effect of obesity on pulmonary mechanics of an individual.

MATERIALS AND METHODS

The present study was undertaken in young adults of 18- 25 years medical undergraduate students from a well known tertiary hospital Mumbai. The proforma and plan of the study were submitted to the local Ethics Committee and were approved before undertaking this study. The plan and purpose of study were explained to students. Then every student signed informed consent. 120 medical undergraduate students of age 18-25 years including both males and females participated in this study. All students were normal without any symptoms. Participants with known history of any respiratory disease, heart disease or major surgery done, any neuromuscular disorder or skeletal muscle abnormalities were excluded.

The study was conducted using equipments: weighing machine, measuring tape, Skinfold Caliper and computerized PFT machine. Age (years), sex and anthropometric parameters (height (cm) and weight (kg) were noted. Weight was measured using a weighing machine whose least count was 0.5 kg. Height was measured using a measuring scale whose least count was 0.1cm. BMI was then calculated using Quetlet's index as:

BMI = weight (kg) / Height (metre) ^{2}

Participants were classified depending upon BMI as :

Control Group : 18.5 – 24.9 kg/m^2 and Study group : 25.0 – 29.9 kg/m^2

In both groups each constituted 60 students having 30 males and 30 females in that individual group. Skinfold measurement method was most widely used body composition testing method for assessing percent body fat. Skinfold parameters measured were biceps (mm), triceps (mm), subscapular (mm) and suprailiac (mm). All these parameters were measured using skinfold caliper (make Anand Agencies) whose least count is 0.1mm. Skinfold caliper is a device which measures skinfold thickness with underlying layer of fat. All measurements were taken on right side of body while standing erect. The participants were

instructed to keep shoulder and arm muscles relaxed during the test. All measurements were done on healthy, undamaged, uninfected dry skin. The skinfolds were picked up between the thumb and index finger of left hand and lifted up. The caliper was held in right hand and pressure plates were applied perpendicularly 1 cm above the fingers holding the skinfold tightly and allowing the pressure of the caliper alone to be applied to the skinfold. The reading was taken 2 seconds after the caliper application in mm. The grip was maintained throughout the measurement. Minimum of three measurements were taken at each site with atleast 2 min interval to allow the tissue to restore to its uncompressed form. Midpoint between tip of acromion process and tip of olecranon process keeping elbow in extended and relaxed position was identified using a measuring tape. At this midpoint vertical fold was raised on anterior aspect of arm for biceps skinfold. For triceps skinfold procedure is same except fold was raised on posterior aspect of arm. Subscapular skinfold measurement was taken on the oblique fold just below the bottom tip of scapula. Suprailiac skinfold measurement was taken on slightly oblique fold just above the crest of ileum in the midaxillary line just towards front from side of waist. The average of three readings at a particular site represented the accepted value for that site.The sum of accepted values at all four sites represented the final skinfold score which was entered into a table given by Durnin and Womersley for calculating body fat percent [6].

The evaluation of peak expiratory flow rate was performed by computerized PFT machine manufactured by MEDGRAFICS (CPFS/D USB Med Graphics preVent ™ Pneumotach). The participant was asked to sit comfortably in a chair. Each participant had been explained about the test in detail. They were also shown how to perform the test with sufficient trials. Peak expiratory flow rate (PEFR) or Forced expiratory flow at maximum effort (FEF_{max}) is the maximum flow rate attained during FVC maneuver. For recording Forced vital capacity (FVC), the participant was asked to inhale deeply and then exhale to the extreme rapidly and forcefully for minimum 6 seconds without stopping. Three efforts were done and the best effort was taken into consideration according to standard norms [7]. Maximum flow rate in this procedure was recorded. The readings for PEFR were expressed as L/min. The results were tabulated. The data entry was done in MS-EXCEL programme and analysis was done by SPSS-IS statistical software version 19.0 for windows. For statistical analysis, the data were submitted to unpaired‘t’ test. So that comparison of PEFR in study and control group was obtained. For finding correlation between body fat percentage and PEFR, Pearson’s correlation test was applied.

RESULTS

TABLE 1: COMPARISON OF ANTHROPOMETRIC PARAMETERS, BODY FAT PERCENTAGE AND PEFR IN CONTROL (NORMAL WEIGHT) AND STUDY (OVERWEIGHT) GROUP

Parameter	Males		Females	
	Control	Study	Control	Study
Age (years)	19.80 ± 1.79	20.17 ± 1.90	19.37 ± 1.00	19.43 ± 1.30
Height (cm)	170 ± 7.43	163 ± 8.44	159 ± 6.95	158 ± 5.07
Weight (kg)	61.60 ± 6.71	70.72 ± 8.41	53.30 ± 6.65	66.40 ± 5.31

BMI (kg/m^2)	22.52 ± 1.95	26.52 ± 1.09	22.02 ± 1.89	26.18 ± 0.74
Skinfoldthickness (mm)				
Biceps	9.77 ± 1.17	11.30 ± 2.00	13.10 ± 2.09	19.53 ± 1.50
Triceps	11.23 ± 1.55	15.50 ± 2.10	14.30 ± 2.29	21.60 ± 1.60
Subscapular	11.20 ± 1.32	15.57 ± 2.50	16.37 ± 4.41	23.17 ± 2.20
Suprailiac	12.30 ± 1.84	17.30 ± 2.58	17.37 ± 4.60	24.67 ± 3.47
Body fat%	17.43 ± 1.21	21.42 ± 1.70	29.08 ± 3.03	34.40 ± 3.05
PEFR (L/min)	464 ± 23.92	381 ± 12.81	328 ± 10.11	272 ± 20.56

Mean ± SD, $p<0.05$ unpaired 't' test, BMI- Body Mass Index, PEFR-Peak Expiratory Flow Rate

Table 1 shows comparison of various parameters between study (overweight) and control (normalweight) group. In this study, parameters age and height were not having much difference. But their weight and BMI were statistically different. The values of skinfold thickness (mm) at mentioned 4-sites along with body fat% were significantly higher in overweight adults than normal weight. As far as expiratory flow rates are considered, PEFR is lower in study group than control group. In females all anthropometric parameters including BMI, Skinfold thickness and body fat% were higher than their male counterparts. But PEFR values were lower in females. It was observed that body fat % was having strong negative correlation with PEFR in both males and females with Pearson's correlation values : males (r= **-** 0.72) and females (r = **-** 0.61). Figure 1 and Figure 2 depict scatter plot diagram showing correlation of body fat percentage with PEFR in females and males respectively. Table 2 gives more details of this correlation.

TABLE 2 : CORRELATION OF BODY FAT % WITH PEFR IN MALES AND FEMALES

Body fat percentage		**PFT-PEFR**
Female (60)	Pearson Correlation	-0.611
	Sig. (2-tailed)	2.16E-07
	N	Significant
Male (60)	Pearson Correlation	-0.721
	Sig. (2-tailed)	7.96E-11
	N	Significant

FIGURE 1: SCATTER PLOT SHOWING CORRELATION OF BODY FAT % WITH PEFR IN FEMALES

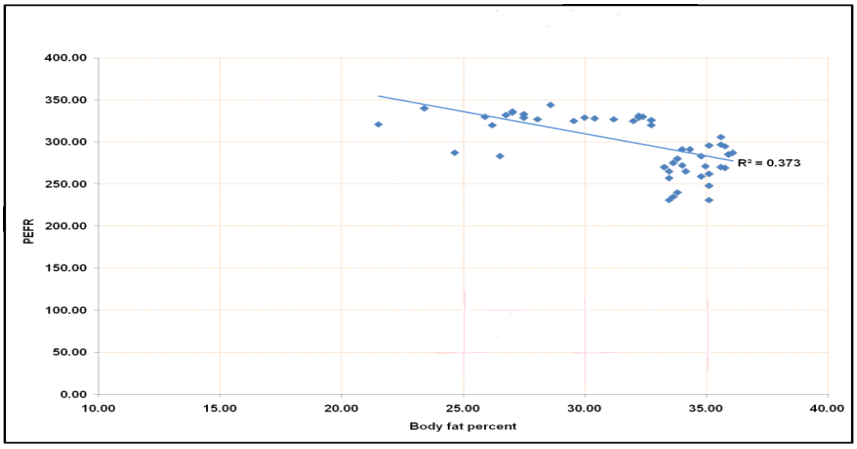
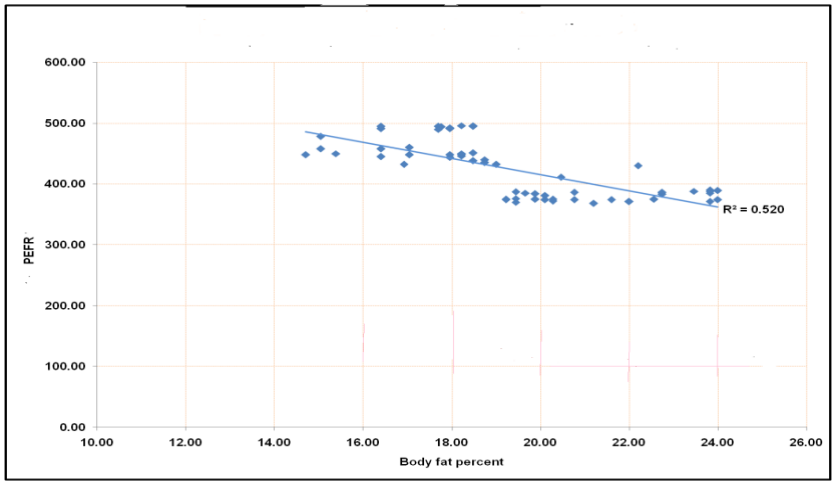


FIGURE 2: SCATTER PLOT SHOWING CORRELATION OF BODY FAT % WITH PEFR IN MALES.



DISCUSSION

Quantitative distribution of body mass provides the initial framework for the description of man's nutritional status [8].The fat content of the human body influences morbidity and mortality of individuals. PEFR is a fairly good indicator of bronchial hyperresponsiveness[1,5] and does not require body temperature pressure saturated (BTPS) correction. The PEFR values are affected by various factors, such as sex, body surface area, obesity, physical activity, posture, environment and racial differences [1, 9, 10, 11]. The primary factors that affect PEFR are strength of the respiratory muscles, respiratory compliance and the airway size. Obesity is characterized by combination of effects on lung and chest wall compliance [12,13].Lung compliance is decreased due to reduced distensibility of extra

pulmonary structures, increased pulmonary blood volume, closure of dependent airways and increased alveolar surface tension [12,13,14] .The increased adiposity around ribs, diaphragm and abdomen leading to limited movement of ribs as well as decreased total thoracic and pulmonary volume pulling chest wall below its testing level cause reduction in chest wall compliance[15].

The impaired respiratory muscle function has been possibly related to fatty deposits, overstretched diaphragm, decreased isokinetic skeletal muscle endurance [16,17,18.19,20,21 22]. Decreased respiratory compliance, Intrinsic structural changes, thickening of airway wall combinely contribute to airflow limitation resulting in lower PEFR in obesity[19,23]. Lipid deposition, cellular hyperplasia and alveolar enlargement are seen in immature obese rats as studied by Inselman et al in 2004[24, 25]. Obesity is associated with adipokines causing systemic inflammation are associated with impaired lung function [26, 27, 28, 29, 30]. Although many studies regarding effect of obesity on pulmonary functions have been done from time to time, still we have not succeeded in bringing about curative measures. So the main importance now lies in identifying subjects at risk as means of preventive measures. The findings of our study indicate that measure of body fat percentage affects expiratory flow volumes which are evidenced by changes in PEFR in overweight adults. These findings suggest that obesity causes deleterious effects on pulmonary mechanics.

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(8) STRESS AUDIT OF STUDENTS OF DIFFERENT MEDICAL COLLEGES

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ABSTRACT :

INTRODUCTION : Since Hans Seyle first described stress, physicians and scientists have been studying stress and various manifestations of it. In pursuit of happiness, man has tried to eliminate stress from his life, but in vain!!

MATERIAL AND METHODS : Based on symptoms and signs of stress, we devised a questionnaire to assess stress levels in participants. In present study we carried out stress audit of students of 1 MBBS (225 students) of a government medical college, located in a metropolitan city and 1 MBBS (150 students) of a government medical college located in a small city.

RESULTS : Comparative study of these gen y persons of a metropolis and a small city was done. It was found that metro medical students had higher stress levels.

KEY WORDS : Stress, Stress Audit, Stress Relief, Yog, metropolis.

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INTRODUCTION

Stress is known to human being in different ways. Stress is defined as the feeling of being worried because of difficulties in ones life. (3). Stress is a state of mental or emotional strain. (4).

Stress in Physiology, is a state of physical, mental or emotional disturbance, in homeostasis. (1). Generally level of cortisol in blood is controlled by negative feed back mechanism or circadian rhythm. However plasma cortisol level rises sharply during stress and overcomes negative feed back mechanism. (2). Some persons respond more violently to stressors than others.

MATERIAL AND METHODS

The study was carried out at Metropolitan Medical College, Ahmedabad and City Medical College. (in short Metro College and City College).

We made a questionnaire and asked the young students of I MBBS to reply the same. Their answers formed the basis of stress audit, we carried out. Students were taught about homeostasis and stress, as part of their syllabus. Prevalence of stress, methods of audit and the purpose, were explained to the students.

Frequency of getting angry, feeling tired, having quarrels, getting bored, losing belongings and eagerness to learn new skills: were accessed on grades 0 – 6. Stress related symptoms during examinations, prevalence of psycho somatic diseases in the family and death due to stress related events; each positive response was given score of 2. 'At ease with self ' activities were given negative rating of -2 each. (Thus the highest score was $6 \times 6 + 8 \times 3 - 2 \times 0 = 60$.)

Data were entered in excel sheet and standard methods of statistics were used. The range of stress score was from -8 to +60.

The scores of more than 30 and less than 0, were considered extremes on higher and lower sides of the score. Since these scores were seen in a very few persons, these were excluded from the present study. Participants were divided into having scores of 0 – 6 (lower score = no stress), 8 – 14(lower average = minimum stress), 16 – 22 (higher average = borderline stress) and 24 – 30(higher score = more stress, in need of help).

RESULTS

Students of metro medical college had stress score of 13.19 compared to 12.49 of city medical college. Girls of metro medical college had significantly high stress score (14.10) compared to (11.29) of girls of city medical college. (Table 1)

Table 1 : Gender and stress score

Gender	MBBS 1 metro MC	MBBS 1 City M C
Male no(%) st score	146 (065%) 12.86	088 (059%) 13.34
Female no(%) stress	079 (035%) 14.10	062 (041%) 11.29
Total no(%) stress	225 (100%) 13.19	150 (100%) 12.49

Students having highest and lowest score, in percentage terms were double in city medical college. (Table 2)

Table 2 : Place of study and stress score

Stress score	MBBS 1 metro MC	MBBS 1 City M C
Group Average	13.19	12.49
Highest Score	30 03 (01%)	30 03 (02%)
Lowest Score	00 03 (01%)	00 03 (02%)

Among different headings of stress score, metro medical students had higher stress scores on sub headings viz. getting tired, learning new skills, forgetfulness and psycho somatic disease in family. City medical college students scored high on anger, quarrel, boredom, exam related stress, stress relief activities and family-member's death due to psycho somatic ailments. (Table 3)

Table 3 : Different and total stress score, in different cities

Different scores	MBBS 1 metro MC	MBBS 1 City M C
Anger score	01.97	**02.07**
Tiredness score	**02.84**	02.28
Quarrel score	02.23	**02.47**
Boredom score	01.51	**01.53**
Skill set learn sc	**01.52**	00.84
Forgetfulness sc	**02.38**	**02.24**
Exam symptoms	01.42	**01.68**
Family Disease	**01.57**	01.40

Family Death	00.64	**00.81**
At Ease Activity	-02.90	**- 02.83**
Total strs score	**13.19**	12.49

(Dark figures show highest score, amongst different groups under study.)

Score range 08 – 14, was seen in 46 – 52 % of participants. This perhaps is the optimum score, viz. eu stress, which gives highest work efficiency. In the dis stress / de stress range of score 24 – 30, we had 07 – 09 % of participants in both the colleges. (Table 4)

Table 4 : Stress score as per gender and city.

stress score	*MBBS 1 metro total*	*MBBS 1 city total*
00 – 06	038(17%)	027(18%)
08 – 14	104(46%)	078(52%)
16 - 22	068(30%)	032(21%)
24 – 30	015(07%)	013(09%)
No (100%)	225	150
avg score	**13.19**	12.49

23% of city college girls, highest in the subgroups, occupied birth of stress score range 0 – 6(lower score = no stress). 42 – 52 % of youth had stress range 8 – 14(lower average = minimum stress). 17% of city college boys, lowest in the subgroups, had stress score range 16 – 22(higher average = borderline stress). City college girls had lowest stress score of 11.29, whereas metro college girls had highest stress score of 14.10, among the subgroups studied. (Table 5)

Table 5 : Stress levels as per gender and city.

stress score	*MBBS 1 metro male*	*MBBS 1 city male*	*MBBS 1 metro female*	*MBBS 1 city female*
00 – 06	27 (19%)	13 (15%)	11 (14%)	14 (23%)
08 – 14	71 (49%)	47 (53%)	33 (42%)	31 (50%)
16 - 22	40 (27%)	15 (17%)	28 (35%)	17 (27%)
24 – 30	08 (05%)	13 (15%)	07 (09%)	00
No (100%)	146	88	79	62
avg score	12.86	13.34	14.10	11.29

DISCUSSION

Metro college students had higher stress score, compared to city college students. Metro college girls had highest stress score, amongst boys and girls of metro and city medical college.

Around 30 – 37 % students had stress higher than 16 and they needed training in de stress measures. The students were given guidance about various de stress measures.

CONCLUSION

Medical students at metro medical college had higher stress than other students. This may be reflecting the life at megapolis and loneliness, in the ocean of people.

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(9) ROLE OF TRANEXAMIC ACID FOR REDUCING BLOOD LOSS IN TETRALOGY OF FALLOT

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BACKGROUND: Antifibrinolytic agents are used to reduce post-operative blood loss during cardiac surgeries. Paucity of literature on tranexamic acid in patients undergoing tetralogy of fallot repair encouraged us for this study at a tertiary cardiac care center. Administration of antifibrinolytic agent tranexamic acid decreases bleeding and transfusions during post-operative period.

METHODS : Sixty pediatric patients undergoing surgical repair for tetralogy of fallot were divided into two groups. The control (Group-A) did not receive the drug while the study group (Group-B) received IV tranexamic acid at pre-incision, during priming and heparin reversal at 10 mg/kg. Blood loss, need for supplementation of blood and blood products, coagulation parameters and re-exploration rate were compared between the groups.

RESULTS : Both groups had comparable demographic parameters (age, weight, and body surface area and tetralogy of fallot characteristics). Tranexamic acid treated patients experienced lesser blood loss ($p<0.0003$), need for PCV ($p<0.0001$) or Fresh Frozen Plasma (FFP; $p<0.0001$). Improved coagulation parameters [increased Fibrinogen content ($p<0.01$) and platelets ($p<0.01$); decreased activated clotting time ($p<0.01$) and fibrin degradation product ($p<0.01$) were also seen in drug treated patients.

CONCLUSION: Tranexamic acid was effective in reducing post-operative blood loss with improved coagulation parameters. We therefore advocate its routine use for tetralogy of fallot repair surgeries in pediatric patients.

KEYWORDS: Tetralogy of Fallot, Congenital Heart Diseases, Cardio Pulmonary Bypass, Ventricular Septal Defect.

INTRODUCTION:

Children with congenital cyanotic heart diseases undergoing corrective cardiac surgery are normally at high risk of excessive post-operative bleeding. Surgical correction of Tetralogy of Fallot consist of Ventricular Septal Defect (VSD) closure and right ventricular infundibular resection, so that all the blood from right ventricle can be pumped into pulmonary artery.

Risk of excessive bleeding during and after cardiac procedure is due to hematological abnormalities like Polycythemia, Thrombocytopenia, Thrombocytopathy, Coagulation factor deficiencies, excessive fibrinolysis and disseminated intravascular coagulation.[1] Use of Heparin, blood and blood product transfusion and exposure to cardiopulmonary bypass (CPB) increases risk of bleeding.[2] Apparently, use of such techniques increase the cost of surgery, lead to inappropriate usage of human blood and expose the patients to various immunological reactions related to blood transfusion.[2]

The perioperative physician plays an important role in such cases. Antifibrinolytic agents are commonly administrated prior to surgery. Prophylactic administration of antifibrinolytic drug tranexamic acid (TA) decreases bleeding and transfusions after cardiac surgeries. Tranexamic acid is proved to be efficient with promising results in controlling post-operative bleeding in patients of Tetralogy of Fallot (TOF) undergoing intra cardiac repair.[3]

Tranexamic acid is a lysine analog that competitively binds to the lysine binding sites of plasmin and plasminogen. It has been reported to inhibit fibrinolysis with six to ten fold higher potency than any other antifibrinolytic drug.[4]

Since excessive bleeding may complicate cardiac surgery and is likely to be associated with increased morbidity and mortality[5], the current study was designed to assess the effect of tranexamic acid at a loading dose 10 mg/kg IV pre-incision, 10mg/kg in priming solution, and 10mg/kg IV after protamine. The influence on blood transfusion, thromboembolic events and mortality in patients undergoing intra cardiac repair for the correction of TOF were also evaluated.

MATERIALS AND METHODS:

The case-control study under report was conducted during July 2012 to February 2013 at U. N. Mehta Institute of Cardiology and Research Centre, Ahmedabad after approval of institutional Ethics Committee and informed consent from parents of the patients. The sample size was determined using the standard formula using Z_{crit}: (Standard Normal Deviate) corresponding to Selected significance criteria (1.96) and Z_{pwr}: (Standard Normal Deviate) corresponding to selected statistical power (0.84).

Sixty children with tetralogy of fallot undergoing primary intra cardiac repair in the age range of 2 to 15 years were randomly assigned either to no treatment (Group-A) or treatment [TA (Torrent Pharma; Gujarat) at a loading dose 10 mg/kg IV pre-incision, 10mg/kg in priming solution, and 10mg/kg IV after protamine; Group-B]. The patients with renal impairment, congenital bleeding disorders or past neurological events were excluded from the study. No patient in any of the groups experienced cyanotic spells and their hemoconcentration was not adjusted before surgery.

TA administration was initiated after induction of anaesthesia at a dose of 10 mg/kg I.V. followed by the same dose in priming solution and the same dose was continued I.V. after protamine for heparin reversal.

Anaesthesia and CPB management was similar in both the groups as per the institutional protocol except for the administration of TA in group B. The intra cardiac repair was performed by the same surgical team to rule out individual variation in surgical technique and to reduce variations in the post-operative blood loss.

Anaesthesia was induced with inj. Ketamine (Themis Pharma, Uttarakhand) and inj. Fentanyl (Troikaa Pharm, Gujarat), Inj. Midazolam (Ranbaxy laboratories, Himachal Pradesh) and Inj. Vecuronium (Health Biotech, Himachal Pradesh) for muscle relaxation. Anaesthesia was maintained on air +O2+ Fentanyl+ Vecuronium + Sevofluarane (Aesica queen Borough Ltd, U.K).

CPB management was performed with membrane oxygenator (Edwards Life Sciences, USA; Vital Oxygenator), moderate hypothermia (28°C) with non-occlusive roller pumps (Stockert SIII). Bypass circuit was primed with Ringer lactate solution (20 ml/kg), Sodium bicarbonate [7.5% (W/V) at 1ml/kg], Mannitol [20% (W/V), 0.5 gm/kg] and heparin (100 units/kg). Blood was added if hematocrit on bypass fell below 24%.

Duration from protamine administration to sternal closure was noted as an indirect assessment of coagulation status. A separate and the same intensivist team managed the patients during post-operative period. The post-operative bleeding, blood and blood product administration was especially managed by them. Post- operative blood loss was recorded for 24 hours. Usage of blood, blood products were noted during the post-operative period of 24 hours.

Blood samples were collected at a six hourly interval post-operatively to test coagulation parameters including platelet count, activated clotting time, fibrinogen and fibrin degradation product. Re-exploration rate in both the groups was also recorded.

Pre- and Intra- operative parameters like Sternal closure time (Min), Post-operative hematocrit (%), Urine on CPB (C), Cross clamp time (min), Pre-operative hematocrit (%), On CPB hematocrit (%) and CPB time (min) were noted. Post-operative coagulation tests like Activated clotting time (Sec), Fibrinogen (g/L), Fibrin degradation product (ng/ml) and Platelet count (Lacs) were also performed. Renal and cerebral complications were observed.

Results were expressed as mean ± standard deviation. Mann Whitney 'U' test and Independent't' test were performed using SPSS v 20.0. $p < 0.05$ were considered as significant.

RESULTS :

Sixty (60) children undergoing corrective surgery for TOF were equally divided into two groups. Group A (Control) did not receive any treatment while Group B (Study group) received Tranexamic acid treatment. Demographic data of children from both the groups were comparable with age (Range: 2 to 15 years), weight and body surface area (BSA; Table-1). The patients with good size pulmonary artery was similar in both the groups [(Group A; N=20); (Group B; N=22). Hypoplastic main pulmonary artery was observed in 4 patients in Group A and 5 patients in Group B. Hypoplastic LPA/RPA was observed in 6 patients in Group A and 3 patients in Group B (Table-1).

Comparison of post-operative observations are presented in Table-2. Tranexamic acid treated patients experienced significantly reduced blood loss ($p < 0.0003$), use of PCV ($p < 0.0001$) and use of Fresh Frozen Plasma (FFP; $p < 0.0001$) while platelet concentration was similar between the groups. Re-exploration was required in one patient in the control group as opposed to none in the treatment group.

Amongst the pre- and intra- operative parameters, Group B (Drug treated) demonstrated a significant decrease in cross clamp time (Fig.-1; $p<0.01$) and sternal closure time (Fig.-1; $p < 0.01$) while time on CPB machine was similar between controls and the study group (Fig.-1). There was an increase in in Post-operative hematocrit (Fig.-2; $p < 0.01$) in study group as compared to controls. On the other hand, Pre-operative hematocrit, On CPB hematocrit were similar in both these groups (Fig.-2). The urine output on CBP was similar between the two groups (Fig.-3).

Post-operative coagulation tests at 6 hours demonstrated that the drug treated group (Group B) exhibited a significant increase in Fibrinogen content (Fig.-4; $p < 0.01$), platelet count (Fig.-4;

p <0.01) and a significant decline in fibrin degradation product (Fig.-4; p <0.01) and activated clotting time (Fig.-5; p <0.01) and as compared to the control.

DISCUSSION:

Coagulation abnormalities during cardiac surgery has been widely reported. Platelet dysfunction and fibrinolysis are important causes of increased post-operative blood loss after cardiac surgeries performed under CPB.[6] Congenital heart disease patients have unbalanced coagulation system with preceding platelet dysfunction and amplified fibrinolysis; such cases are more prone to post-operative bleeding.[7]

During the natural process, fibrinogen is synthesized by liver and cleaved by thrombin to form fibrin monomers. Factor XIIIa cross-links the fibrin monomers providing stability to fibrin. Plasminogen binds to fibrinogen before its conversion into fibrin. Fibrinolysis inhibitors bind to plasmin and interfere with its ability to cleave fibrin. Hence these inhibitors are contraindicated in intravascular coagulation clots.[8] Antifibrinolytic agents such as tranexamic acid have been successfully employed in patients undergoing cardiac surgeries.

Patients with congenital cyanotic heart disease are known to benefit from anti fibrinolytic agents such as ε-aminocaproic acid which has been reported in several studies to reduce post-operative blood loss.[9,10] Tranexamic acid is ten times more potent than ε-aminocaproic acid as an anti fibrinolytic agent, with more effective binding to plasminogen. [11,12]
Reichert et al[13] studied TA in 88 children administered with a single dose of 50 mg/kg and observed no benefit in 64 non cyanotic patients in terms of reduction in bleeding or transfusion requirements. Efficacy of TA was studied by Chauhan et al[3] with different dose regimes. They found that single bolus of TA is least effective. Sustained anti fibrinolysis was produced by using TA before skin incision, with additional dose on CPB and another dose after weaning from CPB.[7,14]

Tranexamic acid is known to reduce the risk of death in adults undergoing cardiac surgeries as compared to aprotinin.[15] In addition, it has also been reported to increase the risk of seizures and persistent atrial fibrillation in adults.[15] However, the authors were unable to find relevant literature on the use of tranexamic acid especially in intracardiac repair for TOF in pediatric patients. The current study therefore is the first report from India for use of tranexamic acid in pediatric TOF repair surgery. Possibility of creation of a hyper-coaguable state is of a great concern to anaesthetists. Cerebral, pulmonary, mesenteric and retinal thrombosis have been reported so far in literature.[16]

Use of tranexamic acid in the current case-control study has very clearly demonstrated a significant reduction in blood loss obviating a reduced need for PCV transfusions and FFP similar to Brown et al.[17] In addition, the current study showed a significant improvement in coagulation parameters as reflected by a decline in activated clotting time and fibrin degradation product with the use of tranexamic acid.

Thus, the results of the current case-control study demonstrate that TA is associated with allogenic blood sparing with the current protocol [10 mg/kg IV before incision, 10 mg/kg in

priming solution and 10 mg/kg IV after protamine (for heparin reversal)] similar to the study reported by Casati et al.[18]

No thrombotic events or other complications were encountered in this study. The authors of the current study therefore understand that the coagulation parameters are likely to return to normal in 12 hours post-operatively.[19]We infer that tranexamic acid effectively reduces the blood loss, results into improved coagulation parameters at the current administrative dose in pediatric patients undergoing TOF repair. The current report however, is based on a series with smaller number of patients and demands studies with a large number of patients.

CONCLUSION:

Tranexamic acid at a dose of 10mg/kg I.V. is highly effective as antifibrinolytic agent in children with TOF undergoing intra cardiac repair. It effectively reduces post-operative blood loss and transfusion in the form of blood, fresh frozen plasma, platelets. Routine use of I.V. tranexamic acid with a protocol of (i) at pre-incision, (ii) during priming and (iii) heparin reversal at 10 mg/kg is advocated.

Table 1- Demographic data of two groups

Demographic data/Diagnosis	Group A (N=30) Mean±SD	Group B (N=30) Mean±SD	p Value
Age (yrs.) Mean±SD	5.97±3.76	5.50±3.71	0.6278
Male/Female ratio	16/14	20/10	
Weight (kg)	13.83±6.88	13.83±6.68	1.0000
BSA (m^2)	0.58±0.19	0.55±0.15	0.5000
Diagnosis			
TOF with good size PA	20	22	-
TOF with hypo plastic MPA	04	05	-
TOF with hypo plastic LPA/RPA	06	03	-

Group A and group B were comparable in terms of children age range (2 to 15 years), weight, and body surface area.

Table 2- Postoperative observations in two groups

Postoperative observation	Group A(N=30) Mean±SD	Group B(N=30) Mean±SD	p-Value
Blood loss (ml/kg/24 hrs.)	33.70±16.78	20±9.78	0.0003
PCV used (ml/kg/24 hrs.)	20.49±7.70	13.70±4.24	0.0001
FFP used (ml/kg/24 hrs.)	18.30±4.71	12.56±2.42	0.0001
Platelet concentration (ml/kg/24 hrs.)	6.80±1.99	6.50±1.78 (NS)	0.5407

Re-exploration	(1/30) (3.33)	(0/30) (0) (NS)	-

Post-operative data is in form of blood loss, usage of blood, blood products, which shows group B had lower blood loss and it is reflected as lower usage of blood, blood products in group B compared to group A.

Re-exploration rate was low in group B.

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(10) STRESS PHYSIOLOGY AND IMPACT OF STRESS ON CORONARY ATHEROSCLEROTIC HEART DISEASES

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Key words: **stress, physiology, cardiovascular diseases**

Abstract:

Large number of epidemiological studies including Framingham's study have documented that stress is a important risk factor of Atherosclerotic coronary heart disease. Even and above our day to stresses related to home and job we have witnessed major acute stressful events i.e. earth quack, tsunami, flood, terrorist attacks, civil war, riots, nuclear blasts…. Historical point of view Hans Selye a father of the study of stress, established relationship between chronic stress and effects on the body. He described three stages of stress response as General Adaptation Syndrome" [GAS]. The three stages are 1] Alarm: Fight or Flight" reaction: body mobilizes resources to combat threat; activates the sympathetic nervous system 2] Resistance: Enhanced ability to fight stressor via moderate physiological arousal; ability to withstand additional stressors (e.g., infection) is reduced. 3] Exhaustion: Depletion of resources brings on diseases and disorders (e.g., chronically high heart rate and blood pressure increase chances of heart attack and stroke). Stress activates the *hypothalamus-pituitary-adrenal axis,* a group of structures that help the body cope with stress. The hypothalamus activities the pituitary gland, which in turn releases hormones that stimulate the adrenal glands to release the stress hormones epinephrine, nor epinephrine, and cortisol. There is release of catecholamine epinephrine (adrenaline), nor epinephrine (noradrenalin) with stimulation of Sympathetic Nervous System. Incidentally majority of studies are epidemiological .Recently there more studies explaining the pathophysiological mechanism how the stress causes CHD. Endocrinal abnormalities especially hypothalamo-pituitary-adrenal (HPA) axis, and inhibited sex steroid result an elevated waist/hip circumference ratio (WHR) and visceral obesity ,combined with insulin resistance is hall mark of metabolic basis of CV disease. Insulin resistance and other risk factors dependent on the hyperinsulinemia following insulin resistance are associated with dyslipideamia i.e. increase LDL cholesterol and triglyceride and decrease, are hallmark or culprit of atherosclerosis . Chronic stress is associated with reduced physical activity and sedentary life style further induces a state of insulin resistance. When beta cells are no longer able to compensate for insulin resistance by adequately increasing insulin production, impaired glucose tolerance appears, characterized by excessive postprandial hyperglycemia. Impaired glucose tolerance may evolve into overt diabetes another risk factor of CHD.. Because all these conditions are also accompanied by the presence of an oxidative stress, oxidative stress one of the pathogenic mechanism linking the stress insulin resistance with dysfunction of both beta cells and endothelium, eventually leading to overt diabetes and cardiovascular disease. There is evidence that chronic stress may induce a chronic inflammatory process culminating in atherosclerosis. These increased oxidative stress and inflammatory events, caused by stress, may account for the approximately 40% of atherosclerotic patients with no other known risk factors. A heightened state of cardiovascular activity, injured endothelium, and induction of adhesion molecules on endothelial cells to which recruited inflammatory cells adhere and translocate to the arterial wall. Shedding of adhesion molecules and the appearance of cytokines, and APRs in the blood are early indicators of a stress-induced APR and may be predictors of future cardiovascular disease. The most important things are 1] stress is everywhere and each and every one are exposed to stress 2]CHD is multi factorial disease and stress is one modifiable risk factor. Stress management interventions studies have further supporting the fact such successful intervention of stress management is associated with up 74% reduction in cardiac events

Introduction:

Stress, is defined as a mismatch between perceived demands and perceived capacities to meet those demands .Physiologically Stress is "non specific response to stimuli". The response carry series of neural endocrinal response for physical survival. In physics and engineering point of view, there are actually two words stress and strain .Stress is an external force applied to an object and strain is the changes in the object in response to force. Let us take example. Suppose I hit a hammer on a steel vessel, it will generate hump on the vessel. So the hitting on a vessel with a hammer is stress and the hump is strain .But Now suppose I hit my small hammer on a rubber tire of a car. Nothing will happen similar if I hit an hammer on air filled rubber tube, nothing will happen due to elastic properties. Now let et me begin with conclusive remark ,if we want be free from effects of stress we have to become elastic means flexible, adaptable and ready to change in the era of ever changing environment .This is the principal of survival of fittest.

In context to stress and strain, physiological point of view stress has two meanings.

1] Stress is a condition in the external environment that makes unusual demands on the organism, such as threat, failure. Homeostasis point of view external environment is constantly changing. And if anything in this universe is eternal than is change and if organism has to survive it must adapt to change. So the stress and inevitable.

2] strain is an internal condition as part of a response to a stressful situation.

If an organism i.e. human being under stress, and body reacts in several ways.

Stresses are inevitable .It can be physical i.e. trauma, illness mental i.e. loss of job dear one,, infection ,it can be both i.e. major surgery ,failure in examination ,divorce .Historical point of view mind well the real stresses the human kind has faced over the evolution are different from what we face to days. Our ancestors have to face the stresses almost every minute. The stresser were life threatening i.e. attacks by wild animals ,from predators of same species ,fighting for prey and survival of self ,offspring……The inbuilt stress response is meant for such a life threatening stimuli. The purpose of the response was very simple *the survival* .In such situation there were only two options either fight or flight .So this fight and flight response is in build response to any perceived life threatening situations. It activates the *hypothalamus-pituitary-adrenal axis,* a group of structures that help the body cope with stress. The hypothalamus activities the pituitary gland, which in turn releases hormones that stimulate the adrenal glands to release the stress hormones epinephrine, nor epinephrine, and cortisol. There is release of catecholamine epinephrine (adrenaline),nor epinephrine (noradrenalin) with stimulation of Sympathetic Nervous System.

Physiological Stress Response :

[A] Immediate effects of stress

Arousal of Sympathetic Nervous system

Epinephrine and norepinephrine released

Time: 2 to 3 seconds
Effects are forceful pumping of heart .Tachycardia
More blood flow to vital organ i.e. brain, heart and exercising muscle
Increase alertness
Papillary dilation

[B] Intermediate effects of stress

Adrenal medulla
Epinephrine and norepinephrine
release from
Time: 20 to 30 seconds
Effects same as above

[C] Prolonged effects of stress

ACTH -Glucocoiticoids,
various metabolic processes
Increase blood glucose and fatty acids to supply fuels to heart, brain and skeleton muscles

- Time: minutes, hours, days, or weeks

Physiologic Changes	
Autonomic nervous system	
Musculoskeletal system	
Psychoneuroendocrine system	
Limbic system	
Acute Changes	
Increased	**Decreased**
Respiration	Lipid metabolism
Heart rate	Bowel / bladder function
Blood pressure	Immune meditation
Muscle tension	Blood flow to extremities
Corticosteroid release	
Platelet aggregation	
Cardiac Symptoms	
Anxiety	
Angina	
Arrhythmia	
Myocardial infraction	
Sudden cardiac death	

Now in context to clinical science, if we ask the patient about having stress at home or at job place .meaning of stress is simple. It can be at home marital problems, close relative suffering from illness i.e. cancer, schizophrenia, near dyeing, divorce or job related stress i.e., conflicts with bosses, promotion related problems ……
Just as physician qualitatively rate the extent of heart murmurs, psychologists and physiologists have a variety of ratings schemes for evaluating stress. Given that the complaint is entirely subjective, one either relies totally on the patient's self-report or else applies generally agreed upon rules for how stressful a given event is for most people. Alternatively, one can observe subjects during exposure to a stressor and then measure physiological and/or behavioral responses. Some researchers feel that the focus should not be on major life stressors but rather the daily hassles in life (rush hour traffic, job stress and marital conflicts).

Some important life events considered as severe stress

Death of partner
Divorce
Separation from partner
Jail sentence
Death of close family member
Injury or illness to yourself
Marriage – your own.

Chronic stress:

Hans Selye a father of the study of stress, established relationship between chronic stress and effects on the body. The physiological and psychological response to situations that threaten or challenge us and that require some kind of adjustment. He describe three stages of stress response as General Adaptation Syndrome" [GAS].
The three stages are

1. **Alarm**
   Fight or Flight" reaction: body mobilizes resources to combat threat; activates the sympathetic nervous system
2. **Resistance**
   Enhanced ability to fight stressor via moderate physiological arousal; ability to withstand additional stressors (e.g., infection) is reduced.
3. **Exhaustion**
   Depletion of resources brings on diseases and disorders (e.g., chronically high heart rate and blood pressure increase chances of heart attack and stroke).

In modern era the stress is different from our ancestors in two way
1] The real threats are not wild animals, predators and prey but they are different and incidentally man made. Some examples are conflicts with boss and spouse, traffic jam,

2] The stresses are regular and almost daily routine i.e. whether we can reach office in time or not…Even young student are not exception. Educational stress itself a branch of studying stress physiology.

These frequent, recurrent stresses do not put our body into relaxation and recover completely. So we are ultimately the victims of chronic stress, more dangerous than acute stress.

Typical stress response in human being is divided into three component

- Physiological component: Arousal, hormone secretion.
- Emotional Component: Anxiety, fear, grief, resentment, excitement (if stress is from challenge).
- Behavioral Component: Coping strategies (both behavioral and mental)—problem focused and/or emotion-focused.

Ultimately end result of any stressful events is depend upon coping ability and support system .individual' attitude, personality social support system also play significant role. These factors generate Appraisal to stress in limbic system of brain.

Appraisal point of view Selye assumed that stress depended only on the intensity of the stressor while another psychologist Lazarus proposed that the stress is a result of mental processes.
Lazarus and Folkman's Theory for perceived stress and its management stetagies

1] Primary Appraisal:
Is Stressor Negative?
If it is negative, does it involves harm or loss, threat, or challenge (chance to grow).
Yes
[2] Secondary Appraisal: Can I Control the Situation?
If coping resources are adequate, then consider options for coping strategy:

[A] Problem-focused coping strategies.

A response aimed at reducing, modifying, or eliminating a source of stress (e.g., if grades in a course are low, reduce work hours, change study strategy, etc.).

or

[B] Emotion-focused coping strategies.

i.e. emotional impact of the stressor (e.g., denial, religious faith, wishful thinking, humor,).

In the low grades example, you can reappraise the stressor and reduce the importance you attach to that course, that major or academic work in general.
Two major emotion-focused strategies are: MEDITATION and BIOFEEDBACK
Consider, CHANGE PRIORITIES IN LIFE : HEALTH FIRST

STRESS AND CARDIOVASCULAR EVENTS:

Cardiovascular diseases are the leading cause of death, mainly the death related to coronary atherosclerotic heart diseases i.e. myocardial infarction, sudden death, ventricular fibrillation…., Epidemiological studies have implicated stress as one of the risk factors and potentially modifiable risk factors for cardiovascular disease (CVD) but little is known about the mechanisms that underlie this connection. Individuals belonging to the Type-A personality group are those people who are more exposed to stress and present a big chance of suffering from a physical or mental disorder related to stress, i.e. hypertension, and CHD.

However, the physiological mechanisms accounting for these associations between personality traits on one hand, and cardiovascular morbidity and mortality on the other are not completely understood. Potential mechanisms are limbic and hypothalamic–pituitary–adrenal deregulations, dysfunctions of the autonomic control of the heart, altered blood platelet function, and non-compliance to medical treatments. Experimental evidence for an association between a propensity for lethal arrhythmias and signs of either increased sympathetic or reduced vagal activity has encouraged the development of quantitative markers of autonomic activity. Stress increases blood pressure, and prolonged high blood pressure can damage the heart or cause a strokes, myocardial infarcts and renal events .Recently more attention is given to metabolic alteration in chronic stress and its relationship with atherosclerotic heart diseases.

If the person fail to manage stress, the person is susceptible to anxiety, fear, grief, depression. There is increasing evidences to suggest a link between sadness, depression and coronary heart diseases. Many investigators have reported a strong correlation between depression and cardiovascular mortality. It has been noted that depression is associated with sedentary and other negative life styles, abnormal autonomic variability of heart rate and a altered platelets functions.
Stress, resulting in an uncontrollable defeat reaction, has been shown by James Henry to be followed by specific endocrine abnormalities, including sensitization of the hypothalamo-pituitary-adrenal (HPA) axis, and inhibited sex steroid . The resulting an elevated waist/hip circumference ratio (WHR). Intraabdominal, visceral fat masses--combined with insulin resistance is hall mark of metabolic basis of CV disease and are powerful risk factors for cardiovascular disease, diabetes and stroke. Endocrine chain of events during chronic stress are primary factors, followed by visceral fat accumulation, insulin resistance and other risk factors dependent on the hyperinsulinemia following insulin resistance which is associated with dyslipideamia i.e. increase LDL cholesterol and triglyceride and decrease HDL C a hallmark or culprit of atherosclerosis.

Chronic stress with reduced physical activity induces a state of insulin resistance. When beta cells are no longer able to compensate for insulin resistance by adequately increasing insulin production, impaired glucose tolerance appears, characterized by excessive postprandial hyperglycemia. Impaired glucose tolerance may evolve into overt diabetes. These 3 conditions, i.e. insulin resistance, impaired glucose tolerance, and overt diabetes, are associated with an increased risk of cardiovascular disease. Because all these conditions are also accompanied by the presence of an oxidative stress, oxidative stress one of the pathogenic mechanism linking

the stress insulin resistance with dysfunction of both beta cells and endothelium, eventually leading to overt diabetes and cardiovascular disease.

Chronic stress may induce a chronic inflammatory process culminating in atherosclerosis. These inflammatory events, caused by stress, may account for the approximately 40% of atherosclerotic patients with no other known risk factors. It is argued that by activating the sympathetic nervous system, the hypothalamic-pituitary axis, and the renin-angiotensin system, stress causes the release of hormones such as catecholamines, corticosteroids, glucagon, growth hormone, and renin, and elevated levels of homocysteine, which induce a heightened state of cardiovascular activity, injured endothelium, and induction of adhesion molecules on endothelial cells to which recruited inflammatory cells adhere and translocate to the arterial wall. An acute phase response (APR), similar to that associated with inflammation, is also engendered, which is characterized by macrophage activation, the production of cytokines, other inflammatory mediators, acute phase proteins (APPs), and mast cell activation, all of which promote the inflammatory process. Shedding of adhesion molecules and the appearance of cytokines, and APRs in the blood are early indicators of a stress-induced APR and may be predictors of future cardiovascular disease.

The studies have reviewed effects of acute stressors among people facing disasters (earthquakes), Job stress, marital unhappiness, stress of caregiving ,Type A behavior pattern, Hostility, depression found to be significantly correlated with incident of Sudden death, myocardial infarction, myocardial ischemia, wall motion abnormalities as studies by LV angiography, arrhythmias, angina… Fortunately approaches are available for stress management that can decrease patients' suffering and enhance their quality of life.

Earthquakes and CHD: Significant number of studies indicate the increase incidence of CHD event after earthquakes .Factors associated are the emotional trauma acting ,injuries and loss of physical and near ones , living in cramped emergency camps , facing disrupted sleep. During the 1999 earthquake in Taiwan, 12 patients were studied with Holter monitoring. It was observed that during earthquake, increases in heart rate, HR variability itself changed, with a relative drop in high-frequency variability and an increase in the low-frequency/high-frequency ratio, denoting relative withdrawal of parasympathetic nervous system activity and an increase in sympathetic nervous system (SNS) activity. Cannon' et al observed that during earthquake in Japan, blood viscosity and markers of procoagulant activity i.e. fibrinogen, von Willebrand factor, and D-dimer increased. The Northridge, California earthquake, daily numbers of deaths attributed to cardiovascular disease increased dramatically on the day of the earthquakes.. Stress Cardiomyopathy is a condition where left ventricular angiogram studies by radiological or nuclear LV angiography. The study will demonstrate wall motion abnormality characteristic of stress cardiomyopathy. Orth-Gomer et al**.** studied the impact of work stress and marital stress on the subsequent incidence of CAD in a cohort of Stockholm women followed for ~5 years. Marital stress was associated with a 2.9-fold increased risk of recurrent events, whereas work stress did not predict subsequent coronary events in these women.

MRFIT Multiple Risk Factor Intervention Trial found that chronic work stress and marital dissolution increased the risk of cardiovascular mortality in men who were followed for 9 years.

Provocative tests for Psychological/emotional stressor i.e. arithmetic exercise and similar activities are under way and some results are associated with elicited extensive changes in regional circulation of myocardium and almost as consistently evocative of myocardial perfusion abnormalities .The changes were not as straightforward as those with exercise as was exercise testing. 60% of CAD patients developed wall motion abnormalities during mental stress testing .Such tests can be major tool for research on stress.

Implantable defibrillators are the one more tool to access to data to correlate stress and arrhythmias. It has been observed that horrific disasters doubled the rate of ventricular arrhythmias in patients fitted with implantable defibrillators.

Studies have found that distressed caregivers had an increased risk of hypertension when followed over a 6-year period. Other reports from this group have found that caregivers have increased levels of D-dimer, a circulating procoagulant factor, more sleep disruption, and higher level of circulating plasma inflammatory cytokines.

Whether stress "caused" or "contributed to" the development of a condition of cardiovascular event is an interesting question to medical researcher. Because stress is everywhere, what is logic it do to identify a risk factor that cannot be modified like age, sex and genetics…….. ? Answer is :" Stress is no different from other background cardiac risk factors such as genetics or age. There is no reason to ignore such factors, just because they are not modifiable. Stress can be modified through numerous approaches. It remains to prove that such stress modifications consistently decrease the risk for MI and cardiac death. In Duke study an interventional Stress Reduction group underwent 4 months of training in exercise or stress management versus just standard care were compared. Results showed after five years, there was 74% reduction in cardiac events.
100s of interventions for stress management are discussed in literature.

Some Interventions For Stress Management

Formal psychotherapy,
Medications,
Time management
Progressive relaxation training,
Hypnosis
Yoga and Meditation,
Regular exercise.
……

EFFECTS OF STRESS MANAGEMENT by TM meditation:

- decreased oxygen uptake (VO2), CO2 output (VCO2),
- electromyograph (EMG) improvements during dynamic exercise, respiration, lactate levels, systemic vascular resistance (SVR), heart rate,

- and increased production of the essential amino acid phenylalanine.

Endocrine and autonomic effects of stress management

- Reduced vasomotor activity.
- Improvements related to blood pressure, thrombosis, and cholesterol and triglyceride levels all can be demonstrated

Effective Stress management leads to reduced

- anxiety,
- depression,
- hostility, and
- aggression,
- better insight, reduced habit reliance,
- increased self-efficacy,
- increased empathy, and
- increased spirituality.
- chronic pain,
- insomnia,
- hypertension,
- coronary disease,
- shown *to improve fertility.*

CONCLUSION:

When we under stress our healthy dietary habits wane away we tend to increase our weight and obesity , especially man tends to tobacco smoking, drinking alcohol, other unhealthy habits other high-risk activities, and leads to increased sedentary activity i.e. Viewing TV …and decrease in physical exercise .This all factors aggravate the effects of stress on cardiovascular system .Just negotiating with stress by effective stress and time management leads favorable effects on development of atherosclerosis coronary heart disease.

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(11) COMPARISON OF REGIONAL WITH GENERAL ANESTHESIA TECHNIQUES FOR NON CARDIAC SURGEY IN PATIENT WITH ISCHEMIC HEART DISEASE.

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INTRODUCTION

As incidence of ischemic heart disease (IHD) has increased dramatically nowadays, we are finding at least one or two patients of IHD daily in operating lists of our hospital. It is a life style disease and also found in younger age group.

Due to advancement in techniques and gazettes of surgery and anesthesia, more and more high risk patients are operated which includes IHD as a major risk group. The cardinal rule for anesthesia in IHD patients is that myocardial oxygen requirement should not be allowed to exceed myocardial oxygen supply. Myocardial oxygen demand can be reduced by reduction in heart rate and after load. Electrocardiograph (ECG) monitoring during anesthesia may reveal fresh events. (12) We have conducting a study in our hospital to evaluate better method of anesthesia for patients of ischemic heart disease operated for non cardiac surgery.

AIMS OF STUDY

1) To compare different regional anesthesia techniques with general anesthesia technique in patients of IHD undergoing non cardiac surgery.
2) To compare hemodynamic stability, heart rate, and blood pressure variability in different techniques.
3) TO compare the complications (any new cardiac event) in different techniques.

MATERIAL AND METHODS

The study comprised of 100 patients of ischemic heart disease subjected to different non cardiac surgeries under general anesthesia and under various regional anesthesia.

Inclusion and exclusion criteria were decided.

INCLUSION CRITERIA

1. Patients having history of myocardial infarction in past.
2. ECG changes suggestive of myocardial ischemia, i.e. Asymptomatic T wave inversion, ST segment depression, Presence of pathological Q wave.(12)
3. Patients taking anti angina medication.
4. Patient with reports of TMT or coronary angiogram suggestive of IHD.
5. Patient with angina of exertion in NYHA class1 or 2.
6. Patient for elective surgery and with sinus rhythm.

EXCLUSION CRITERIA

1. History of myocardial infarction in last 6months.
2. ECG changes in symptomatic patient-suggestive of acute myocardial ischemia.
3. Unstable patients.

4. Patients with angina on exertion NYHA class 3 or 4.patients showing echocardiography evidence of global left ventricular hypokinesia.
5. Patients with ejection fraction less than 50%.

Clinical examination included all the systems.

Base line routine investigations were done. Special investigation like 2D Echo was asked when needed. Procedure explained to the patients and VAS Score was explained & informed written consent was taken.

Patients were randomly allocated into two groups of 50 each.

1. **Group- A :** patients operated under general anesthesia.
2. **Group- B :** patients operated under regional anesthesia.

GROUP-A

Patients were pre medicated with intravenous inj. Glycopyrrolate +inj. Midazolam. General anesthesia was induced with sodium thiopentone Neuromuscular blockade was carried out with i.v. vecuronium bromide. mechanical ventilation with mixture of 50% oxygen, 50% nitrous oxide and isoflurane / sevoflurane(14) in low concentration. During surgery patients were monitored by multipara moniter, monitoring H.R, blood pressure, SpO_2, $EtCo_2$ and ECG. . Postoperative analgesia was given with i.v. Tramadole and bupivacaine infiltration of the scar. Postoperative oxygen was supplied in ICU using oxygen mask until 4 hours.

GROUP –B

Procedure was explained to the patient. He was asked to communicate if any feeling of uncomfort he feels during the process..

All provisions for general anesthesia and all measures for resuscitation were kept ready.

SPINAL ANESTHESIA

2 to 2.5ml of Inj. bupivacaine 0.5% injected. Level of sensory block achieved was restricted to T10/T8.

EPIDURAL ANESTHESIA

0.5% Bupivacaine 2 mg/kg injected in the space. Epidural catheter was advanced for the purpose of post operative analgesia. Level of sensory block achieved was not higher than T10/T8level.

PERIPHERAL NERVE BLOCK

With the help peripheral nerve locator, paresthesia was elicited, Inj. Bupivacaine 0.5% were given in a volume as per the need of the block. Through aseptic measures were taken.

Heart rate, blood pressure, Spo2, ECG, were recorded at every five minutes.

CRITERIA FOR DEFINING COMPLICATIONS:

1. Persistence of new arrhythmia for more than a minute or ventricular ectopics more than 6 per minute were considered as complications.
2. Any positive or negative deviation of 20 mm of Hg in blood pressure or 20 beats per minute in heart rate from baseline were considered significant for Group A patients.
3. For Group B patients, absolute heart rate of less than 60 / min. and more than 120 / min were labeled as bradycardia and tachycardia respectively while systolic blood pressure more than 150 (Hypertension) and less than 90 (hypotension), diastolic blood pressure more than 90 (Hypertension) and less than 60 (Hypotension) were labeled accordingly. Complications were treated adequately per operatively.
   Patients were monitored in ICU for 2 days postoperatively to look for development of new ECG abnormalities, chest pain, respiratory problems and other complications. (30).

OBSERVATION AND RESULTS

Both groups were demographically comparable. Age group selected was ranging from 30-70 years. Majority patients in both the groups belongs to 50-60 years (28%in group-A, 32% in group B), and 60-70 years (32% in group A, 28% in group B).

TABLE I: PRESENCE OF CLINICAL RISK FACTORS IN BOTH GROUPS

	GROUP-A	GROUP-B	P Value
MAJOR	**0**	**0**	**0**
INTERMEDIATE			
Mild Angina (NYHA class I/II)	**25**	**25**	1
Prior MI(Q Wave / old MI in ECG)			
Compensated Heart Failure	**1**	**4**	0.17
Diabetes Mellitus	**0**	**0**	0
Renal insufficiency	**2**	**3**	0.65
	0	**0**	0
MINOR			
Advanced age (>65)	**3**	**4**	0.70
Abnormal ECG	**25**	**25**	1
Rhythm other than sinus	**0**	**0**	0
H/O Stroke	**0**	**1**	0.31
Uncontrolled Hypertension (> 140/90)	**7**	**7**	1

Debrata Mukerji and Eagle et al (2).

Most of the surgeries conducted in this study involved intermediate surgical risk.
In Group A, 50% patients were given isofluane and other 50% were given sevolurane.
In Group B, 48% patients were given Spinal anesthesia, 24% were given Epidural anesthesia, 28% were given nerve blocks.

Table 2; INCIDENCE OF COMPLICATIONS IN GROUP A PATIENTS

	ISOFLURANE	SEVOFLURANE	P Value
HYPOTENSION	10 PATIENTS (40%)	7 PATIIENTS (28%)	0.46
HYPERTENSION	12 PATIENTS (48%)	7 PATIENTS (28%)	0.25
BRADYCARDIA	1 PATIENT (4%)	3 PATIENTS (12%)	0.31
TACHYCARDIA	17 PATIENTS (68%)	3 PATIENTS (12%)	0.001
ISCHEMIC CHANGES	4 PATIENTS (16%)	NO PATIENT	0.04
ARRHYTHEMIAS	4 PATIENTS (16%)	NO PATIENT	0.04

Table 3; INCIDENCE OF COMPLICATIONS IN GROUP B PATIENTS

	SPINAL	EPIDURAL	NERVE BLOCK	P Value
HYPOTENSION	6 PATIENTS (24%)	2PATIENTS (16%)	0 PATIIENTS (0%)	0.03
HYPERTENSION	2 PATIENTS (4%)	0 PATIENTS (0%)	0 PATIENTS (0%)	0.13
BRADYCARDIA	2 PATIENTS (4%)	0 PATIENTS (0%)	0 APTIENTS (0%)	0.13
TACHYCARDIA	4 PATIENTS (8%)	0 PATIENTS (0%)	0 PATIENTS (0%)	0.01
ISCHEMIC CHANGES	2 PATIENTS (4%)	0 PATIENTS (0%)	NO PATIENT (0%)	0.13
ARRHYTHEMIAS	2 PATIENTS (4%)	0 PATIENTS (0%)	NO PATIENT (0%)	0.13

DISCUSSTION & CONCLUSION.

Because of wide By careful understanding of the physiology of coronary circulation and knowing the factors that increase myocardial oxygen demand and factors that decrease myocardial oxygen supply, we can improve the anesthetic management of the patients with IHD undergoing noncardiac surgery, Availability of anesthestic agents, one can say that there is no universally accepted agents or techniques that apply to all patients of ischemic heart disease. Each patient should be treated as an individual with unique problems.

Preoperative optimization of blood pressure and heart rate is essential to achieve better out come. Incidents of Post operative myocardial infarction and dangerous arrythemias are more seen in IHD patients undergoing noncardiac surgery.(6) These patients should be kept in intensive care unit (ICU) for 2-3 post operative days. Beta blocker along with calcium channel blockers were used for the purpose. (8)

A comparison was made between general (group A) and various regional anesthesia (group B) techniques. Heart rate variability and blood pressure fluctuations were more apparent in group A patients, which were seen intra operatively (20 minutes after induction), in B group hemodynamic changes were seen during immediate post induction period. Elderly patients had higher complication rate in group-A. Postoperative minor

complaints were more common in group-A (32% vs 8%). Overall complication rate was significantly higher in general anesthesia group (76%) as compared to regional anesthesia group (24%), in our study. There were more chances of fresh IHD –many times life threatening in elderly patients undergoing non cardiac surgery under General anesthesia. (9)General anesthesia was also less effective in relieving post operative pain as compared to regional anesthesia group irrespective of mode of analgesia used.

In group A, patients receiving sevoflurane as a maintenance agent suffered less cardiac complications as compared to patients receiving Isoflurane.(5). In group B, patients who were operated under peripheral nerve block had no complication as expected while epidural sub group was hemodynamically more stable than spinal sub group.

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(12) CHILD GUIDANCE ESTABLISHMENT & AWARENESS

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ABBREVIATION

CGC- Child Guidance Clinic
PSP-Poor Scholastic Performance
ADHD- Attention Defecit Hyperactivity Disorder
GAD- Generalized Anxiety Disorder
PTSD- Post Traumatic Stress Disorder
PDD- Pervasive Developmental Disorder
DSM- Diagnostic and Statistical Manual of Mental Disorder
EEG- Electroencephalograph
CT- Computerised Tomography
IQ- Intelligence Quotient
LD- Learning Disorder
NGO- Non Government Organization

ABSTRACT:

"Aim: provision of child guidance services in the department of psychiatry

Objectives: to sensitize the teachers and students of school parents, doctors about child guidance clinic.

Methodology: prospective observational study

Sample size: 100 patients

Sampling methods: randomly selected patients

Method of collection of data: sensitize teachers ,parents,whose students or children having problems like poor performance , behavior problems , mental retarded can visit to child guidance clinic. Within 6 months data will be collected and will be analysed.

Study period: 1st feb 2013 onwards.

Conclusion: learning disabilities, behavioural problems can be prevented as well as can be cured with constant follow up and guidance to parents as well as teachers and counselling. Mental retarded can be improve or can be taken under control if follow child guidance clinic."

INTRODUCTION

In India, though children constitute nearly 40% of the population, child mental health care has received scant attention in service, research and training. Child and adolescent psychopathology is a major concern among health professionals and educators in the developed countries. It is estimated that 10-20% of children and adolescents are affected annually by psychiatric problems and their psychiatric morbidity accounts for five of ten leading causes of disability for those aged

five years and above. Prevention is better than cure. It is well known that adult psychopathology and mental health problems are only an extension of child mental health problems and continuum in psychopathology.

Performance which need to be rectified to help them succeed in a school setting. Most children who do poorly in school are intelligent enough and possess numerous other skills that can

help them get ahead in their lives; these need to be identified and nurtured.

The Child Guidance Clinic (CGC), is a multidisciplinary team of professionals (psychiatrists, physician, educational psychologist, social worker, special educator & language pathologist) working together towards the cause of children with developmental disabilities.

Learning disabilities, behaviour problems can be prevented as well as can be cured with constant follow up and guidance to parents as well as teachers and councelling. Mental retardation can be improve or can be taken under control if follow child guidance clinic. Child and adolescent mental health which is future of our country, is given inadequate attention. As overall development of any country is dependent on positive mental development of its children, it is definitely the challenge of day to cope up with poor health that is crippling millions of children in India.

AIMS AND OBJECTIVES

1. Provision of child guidance services in the department of psychiatry
2. To sensitize the teachers and students of school, parents, doctors about child guidance clinic….

METHODOLOGY

STUDY DESIGN:

This present prospective , observational involved all the patients who attended the child guidance clinicat department of psychiatry in our institute during the period 01 feb 2013 to 31st may 2013 from the case record which included the history taken from the parents, teachers as well as the children. Psychological testing, electroencephalogram (EEG), computer tomography (CT) scan were undertaken along with referral to pediatrician and neurologist, wherever needed. Diagnosis were made according to the criteria in DSM-IV-TR.

Duration of the Study :

This study was conducted within 6 months duration.

Study Sample :

Sample size of this study was 100. Sample consisted of patients who attended child guidance clinic of our department on specified days.

Tools Used in the Study :

Semi structured performa of the patients.

DSM – IV-TR Criteria used for evaluation and diagnosis of each childhood disorder

Statistical Analysis :

We have used Graph Pad Prism 5 software version 5.01 for statistical analysis.

OBSERVATION & RESULT

Project Description :

We have established a child guidance centre at the department of psychiatry, M. P. Shah

Medical College and G. G. Hospital, Jamnagar in February 2013. This centre is well equipped with infrastructure and human resources. It has a big spacious properly ventillated room for CGC where children are assessed for their problems .it has adjoining seminar room having enough seating facilility equipped with projector and screen for demonstration of live videos related childhood behavior problems and for other educational purpose. Centre has also many posters fitted over wall which shows different childhood abnormal behavior pattern for awareness of parents and teachers.

A multidisciplinary approach is adopted while evaluating children with problems in learning and behavior. A team of dedicated people works in this regards at our CGC.

The Team :

Most children tend to have a combination of problems: developmental, neurological, academic and emotional. Such **amultidisciplinary approach** is made possible at the CGC. A dedicated team of psychiatrist, psychologist, social worker, special educator offer appropriate assessment, guidance and treatment.

The Setting :

Our team works in the open setting of CGC, which encourages children and their parents to seek help for learning difficulties, emotional or behavior problems without stigma and fear. The need of the hour is for schools to have access to an authentic resource centre with various specialists, where they can confidently seek expert opinion about the child's performance in order to help them.

Services at Our CGC

Our services include professional evaluation for:

- Poor school performance (PSP) and learning disorders (LD)
- Levels of intelligence (IQ)
- Academic skill deficits in reading, writing, spelling, math, etc.
- Speech and language disorders: stuttering, aphasias, etc
- Motor skill deficits; poor handwriting, clumsiness, etc.
- Attention deficit hyperactivity disorders (ADD/ADHD)
- Defiant/ oppositional behavior, conduct disorders
- Addiction to TV/ Internet, disorganized routines
- Tics/ tourette disorder,
- epilepsy
- Obsessive behavior/ disorders
- Anxiety, school phobia, exam phobia and various fears in the child
- Depression, social withdrawal, loss of interest
- Developmental neurological disorders
- 'Functional' symptoms like headache, breathlessness, stomachache, frequent sickness, absenteeism from school, etc.

Stages of Evaluation: Protocol

1. Intake Interview: This is a major step in diagnosis, with information from parents, child, and report from teacher and samples from the child's work, to identify the child's problems and to determine which other specialist needs to examine the child, if necessary.

2. Physical/ Neurological Examination: This is done to rule out soft neurological signs and sensory deficits. Tests like EEG or other investigations may be done for the same.

3. Assessment of Poor School Performance (Learning Disorders): The basic sets of assessment include: Tests of general intelligence (IQ). Assessment of Academic Skills- Reading, Writing, Spelling, Math and Language. Assessment of Pre-academic Skills (for children below 6 years).Tests of Speech and Language, Identification of Special Abilities/Aptitude Testing Neurological assessment and EEGetc.

4. Assessing Overlapping Disorders: A significant part of the evaluation includes identifying other co-existing disorders. This is done by focused evaluation and multi-axial diagnosis.

5. Multidisciplinary Diagnosis and Documentation: After completion of assessments, a multidisciplinary diagnosis is made. Counseling& Guidance is offered for the child and parent or guardians. Follow-up sessions are planned, remedial therapy is given and medical intervention, if any is suggested.

Outreach Programmes

The **CGC Outreach Programmes** include the following:

- Workshop on "Learning Strategies" for Children.
- Workshop on "Life Skills" for Children.
- Workshop / Sensitization modules for Schools, Teachers and Parents.
- Consultation and Liaison for Resource Room Services in Schools.
- Training Programmes for Counselors, Social Workers and Special Educators.

Purpose / Goals

1. Diagnosis and Management of scholastic and Psycho-social disorders among children and adolescents.
2. Special educators services - psycho-educational assessment of children, remedial education for children with Learning disabilities, Attention deficit disorder and Slow learners.
3. Awareness programs for the community with special focus on students, teachers and parents which include:
   a) Early detection of learning disabilities and attention deficit disorders.
   b) Early detection of psychiatric disorders, which hamper the child's educational progress.
   c) Counseling to parents and teachers regarding handling of children with educational difficulties.
   d) Vocational guidanceand Aptitudetestingof adolescents.

These programs are carried out through lectures, panel discussions, poster exhibitions, booklets and printed materials, interactive workshops, programs via videos, etc. The awareness programs carried out at the Centre are FREE OF COST for the participants.
This present prospective, observational study involved all the patients who attended the child guidance clinic at department of psychiatry in our institute during the period 01 feb 2013 to 31st may 2013 from the case record which included the history taken from the parents, teachers as well as the children. Sample size consisted of 100 patients who attended child guidance clinic of our department on specified days.

Table -1 Sociodemographic Variables of Patients (N =100)

VARIABLE	N	%
AGE (in Years)		
Less than 5	6	6
5-10	49	49
11-15	45	45
SEX		
MALE	69	69
FEMALE	31	31
RELIGION		
Hindu	75	75
Muslim	25	25
DOMECILE		
Rural	67	67
Urban	33	33
FAMILY STRUCTURE		
Joint	85	85
Nuclear	15	15
EDUCATIONAL STATUS		
Illiterate	44	44
I to V	29	29
Above V	27	27

Table 1 depicts the sociodemographic profile of the patients. Highest number of patients (49) belongs to the age group 5-10 years. 45 patients belongs to age group 11-15 years and 6 were of age group less than five years. Sixty nine (69%) were male and thirty one (31%) were females. Majority were hindus (75%). Sixty seven (67%) came from rural background, rest were from urban background. Eighty five of the total 100 patients (85%) lived in joint families and fifteen (15%) in nuclear families. Fourty four (44%) were illiterate and twenty nine (29%) were educated between class group I to V, while twenty seven (27%) were educated above V standard.

TABLE -2 PATTERNS OF PSYCHIATRIC MORBIDITY AT OUR CHILD GUIDANCE CLINIC

DISORDER	MALE	FEMALE	TOTAL	%
Anxiety Disorder				
Dissociative (conversion) disorder	2	3	5	5
Obsessive compulsive disorder	1	0	1	1
Somatoform disorder	0	1	1	1
Adjustment disorder	2	0	2	2
Psychogenic vomiting	2	1	3	3
Sleep terror	1	0	1	1
Trichotillomania	0	2	2	2
Mental Retardation	25	10	35	35
Dyslexia	1	0	1	1
Autism	1	1	2	2
ADHD	12	3	15	15
Tic Disorder	1	0	1	1
Nonorganic Enuresis	5	2	7	7
Pica	1	2	3	3
Stuttering	4	1	5	5
Epilepsy	11	4	15	15
Headache	1	0	1	1

A total of 100 new cases comprising of 69 boys and 31 girls attended the child guidance clinic during the period of the study. 35 (35%) were referred from pediatric outpatient department (OPD), while 65 (65%) were refered by the medical officers. The diagnostic categories of the children as per DSM-IV-TR is given in the table-2.

In the present study mental retardatation was the commonest (n=35; 35%), followed by behavioral disorder attention deficit hyperactive disorder (n=15; 15%), and neurotic, stress related and somatoform disorder (n=10; 10%). Fifteen patients were suffering from neurological disorder like epilepsy (n=15;15%) which reffered to Child guidance clinic.

DISCUSSION

Paucity of cases up to five years of age (Table 1) is not an unusual finding, since the psychiatric structure before the age of four to five years is usually not sufficiently developed to permit internal conflicts of pathological significance and is in agreement with earlier studies in India. The trend is different in western countries where children in preschool periods are also brought to the psychiatric clinic for emotional problems, probably due to identification of the problem by parents. Moreover, in adolescent age group, struggle for self-identity and role differentiation are stressful, thus precipitating such problems. Age related differences in psychiatric problems

have been noted by other workers also. The predominance of males may be explained by the attention and care given to male children by parents. Neuroses, mainly dissociative (conversion) disorder was observed in 10% of the sample.

This is in agreement with earlier studies. It appears that there is a higher prevalence of dissociative (conversion) disorders in South Asian countries as compared to the west. Since the disorder has bodily manifestations, it is brought to medical attention more often. Child rearing is more authoritarian in our country and free verbal expression of emotions in children is not encouraged, therefore expression through conversion into bodily symptom is the only way out left for the child.

The high prevalence of mental retardation in the present sample is due to the mandatory testing of all students before admission to special school for handicapped children or for issue of medical certificates. This finding is consistent with the earlier studies of Shrestha.

In the present study, 15% of patients received a diagnosis of ADHD. Few western studies have reported a high prevalence of up to 50% for ADHD. While a study from Thailand reported low prevalence of 5%. This aspect merits further exploration.

Summary & Conclusion

This present prospective, observational involved all the patients who attended the child guidance clinicat department of psychiatry in our institute during the period 01 feb 2013 to 31st may 2013.

Sample size of this study was 100. sample consisted of patients who attended child guidance clinic of our department on specified days. All the details of patients were filled properly and with great care in semistructured performa designed for the patients. DSM – IV-TR Criteria was used for evaluation and diagnosis of each childhood disorder for the enrolled patients. Findings of this study is summarised as follows:

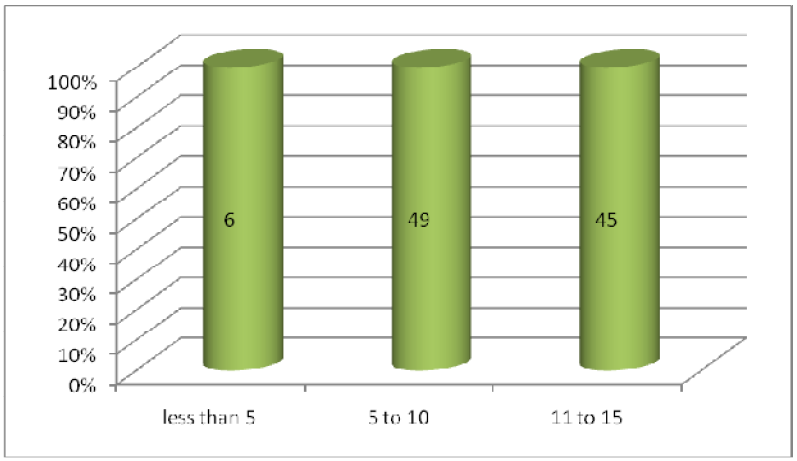
1. Highest number of patients (49) belongs to the age group 5-10 years. 45 patients belongs to age group 11-15 years and 6 were of age group less than five years.
2. Sixty nine (69%) were male and thirty one (31%) were females.
3. Majority were hindus (75%). Sixty seven (67%) came from rural background, rest were from urban background.
4. Eighty five of the total 100 patients (85%) lived in joint families and fifteen (15%) in nuclear families.
5. Fourty four (44%) were illiterate and twenty nine (29%) were educated between class group I to V, while twenty seven (27%) were educated above V standard.
6. In the present study mental retardatation was the commonest (n=35; 35%) disorder.
7. Followed by behavioral disorder, attention deficit hyperactive disorder (n=15; 15%), and neurotic, stress related and somatoform disorder (n=10; 10%).

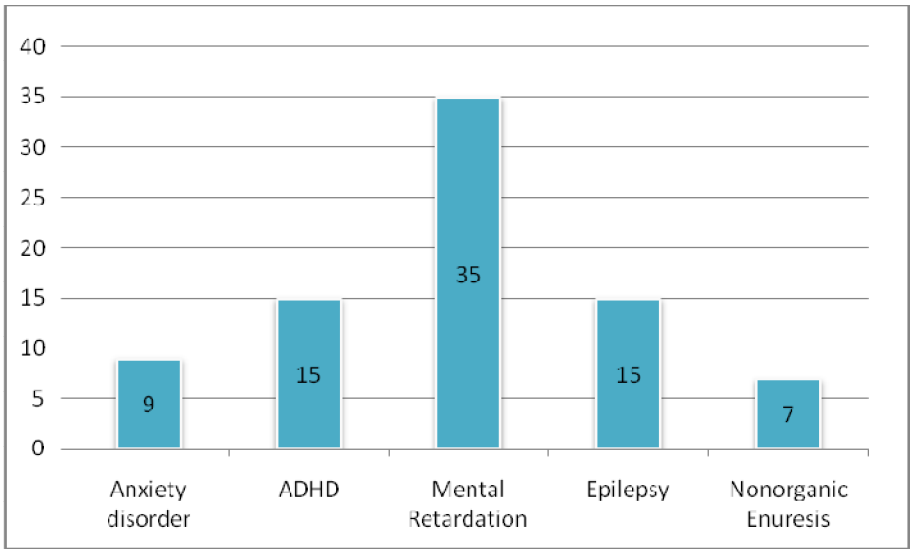
8. Fifteen patients were suffering from neurological disorder like epilepsy (n=15;15%) which reffered to Child guidance clinic.

Limitation:

Limitation of this study are as below:

1. Study comprised small sample size.
2. Duration of study period was short
3. Single centre study that not represent whole scenario of psychiatric disorder





1 sociodempgraphic profile depicting age group of study sample

2 sociodempgraphic profile depicting different psychiatric disorders in study sample

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(13) ANTIOXIDANT STATUS IN PERI-MENOPAUSAL AND POST-MENOPAUSAL WOMEN

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ABSTRACT

BACKGROUND & OBJECTIVES: Menopause is a natural step in the process of ageing and free oxygen radicals have been proposed as important causative agents of ageing. The antioxidant system seems to be affected in post-menopausal women due to deficiency of estrogen, which is a powerful antioxidant. In view of this background, present study was carried out to find correlation between menopause and antioxidant status, if any.

METHODS: Status of antioxidants was determined by spectrophotometric estimation of Superoxide Dismutase (SOD), and Ascorbic Acid in blood/serum of 105 women. The subjects consisted of 35 women of three distinct groups, namely, reproductive age, peri-menopausal, and post-menopausal. Data obtained was analyzed by student's t- test, ANOVA, and Pearson's correlation coefficient (r). $P < 0.05$ was considered significant.

RESULTS: Peri- and post-menopausal women exhibited significantly low erythrocyte SOD and serum ascorbic acid, as compared to the women of reproductive age.

INTERPRETATION & CONCLUSION: Findings of this study corroborate the hypothesis that gradual loss of ovarian function is associated with a concomitant decrease in antioxidant status."

KEY WORDS: ANTIOXIDANTS, ASCORBIC ACID, MENOPAUSE, OXIDATIVE STRESS, SUPEROXIDE DISMUTASE

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INTRODUCTION

The aerobic life-style offers great advantages, but is fraught with danger[1] – as is evident by the fact that accumulation of oxygen-derived free radicals (oxidative stress) is one of the established and thoroughly studied mechanisms of cell injury. Free radicals are responsible for widespread and indiscriminate oxidation and peroxidation of lipids, denaturation of proteins, depolymerization of polysaccharides, breakage and modification of DNA or any other cell structure, causing cell death or organ damage[2].

Antioxidants help to defend the body against free radical attack and human body has got well developed endogenous antioxidant defense system like cellular enzymes and vitamins. Vitamin C forms the first line of antioxidant defence in human plasma exposed to a variety of oxidant insults[3]. A group of antioxidants present in RBC that prevent lipid peroxidation consists of SOD, GPX, catalase and reduced glutathione[4].

Oxidative stress influences the entire reproductive lifespan of a woman and even thereafter i.e. menopause[5]. Menopause is a natural step in the process of ageing and free oxygen radicals have been proposed as important causative agents of ageing[6]. Estrogens have free radical scavenging structures[7] and have been shown to have *in vitro* antioxidant effects on membrane phospholipid peroxidation[8]. The process of ageing is enhanced due to the damage caused by free radicals; hence menopausal women are proposed to develop oxidative stress because of estrogen deficiency and advancing age[9].

In recent years, the medical problems and health care of women have received increasing attention; and several studies have highlighted the alterations in antioxidant status in postmenopausal women. Earlier studies had reported moderately decreased levels of ascorbic acid in postmenopausal women in comparison to healthy controls. However, there is fair measure of ambiguity as regards the effect of menopause on SOD levels. In view of this scientific background, present study was carried out to evaluate the antioxidant status both in peri-menopausal and post-menopausal women as compared to the women of reproductive age. Further, we had attempted to determine that whether the decline in antioxidant status in post-menopausal women is primarily due to the natural process of aging or due to gradual decrease in ovarian function.

MATERIALS & METHODS

This study was conducted in the Department of Physiology, S. M. S. Medical College & attached group of hospitals, Jaipur. The study was conducted on 105 women volunteers, selected from medical & paramedical staff, and healthy attendants of patients. The subjects were categorized into following groups:

Group I: Reproductive age group women (n = 35); normally menstruating women of age 21 – 40 years. This group was further subdivided on the basis of age of the subjects into two sub-groups. This sub-grouping was done to ascertain the effect of ageing alone on the antioxidant status as women of both these sub-groups were menstruating normally.

Sub-Group A: Normally menstruating women of 21 – 30 years, (n=17).
Sub-Group B: Normally menstruating women of 31 – 40 years, (n=18).

Group II: Peri-menopausal women (n = 35); women of the age group 41 – 45 years. Both normally menstruating, and women with some sort of menstrual disorders e.g. irregular menses, menorrhagia, etc. were included in this group; but women experiencing amenorrhea were excluded. (Some authors denote this stage as peri-menopause while others refer it to as pre-menopause.)

Group III: Postmenopausal women (n = 35): women who had at least one year of amenorrhea, and were not receiving hormone replacement therapy; age: 46 – 50 years.

All subjects were screened for their general and medical history, especially menstrual and reproductive. The subjects suffering from hypertension, cardiovascular diseases, diabetes, venereal diseases and/or showing any pathology (including carcinoma) were excluded from the study. Women taking oral contraceptives, antioxidants or any other drug were also excluded from the study. Clinical examination was carried out with the aid and advice of a competent gynaecologist. Using aseptic techniques, 5 ml venous blood was drawn from the antecubital vein of the volunteers after informed consent. We evaluated the status of an enzymatic antioxidant – superoxide dismutase (SOD), and a non-enzymatic antioxidant – ascorbic acid (Vitamin C) in the blood/sera of the subjects to find out the correlation, if any, between menopause and level of antioxidants.

SUPEROXIDE DISMUTASE [SOD] ESTIMATION

Ransod kit, manufactured by Randox Lab. Ltd, was used for the estimation of SOD activity in the erythrocytes. 0.5 mL of whole blood was centrifuged for 10 minutes at 3000 rpm, and the plasma was aspirated off. Erythrocytes were washed four times with 3.0 mL of 0.9% NaCl solution and were centrifuged for 10 minutes at 3000 rpm after each wash. Lysate was prepared by suitable dilution with cold redistilled water and was further diluted with 0.01 mol/L phosphate buffer (pH 7.0). Thus prepared samples and standards were used for the estimation of SOD activity in U/mL by the following procedure. 0.05 mL of prepared standard/sample was added to 1.7 mL of mixed substrate and mixed well. Then, 0.25 mL of xanthine oxidase was added to the above mixture and mixed well. Absorbance was measured on a spectrophotometer at 505 nm at 37°C against air. Rate of reaction was determined by measuring initial absorbance (A_1) after 30 seconds and the final absorbance (A_2) after 3 minutes of measuring A_1. As the reaction of Sample diluent (S1: 0.0 U/mL) was uninhibited, therefore its rate was deemed to be 100%. To calculate % inhibition of other standards/samples, their rates were converted into percentages of the sample diluent rate, and subtracted from 100%. A curve was plotted between percentage inhibition of each standard against Log_{10} (standard conc. in SOD U/mL). Percentage inhibition of sample was used to obtain Log_{10} (sample conc. in SOD U/mL) values from the standard curve and antilogarithms were taken of the values obtained by the curve to obtain sample conc. in SOD U/mL[10].

ASCORBIC ACID ESTIMATION

Serum ascorbic acid was estimated by the method reported by Natelson S and Natelson EA, 1980[11]. 0.2 ml of serum was added to 0.8 ml of 10% TCA and mixed well. Tubes were allowed to stand for 5 minutes and were centrifuged at 2000 rpm. 0.5 ml of supernatant was transferred to a small test tube and 0.2 ml of DNPH reagent was added. Tubes were

stoppered and incubated at 37°C for 3 hours. Tubes were then chilled on ice-bath and 0.8 ml of cold 65% H_2SO_4 was added, and mixed well. Tubes were allowed to stand for 30 minutes at R.T. Blank comprised of 0.5% TCA, treated as for serum. Standard comprised of the 1.0 mg/dl ascorbic acid. Absorbance was read against the blank at 520 nm on a spectrophotometer.

STATISTICAL ANALYSIS

Data obtained for various parameters was subjected to statistical analysis. Arithmetic means and standard deviations were calculated to compute 't values' (student's t- test). ANOVA test (analysis of variance) was also employed and 'F values' (Fischer's test) were calculated. On the basis of t and F values 'P' (probability) was determined to establish the significance of variance of individual parameters among the various groups studied. $P < 0.05$ was considered significant for all tests[12].

RESULTS

Mean values of the parameters studied are presented in table: 1, and the significance of difference computed by student's t test, between the various groups of the subjects is depicted in table: 2. Superoxide dismutase levels were found to be low in both peri-menopausal women and post-menopausal women in comparison to women of reproductive age. The decrease was, however, more marked in post-menopausal women. Further, difference between SOD levels of women of reproductive age and post-menopausal women was statistically significant while that between women of reproductive age women and pre-menopausal women was not significant. Similarly, peri-menopausal and post-menopausal women differed insignificantly in this regard.

TABLE 1: SOD and Ascorbic Acid Values (Mean ± S.D.) of various groups of the subjects

Parameters	Groups		
	Reproductive Age Women	Peri-Menopausal Women	Post-Menopausal Women
SOD (U/mL)	179.56 ± 82.69	155.84 ± 57.48	139.15 ± 54.31
Ascobic Acid (mg/dL)	1.01 ± 0.24	0.90 ± 0.19	0.79 ± 0.22

TABLE 2: SOD and Ascorbic Acid Values Compared across the three groups of subjects studied

Parameters	Groups Compared		
	Rep. Age v/s Peri-Meno	Rep. Age v/s Post-Meno	Peri-Meno v/s Post-Meno
SOD (U/mL)	> 0.05	< 0.05*	> 0.05
Ascobic Acid (mg/dL)	< 0.05*	< 0.001*	> 0.05

* Significant

Serum ascorbic acid levels were also significantly decreased in peri-menopausal and post-menopausal women in comparison to those observed in women of reproductive age. Post-menopausal women exhibited lowest ascorbic acid levels. Non-significant variation was observed in pre-menopausal and post-menopausal women.

Analysis of variance (ANOVA) showed that - within group variations, of parameters studied, were significantly less in comparison to the inter-group differences, as depicted in table no.: 3. These findings reaffirm the significance of variance deduced by student's t test and indicate that the subjects of the three groups possess some sort of intra-group uniformity in regard to the antioxidant levels, apart from the similarities arising out of menstrual behaviour. Moreover, a positive and significant correlation was observed between the two antioxidants studied, as illustrated by figure: 1.

Table 3: Analysis of Variance (ANOVA) in the parameter s studied

Parameter	F Value	P Value
SOD	5.56	< 0.05*
Ascorbic Acid	5.86	< 0.05*

* Significant

Fig. 1: Correlation between SOD and Ascorbic Acid Levels of all the subjects

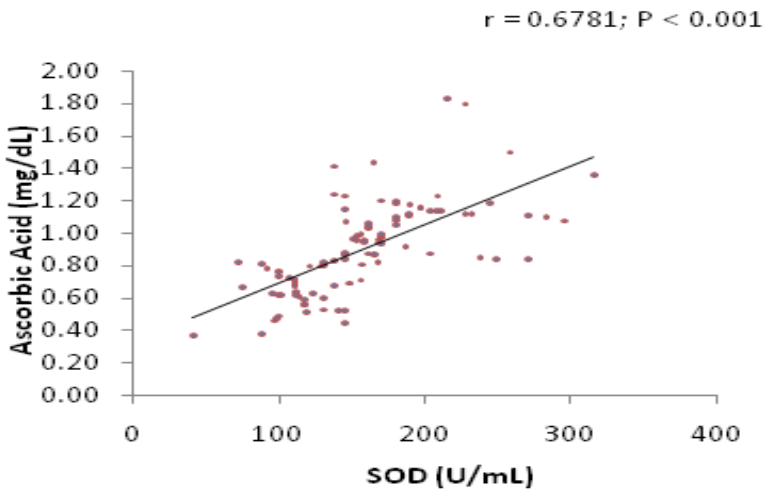

Table 4 depicts the mean values of SOD and Ascorbic acid in the two sub-groups of women of reproductive age. Although there was a difference of almost 10 years in the mean age of the subjects of the two sub-groups, yet no significant difference was observed in either SOD or Ascorbic acid levels of the two sub-groups.

Table 4: SOD and Ascorbic Acid Values in two sub-groups of Reproductive Age Women

Parameters	Reproductive Age Women Sub Groups		P Value
	A	B	
	21 – 30 years (n=17)	31 – 40 years (n=18)	
SOD (U/mL)	184.30 ± 76.79	175.09 ± 83.42	> 0.05
Ascorbic Acid (mg/dL)	0.99 ± 0.18	1.02 ± 0.27	> 0.05

DISCUSSION

Various studies conducted by different authors, exhibit a fair measure of ambiguity with regard to the effect of menopause on SOD levels. Shrivastava V *et al* reported that post-menopausal women had significantly lower concentrations of SOD in comparison to pre-menopausal women[9]. Krstevska M *et al* observed that SOD levels were decreased in peri-menopausal and post-menopausal women as compared with normally menstruating women; however, the variations were statistically non-significant[13]. Bednarek-Tupikowska G *et al* stated that SOD activity did not differ between pre-menopausal and post-menopausal women[14]. However, Gurdol F *et al* found increased SOD activity in menopausal women, but only at an older age[15].

Relatively few studies have been conducted on the association of menopause and serum ascorbic acid concentration; however, studies reviewed for this study indicate that post-menopausal women exhibit lower serum ascorbic acid levels. Oner P *et al* found mean leukocyte and plasma ascorbate values in postmenopausal women significantly less but within acceptable ranges as compared to normally menstruating women[16]. According to these observations, plasma and leukocyte ascorbic acid concentrations decreased after the cessation of ovarian hormone production. Vural P *et al* also reported a significant decrease in plasma ascorbic acid in postmenopausal women, in comparison to healthy control women[17].

Mean ages of women of reproductive age, pre-menopausal women and post-menopausal women were 30.74 ± 5.72 years, 43.06 ± 1.49 years and 47.91 ± 1.40 years respectively. As subjects of the three groups were of different age groups, it is qualified to doubt that the differences observed among these groups may be due to differences in the age of the subjects because increased oxidative stress is an attribute of ageing. Since ovarian dysfunction and menopause are also implications of ageing, so to evaluate general increase in oxidative stress due to ageing - women of reproductive age were divided into two sub-groups i.e. sub-group A including women of 21–30 years while sub-group B comprising women of 31–40 years. The mean age of sub-group A was 25.76 ± 3.01 years, while that of sub-group B was 35.44 ± 2.94 years. However, no significant variation was observed between the two sub-groups of reproductive age women, in any of the analytes (Table: 4); in spite of difference of ten years in the mean age of subjects of the two sub-groups. Therefore, the decreased levels of antioxidants in post menopausal women as compared to the peri-menopausal women cannot be attributed to ageing alone; the difference in mean age of the subjects of the two groups being less than five years.

Women with proper ovarian function (reproductive age) exhibited highest values of SOD and ascorbic acid, intermediate values of the two antioxidants studied were represented by women with mild ovarian dysfunction (peri-menopausal) while the lowest levels of SOD and ascorbic acid were observed in women suffering from ovarian dysfunction (post-menopausal).

This order indicates that ovarian dysfunction may be responsible for the decreased antioxidant staus evident in peri-menopausal women and, more remarkably, in post-menopausal women.

CONCLUSION

Findings of this study corroborate the hypothesis that gradual loss of ovarian function is associated with a concomitant rise in oxidative stress as exhibited both by decreased levels of antioxidants in peri-, and post-menopausal women.

We suggest further studies on this issue which may involve larger sample size, additional parameters, and may also look into the nutritional aspects especially in reference to non-enzymatic anti-oxidants, so that the intricate relationship between menopause and oxidative stress is understood more clearly and such knowledge may contribute in attenuation of distress caused by menopause to half of the world's population.

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(14) STUDY OF LIPID PROFILE IN BELOW AND ABOVE THE 45 YEARS OF AGE GROUPS OF MALE AND FEMALE

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ABSTRACT:

INTRODUCTION: Atherosclerosis of the coronary artery disease is the most common cause of myocardial ischemia. Many large scale analyses have demonstrated a nearly linear correlation between the total cholesterol and low density lipoprotein (LDL) cholesterol and the severity of atherosclerosis. It has also been seen the inverse relationship between symptomatic atherosclerosis and the high density lipoprotein (HDL) cholesterol level.

OBJECTIVE: The goal of our study to estimate total cholesterol, HDL and LDL level in below and above the 45 years of age groups of male and female.

METHOD: 20 male and 20 female are below the 45 years of age and 20 male and 20 female above the 45 years of age. The entire subject were instructed about study and written consent taken. History and clinical examination was done.
Blood from vein is drawn for estimation of total cholesterol, HDL cholesterol and LDL cholesterol. Total serum cholesterol, serum LDL cholesterol and serum HDL cholesterol level is estimated in biochemistry laboratory by calorimetric method. Statistical analysis was done by unpaired t test. P value less than 0.05 considered as a significant.

RESULTS:
Total cholesterol level is significantly ($p < 0.001$) higher in above 45 years male and female than below 45 years of male and female. HDL cholesterol level is not significantly ($p > 0.05$) change in below and above 45 years of male. LDL cholesterol level is significantly ($p < 0.001$) higher in above 45 years of male and female than below 45 years of male and female. HDL cholesterol level is significantly ($p < 0.001$) higher in above 45 years of female than below 45 years of female. Male have higher LDL cholesterol level than female in both the age groups.

CONCLUSION:
Total cholesterol level and LDL cholesterol level are significantly ($p < 0.001$) higher in above 45 years male and female than below 45 years of male and female. HDL cholesterol level is significantly ($p < 0.001$) higher in above 45 years of female than below 45 years of female but HDL cholesterol level is not significantly ($p > 0.05$) change in below and above 45 years of male.

KEY WORDS: Atherosclerosis lipoprotein LDL

Cholesterol HDL myocardial ischemia

MAIN ARTICLE

INTRODUCTION:

In 1951, Barr et al has documented the negative association between high density lipoprotein (HDL) and ischemic heart disease (4). It was not realized and considered seriously till 1975 when Miller and Miller put forward their "HDL hypothesis" they proposed that high density lipoprotein (HDL) serves as carrier function clearing cholesterol from arterial tissue and transporting to the liver for catabolism and excretion (5, 7). HDL cholesterol is known as "good" cholesterol because it seems to protect against heart attack (Low HDL below 40 mg/dl increase the risk of heart disease) (1, 6).

Medical expert think that HDL tends to carry cholesterol away from the arteries and back to the liver, where it's passed from the body. Some expert believed that HDL removes excess cholesterol from plaque in arteries, thus slowing the build up (2, 5). The risk of coronary heart disease rises as blood cholesterol level increase. A person at level 240 mg/dl of total cholesterol and above have more than twice the risk of heart disease as someone whose cholesterol level is below 200 mg/dl (3).

If patient do not have coronary heart disease or diabetes LDL goal is <160 mg/dl. If there is no coronary heart disease or diabetes and have two or more risk factors LDL goal is less than 130 mg/dl (1, 8). If coronary heart disease or diabetes are present LDL goal is < 100 mg/dl. NCEP (National Cholesterol Education Programme) Guideline = HDL < 40 mg/dl as low, implying as increased risk of CVD.

MATERIALS AND METHODS:

Present study was carried out in 40 male and 40 female. Out of which 20 male and 20 female were below 45 years of age and 20 male and 20 female were above 45 years of age.

Experimental protocol was explained and consent was taken.

History was taken and clinical examination (general and systemic) done for inclusion and exclusion criteria.

- Inclusion criteria:

1) Male and Female with age group of below and above the 45 years.
2) Healthy individual without any known disease.
3) No history of drug, blood transfusion or any condition that affect blood cell count.

- Exclusion criteria :

1) Individual with any known general or systemic disease.
2) Any history of drug or medication that affect blood cell count.
3) Female with pregnancy and menstrual period.
4) Any un co-operative individual.

- Experimental protocol :

1) All the subjects filled the consent form that they are willing to participate in the study.
2) History and clinical examination was done for inclusion and exclusion criteria.
3) Subject's total serum cholesterol, serum LDL cholesterol and serum HDL cholesterol level is estimated in biochemistry laboratory by calorimetric method.
4) Then mean value and standard deviation was estimated by statistical method.

STATISTICAL ANALYSIS:

Unpaired t test is used for analysis and P value less than 0.05 consider as a significant.

RESULTS:

Total cholesterol level is significantly ($p < 0.001$) higher in above 45 years male and female than below 45 years of male and female. HDL cholesterol level is not significantly ($p > 0.05$) change in below and above 45 years of male. LDL cholesterol level is significantly ($p < 0.001$) higher in above 45 years of male and female than below 45 years of male and female. HDL cholesterol level is significantly ($p < 0.001$) higher in above 45 years of female than below 45 years of female. Male have higher LDL cholesterol level than female in both the age groups.

TABLE 1: Total cholesterol, HDL cholesterol and LDL cholesterol in above and below the 45 years of male:

Parameters	<45 years	>45 years	Significance
Total cholesterol (mg/dl)	184.40 ± 10.59	223.15 ± 27.15	S
HDL cholesterol (mg/dl)	46.75 ± 3.90	46.90 ± 3.94	NS
LDL cholesterol (mg/dl)	124.46 ± 15.53	152.25 ± 19.85	S

TABLE 2: Total cholesterol, HDL cholesterol and LDL cholesterol in above and below the 45 years of female:

Parameters	<45 years	>45 years	Significance
Total cholesterol (mg/dl)	163.00 ± 7.99	211.20 ± 27.43	S
HDL cholesterol (mg/dl)	54.05 ± 2.16	57.10 ± 2.21	S
LDL cholesterol (mg/dl)	97.05 ± 7.02	128.20 ± 22.07	S

Data presented are Mean $\pm$ SD (standard deviation)
NS: not significant ($P>0.05$)
S: significant ($P <0.05$)

DISCUSSION:

In our study, the women below age group of 45 years were having significantly ($p<0.001$) lower serum total cholesterol level than men of same groups. But after 45 years of age women showed a sharp rise in its level. In this age group the difference in the serum total cholesterol level in men and women both were not significant ($p>0.05$).

In male, HDL cholesterol level is the same in both age groups under study. But, in female, there was significant ($p <0.001$) increase in its serum level. The age effect on serum HDL in case of male and female both in our study was in accordance with Heiss et al (1980) and report of American Heart Association June 5, 2004. A failure to detect a decrease in HDL levels in women at ages after menopause argues against a major influence of estrogen levels in older adult women (2, 5). A gonadotropin effect on HDL may be responsible for maintenance of HDL.

In our study LDL cholesterol in both sexes increased with ages. Male have higher LDL cholesterol level than female in both the age groups. HDL cholesterol is known to have a protective role in formation of atherosclerosis also known as “Cardio protective cholesterol” (7, 8). What is more disturbing is that in India, coronary artery disease occurs at a younger age group and the atheroma is more extensive (3, 6).

CONCLUSION:

Total cholesterol level and LDL cholesterol level are significantly ($p < 0.001$) higher in above 45 years male and female than below 45 years of male and female. HDL cholesterol level is significantly ($p < 0.001$) higher in above 45 years of female than below 45 years of female but HDL cholesterol level is not significantly ($p > 0.05$) change in below and above 45 years of male.

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(15) ASSOCIATION BETWEEN ABO BLOOD GROUP AND RHEUMATIC HEART DISEASE

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ABSTRACT:

INTRODUCTION: *Now a day, heart disease is the leading cause of morbidity and mortality in the industrialized nations. From an epidemiological point of view Rheumatic fever and Rheumatic heart disease cannot be separated. Both of them are a major cardiac cause of disability and death. The onset of Rheumatic fever is usually preceded by a Streptococcal sore throat caused by Group-A Streptococcus one to four weeks earlier. Attempts have been made to correlate the occurrence of rheumatic fever and Rheumatic heart disease with genetically determined red blood cell groups, particularly ABO system. . Clarke had shown statistically significant association between Rheumatic disease and blood groups.*

OBJECTIVE: *Goal of our study to observe the association between ABO blood group and rheumatic heart disease.*

METHOD: *120 cases of Rheumatic heart disease patients taken. 2500 controls of ABO blood groups taken. The entire subject were instructed about study and written consent taken. History and clinical examination was done.*

The selection of cases of Rheumatic fever was made by Jones's Criteria. Blood from vein is drawn for estimation of ABO blood group and for diagnosis of rheumatic heart disease. Statistical analysis was done by chi-square test. P value less than 0.05 considered as a significant.

RESULT: *Out of 120 cases, 36 patients were of group 'A' (30.00%), 46 patients were of group 'B' (38.33%), 27 were of group 'O' (22.50%) and 11 cases were of group 'AB' (9.17%). In control cases, 37.08% belongs to group 'B', 33.08% to blood group 'O'. 21.48% to blood group 'A' and only 8.36% to AB. Its comparison with control series revealed that there was an apparently increased frequency of disease in the 'A', 'B' and 'AB' blood group and a decrease in blood group 'O'. There is increased incidence in blood group 'A' and low incidence in Blood group 'O'. This chi-square value revealed and it is significant [P value between 0.05 and 0.02 i.e. < 0.05 and Degree of freedom (D.F.) = 3].*

CONCLUSION: *It is concluded therefore that, group 'A' individuals are more susceptible to rheumatic heart disease while group 'O' individuals are relatively resistant to the disease.*

KEY WORDS: Rheumatic fever Streptococcus ABO system Sore throat Rheumatic heart disease

MAIN ARTICLE

INTRODUCTION:

Several studies show that the environmental, bacterial and host factors apparently play its role in the development of Rheumatic fever. There is growing body of evidence to suggest that there is genetic constitution or rheumatic constitution, which expresses itself in the form of hypersensitivity or auto-immune response to invasion of Streptococcus (3.7). Khattab and Ismail (1960) and Buckwalter (1962) who have found an increased incidence of rheumatic fever in persons of blood group 'A' and a significant decrease of the disease in persons of group 'O'(2,10).

The existence of serological differences between individuals was first described by Landsteiner (1901) at the turn of century. He classified people into one of the four groups, depending on whether their red cells contained 'agglutinogen A', 'agglutinogen B' neither A or nor B (O) or both A and B (AB). In India, Rheumatic heart disease account for 33-50% of all cardiac death and over six million children are affected by the disease (4,9).

Rheumatic fever occurs at all ages, except infancy, but incidence peaks between 5-15 years, a period when Streptococcal infections are most frequent (1,5). The disease occurs with about equal frequency in both sexes with no significant racial productivity. Glynn and Halborow (1952, 1961) postulated that Streptococci possibly convert the blood group substances secreted in saliva to antigens, which led to the causation of Rheumatic fever (6).

MATERIALS AND METHODS:

120 cases of Rheumatic heart disease patients taken. 2500 controls of ABO blood groups taken.

Experimental protocol was explained and consent was taken.
History was taken and clinical examination (general and systemic) done for inclusion and exclusion criteria.

- Inclusion criteria:

4) Male and Female both are included.
5) No history of drug, blood transfusion or any condition that affect blood cell count.

- Exclusion criteria :

5) Controls with any known general or systemic disease.
6) Any history of drug or medication that affect blood cell count.
7) Female with pregnancy and menstrual period.
8) Any un co-operative individual.

- Experimental protocol :

5) All the subjects filled the consent form that they are willing to participate in the study.
6) History and clinical examination was done for inclusion and exclusion criteria.
7) Blood from vein is drawn for estimation of ABO blood group and for diagnosis of rheumatic heart disease.
8) The selection of cases of Rheumatic fever was made by Jones's Criteria:

(A) MAJOR CRITERIA:
Carditis
Polyarthritis
Chorea
Erythema marginatum
Subcutaneous nodules

(B) MINOR CRITERIA:
(a) Clinical findings:
Fever
Arthralgia
(b) Laboratory findings:
Increased ESR
Increased acute phase reactant
Increased C reactive protein
Prolonged PR interval on ECG.

Supporting Evidence of Antecedent Group A Streptococcus Infection :

- Positive throat culture
- Rapid Streptococcus antigen test.
- Elevated or Rising Streptococcus Antibody titre.

If supported by evidence of preceding Group A Streptococcal infection, the presence of two minor manifestations or of one major and two minor manifestations indicate a high probability of acute Rheumatic fever.

9) Statistical analysis was done by chi-square test.

STATISTICAL ANALYSIS:

Statistical analysis was done by chi-square test. P value less than 0.05 considered as a significant.

RESULT:

Out of 120 cases, 36 patients were of group 'A' (30.00%), 46 patients were of group 'B' (38.33%), 27 were of group 'O' (22.50%) and 11 cases were of group 'AB' (9.17%). In control cases, 37.08% belongs to group 'B', 33.08% to blood group 'O'. 21.48% to blood group 'A' and only 8.36% to AB. Its comparison with control series revealed that there was an apparently increased frequency of disease in the 'A', 'B' and 'AB' blood group and a decrease in blood group 'O'. There is increased incidence in blood group 'A' and low incidence in Blood group 'O'. This chi-square value revealed and it is significant [P value between 0.05 and 0.02 i.e. < 0.05 and Degree of freedom (D.F.) = 3].

TABLE 1: Percentage distribution of ABO blood groups in controls and patients of rheumatic heart disease.

	A	B	0	AB
Control	21.48	37.08	33.08	8.36
Rheumatic heart disease	30.00	38.00	22.50	9.17
Difference	+8.52	+1.25	-10.58	+0.81

TABLE 2: The computed distribution of two groups on the hypothesis of no significance (Expected values).

	A	B	0	AB
Control (2500)	547	928	815	210
Rheumatic heart disease (120)	26	45	39	10

TABLE 3: Showing the relative incidence based upon blood group frequencies in rheumatic heart patients and control.

Compared blood groups	Relative incidence	Chi-square	Degree of freedom	Probability	% of probability being significant

Group A to O	1.99	8.39	1	0.005	Highly significant
Group B to O	1.49	2.81	1	0.1	90%
Group AB to O	1.58	1.48	1	0.34	66%
Group Non-O to O	1.66	5.73	1	0.02	Highly significant

DISCUSSION:

In the present work the study was made on 120 cases of rheumatic heart disease and their blood group was analysed. Out of 120 cases, 36 patients were of group 'A' (30.00%), 46 patients were of group 'B' (38.33%), 27 were of group 'O' (22.50%) and 11 cases were of group 'AB' (9.17%). Its comparison with control series revealed that there was an apparently increased frequency of disease in the 'A', 'B' and 'AB' blood group and a decrease in blood group 'O'. Chi-square x^2 method for such analysis and it was found that there is increased incidence in blood group 'A' and low incidence in Blood group 'O'.

Rheumatic fever follows infection of upper respiratory tract with group 'A' Streptococcus which was found as early as 1900 by Poyton and Payne, Collis (1931) also found the Streptococcus haemolytics Group 'A is containing related to the etiopathogenesis of rheumatic fever (2,8). For group 'a' to O the X^2 value 8.39 was found to give a probability (P) – 0.005 which is highly significant. The relatively low incidence of Rheumatic heart disease in group 'O' persons was again tested for significance by comparing collectively non 'O' to group 'O'. The relative incidence of group non 'O' to 'O' was found to 1.66 that means that group non 'O' persons are 1.66 times more prone to develop Rheumatic heart disease and the X^2 value 5.73 with D.F. = 1 gives a probability to 0.02 which is again highly significant.

In control cases, 37.08% belongs to group 'B', 33.08% to blood group 'O'. 21.48% to blood group 'A' and only 8.36% to AB. The distribution of Blood group in 120 test cases were observed as 38.33% belongs to blood group 'B', 30.00% to group 'A', 22.50% to group 'O' and only 9.17% to blood group 'AB'. The outstanding differences in the incidence of Rheumatic heart disease in blood group 'B' and 'A' was found to be statistically significant. It was more significant when incidence in blood group 'O' was compared with that of non 'O' blood group (p value = 0.02).

CONCLUSION:

It is concluded therefore that, group 'A' individuals are more susceptible to rheumatic heart disease while group 'O' individuals are relatively resistant to the disease.

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(16) Review Article

PHYSIOLOGICAL IMPORTANCE OF OSTEOPONTIN

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ABSTRACT

Osteopontin a recently discovered ubiquitous glycoprotein secreted from various cells of the body. It has been found to anchor to bone cells to mineralize the bone matrix. As per some researches its uropontin form has shown to reduce growth of calcium crystals in the mice renal system; yet others suggest opposite role of this molecule in- vitro. Its modified form has great functional role in immune system by acting as a modulator in variety of manners other than regulating apoptosis. It plays important role in immigration of neutrophil and migration and degranulation of the mast cells. Its role in VSMC growth has well been demonstrated by various in-vivo and in- vitro experiments. Its versatile importance in respiratory physiology, cancer metastasis has been proved but many more physiological and clinical functions are still hidden which researchers are trying to find out for the treatment modality in near future.

KEYWORDS: Osteopontin, Immune system, Vascular smooth muscle cell growth

INTRODUCTION

Over last one decade many new important small molecules have been discovered. These molecules have different physiological role to play in our body. Their deficiency or absence will lead us into a pathological state. Out of all these new up coming components the one with diverse presence and different physiological role to play in body is Osteopontin (OPN). Osteopontin is acidic, phosphorylated sialic acid rich calcium binding 314 amino acid glycoprotein found in body fluids [1] and extracellular matrix component first identified in 1986 in Osteoblast cell by Oldberg et. Al., [2]

The human gene mapped for this small glycoprotein is on chromosomes 4q. Its receptor protein contains an Arg-Gly-Asp sequence which serves as a cell adhesion sequence that recognizes various integrins[3]. It is synthesized not only by fibroblast[4] , proosteoblasts, osteoblasts or osteoclastic cell in bone but also are found in kidney, expressed in the bone marrow derived granulated metrial gland cells of the decidum and placenta and in number of specialized epithelial tissues which includes uterine epithetlial, sensory epithelial of the embryonic ear, smooth muscle cells[5], skeletal muscle myoblasts[6], dendritic cells and macrophages[7], other than hypertrophied chondrocytes and odontoblasts.

It has been proved experimentally that hypocalcemia and hypophosphatemia (instances that stimulates kidney's proximal tubule cells to produce calcitriol i.e., 1α, 25-dihydroxy vitamin D3) leads to increase OPN transcription, translation and secretion[8]. This is due to presence of a high-specificity VitaminD response element (VDRE) in the OPN gene promoter. Extracellular inorganic phosphate (ePi) has also been identified as a modulator of OPN expression [9].

Physiological function in Bone Remodeling:

OPN plays a role in anchoring osteoclasts to the mineral matrix of the bone[10]. 20% of dry weight of organic part of the bone has collagen Type I, osteocalcin, osteonectin bone sialoprotein and alkaline phosphatase other than OPN.

OPN serves to initiate the process by which osteoclasts develop their ruffled borders to begin bone resorption [10]. Since it is a product of cells in the osteoid matrix and can form a bridge (Latin Pons) between cells and the mineral[2] in the matrix, it was named "Osteopontin".

Role in inhibiting or promoting Renal Stone formation:

The majority of the human urinary stones are primarily composed of calcium salts. Although normal urine is frequently supersaturated with respect to calcium oxalate, most individuals do not form stones. This suggests that there are some factors inhibiting urinary stone formation.

Uropontin, the urinary form of OPN has been shown previously to reduce growth[11] and aggregation[12] of calcium oxalate crystals and block the binding of the crystals to renal epithelial cells[13].

Uropontin inhibits calcium oxalate monohydrate (COM) growth and aggregation. In addition OPN also favors formation of calcium oxalate dehydrate (COD) over COM crystals in vitro. COD is less adherent to renal epithelial cells than COM[14].

Some reports suggest that OPN plays an important role in the process of stone formation. In vitro, the 45Ca concentration in calcium oxalate crystals adhering to Madin- Darby canine kidney (MDCK) cells was about 1.4 times in MDCK cells incubated with OPN than in a control group, and was about one half that in MDCK cells incubated with thrombin than in the control group[15].

Role in Immune function:

Full length OPN (OPN-FL) can be modified by thrombin cleavage, which exposes acryptic sequence, SVVYGLR on the cleaved form of the protein known as OPN-R.This cleaved OPN exposes an epitope for integrin receptors of α4β1, α9β4 and α9β1[16] and these receptors are

present on a number of immune cells such as mast cells[10], neutrophils[17] and T cells. They are also expressed by monocytes and macrophages[18].

OPN is reported to act as an immune modulator in a variety of manners[3]. Firstly, it has a chemotactic property, which promotes cells recruitment to inflammatory sites. It also functions as an adhesion protein, involved in cell attachment and wound healing. In addition, OPN mediates cell activation and cytokine production.It is well known from promoting cells survival by regulating apoptosis[3].

OPN is important for the immigration of neutrophil in –vitro[19]. OPN recruits inflammatory cells to arthritis joints in the collagen- induced arthritis model of rheumatoid arthritis[20]. It has been found that OPN plays a role in mast cell migration and its degranulation[21] by observing decreased level of chemotaxis in the cells which were OPN knock- out mast cells compared to wild type mast cells in culture medium. OPN was also found to act as a macrophage chemotactic factor[22]. In this study, researchers looked at the accumulation of macrophage in the brain of Rhesus monkeys and found that OPN prevented macrophage from leaving the accumulation site, indicating an increased level of chemotaxis.

Cell activation:

OPN inhibits production of Th2 cytokine IL-10, which leads to enhanced Th1 response. OPN influences cell- mediated immunity and has Th1 cytokine function. It also enhances B cell immunoglobin production and proliferation[3.]

Apoptosis:

OPN is an important anti-apoptotic factor in many circumstances. It blocks the activation – induced cell death of macrophage and T cells as well as fibroblasts and endothelial cells exposed to harmful stimuli[23,24]. OPN prevents non programmed cell death in inflammatory colitis[25].

Role in Vascular smooth muscle cell VSMC Remodeling:

OPN is a matrix molecule and its expression is dramatically increased by Angiotensin II. OPN has been shown to exert important effect on VSMC growth[26]

Remodeling process of VSMC is increased at mRNA and protein levels after addition of Angiotensin II to rats' cardiac fibroblasts. This suggests that ANF II regulates cardiac fibroblast behavior in cardiac remodeling process thus suggesting that OPN contributes directly to contractile dysfunction seen in the model and in the blood pressure independence[27].

OPN induces both medial thickening without injury and neointimal formation after injury suggesting acertain role in the development of vascular remodeling after angioplasty in –vivo[28]. This small molecule is one of the most hightly induced proteins at sites of epithelial injury[29]. OPN appears to specifically promote early inflammatory mechanisms associated with macrophage recruitment in atheroscleorotic lesions[30].

Role in muscular regeneration:

It has been shown by a study that myoblast cells release osteopontin to assist in controlling both the myogenic and inflammatory processes during the early stages of muscle regeneration[31].

Role in respiratory system:

OPN being a cytokine component which upregulated epithelial cells and macrophage in the lungs during chronic allergen challenge and airway remodeling. The data reveals it is a novel therapeutic target for airway remodeling and associated airway hyper-responsiveness (AHR) in chronic asthama[32].

Clinical application:

OPN interacts with multiple cell surface receptors which are ubiquitously expressed making it an active player in many physiological and pathological processes; like in wound healing, bone turnover, ischemia, immune responses and tumorgenesis. By manipulating plasma OPN levels its

usefulness in the treatment of autoimmune disease like Rheumotoid arthritis, multiple sclerosis, cancer metastasis, osteoporosis and some stress forms might be possible[2].
Research is still going on regarding Osteopontins' physiological, pathological and clinical abilities.

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