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Editorial

"Zika Fever"

Prof. Dr. Parimal Chandra Sarker

Zika fever, also known as Zika virus disease or simply Zika, is an infectious disease caused by the Zika virus and mostly produces no symptoms, but some cases mild symptoms resemble to dengue fever. Symptoms may include fever, red eyes, joint pain, headache, and a maculopapular rash and generally persist up to seven days[1]. Zika virus is a member of Flaviridae family and its name comes from the Ziika forest in Uganda, where the virus was first isolated in 1947. This virus shares a genus with the Dengue, Yellow fever, Japanes encephalitis and West Nile virus[2]. It is spread by Ades mosquitoes, such as A.aegypti and A.albopictus and can also be transmitted through sexual contact or blood transfusion[3]. Mother-to-child transmission during pregnancy can cause microcephaly and other brain malformations in some babies[4]. Infections in adults have been linked to Guillain – Barre syndrome(GBS)[5].

Since the 1950s, Zika fever occur within a narrow equatorial belt from Africa to Asia then from 2007 to 2016, the virus spread eastward, across the Pacific Ocean to the Americas, leading to the Zika virus epidemic (2015–2016) and also occurring in Tanzania as of 2016[6,7]. Between August and November 2016, 455 cases of Zika virus infection were confirmed in Singapore[8]. On 22 March 2016, Reuters reported that Zika was isolated from an elderly man in Chittagong in Bangladesh as part of a retrospective study[9]. In 2021, Indian state of Kerala reported cases of Zika virus infection for the first time in the country. Total 19 Number of Positive cases sent to National Institute of Virology (NIV) for testing[10].

Zika virus replicates in the mosquito's mid-gut epithelial cells and then in salivary gland. After 5–10 days, the virus can be found in the mosquito's saliva. During biting saliva is inoculated into human skin then the virus can infect epidermal keratinocytes, skin fibroblasts and the Langerhans cells[11]. The pathogenesis of the virus is hypothesized to continue with a spread to lymph nodes and blood stream. Flaviviruses replicate in the cytoplasm, but Zika antigens have been found in infected cell nuclei[12]. The viral protein numbered NS4A can lead infection involves in the primary neural stem cells of the fetal brain, known as neural progenitor cells[13]. The main roles of brain stem cells are to proliferate until the correct number is achieved, and then to produce neurons through the process of neurogenesis[14]. Zika proteins NS4A and NS4B have also been shown to directly suppress neurogenesis. Infection of brain stem cells can cause cell death, which reduces the production of future neurons and leads to a smaller brain (microcephaly)[15]. Zika also appears to have an equal tropism for cells of the developing eye, leading to high rates of eye abnormalities as well[13,14]. There is some evidence that Zika virus may directly or indirectly interfere with mitotic function, this may play a role in altering cell proliferation[16].

It is difficult to diagnose Zika virus infection based on clinical signs and symptoms alone due to overlaps with other arboviruses that are endemic to similar areas[17] . In small case series,

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routine chemistry and complete blood counts have been normal in most patients. A few have mild leukopenia, thrombocytopenia, and elevated liver transaminases[18]. Zika virus can be identified by reverse transcriptase PCR (RT-PCR) in acutely ill patients (1-3 days from serum, 3-5 days from saliva or from urine after 14 days)[19]. More over specific IgM and IgG antibodies to Zika virus can be identified by serology within 3 days of the onset of illness[20].

The CDC recommends screening some pregnant women even if they do not have symptoms of infection. Pregnant women who have traveled to affected areas should be tested between two and twelve weeks after their return from travel and women who are living in affected areas, testing at the first prenatal visit with a doctor as well as in the mid-second trimester[21]. Women with positive test results for Zika virus infection should have their fetus monitored by ultrasound every three to four weeks to monitor fetal anatomy and growth. For infants with suspected congenital Zika virus disease, the CDC recommends testing with both serologic and molecular assays such as RT-PCR, IgM ELISA and plaque reduction neutralization test (PRNT). RT-PCR of the infants serum and urine should be performed in the first two days of life[22].

As an increased prevalence of microcephalic neonates in Brazil related to the outbreak of the Zika virus infection during the gestational period it also alarming in country as the mosquito and possibly virus both are available in this regions. So step should be taken to prevent virus spread by mosquitoes. The CDC recommends strategies for controlling mosquitoes such as eliminating standing water, repairing septic tanks and using screens on doors and windows[23]. Spraying insecticide is used to kill flying mosquitoes and larvicide can be used in water containers.The CDC also issued a travel alert to the pregnant women to consider postponing travel entirely to the countries and territories with ongoing local transmission of Zika virus if possible and, if travel is unavoidable, to protect themselves from mosquito bites[24]. Male partners of pregnant women and couples contemplating pregnancy who must travel to areas where Zika is active are advised to use condoms or abstain from sex[24]. The agency also suggested that women thinking about becoming pregnant should consult with their physicians before traveling[23,24].

In conclusions, careful and competence studies are required in endemic regions in order to inform local risk assessments, awareness build up in vulnerable host groups about Microcephaly and GBS and efforts towards a vaccine development as well as immunization and therapeutics need to be accelerated. Moreover, precautions need to avoid the pathogen entering in to the host.

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Original Article

A Study on Corneal Curvature of Eyebal in Emmetropic Eye in Bangladeshi Population.

Maskura Benzir[1], Rashed Mustafa[2], Afroj Zahan[3], Mst. Taslima Akter[4], Rawshon Ara Naznin[5], Most. Morsheda Khatun[6].

ABSTRACT

CONTEXT: *Corneal curvature is one of the most important determinant of refractive errors and many oculoplastic surgeries. This is very crucial in biometry for the measurement of the power of intraocular lens accurately in cataract surgery. Many studies were done in various populations to determine corneal curvature in emmetropic eye. However, in Bangladesh there is an only one study on this context.* ***OBJECTIVES:*** *This study was aimed to determine the corneal curvature in emmetropic eye in Bangladesh.* ***METHODS****: The descriptive cross sectional observational study was conducted in the Department of Ophthalmology, Rajshahi Medical College Hospital over a period of July 2017 to June 2018 and sample was collected from people who had 6/6 visual acuity.* ***RESULTS:*** *Of a total 200 participants mean ±SD age were 36.5(±14.5) years. The sex distribution was almost equal. The mean corneal curvature of right and left eye was 44.05±.096 D and 44.10±.094 D respectively.* ***CONCLUSION:*** *Kerratometry is a non-invasive diagnostic and assessment tool to measure corneal curvature in diopter in emmetroic eye,which might help in the actual measurement of intraocular lens implantation in cataract surgery and may also provide information to researcher domain.*

Key words: Corneal curvature, keratometry, emmetropic eye.

INTRODUCTION:

One of the important ocular structures is cornea which involved in the mediation of visual perception. This is the principal refractive surface of eye[1]. The state of refraction depends upon the balance of eyeball changes and refractive component the cornea and crystalline lens[2]. The normal visual acuity is 6/6 which is known as emmetropic eye. To achieve 6/6 visual acuity, corneal curvature should be such that the light rays are accurately focused on retina and refract through lens[3]. Emmetropia refers to an eye that absence of refractive error. The measurement of corneal curvature is important in diagnosis and management of ocular diseases such as keratoconus and glaucoma. Measurement of this variable is one of the main components for calculating the accuracy of intraocular lens power. Changes of corneal curvature are an

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important biometric factors affecting refractive status. Only one study was done in Bangladesh about this topic. Other studies in different countries, it was observed that measurements vary in different population. This study may help in pathological diagnosis, and surgical managements of cataract surgery and manufacturing of spectacles. As there was limited study on this context in our population, further study in larger population in Bangladesh need to be survey on corneal curvature in emmetropic eye.

MATERIALS AND METHODS:

The descriptive cross sectional observational study was carried out to evaluate 200 subjects who were emmetropic eye and attend with the patient, in department of Ophthalmology in Rajshahi Medical college between from July 2017 to June 2018.All subjects under went through face to face interview, checking visual activity by Snellen chart and corneal curvature of eyeball by the Autokerratometer. To enhance the effectiveness of the findings 200(400eyes) sample were taken. Sample population was selected by purposive random sampling. Ethical permission was taken from the Institutional Review Committee of Rajshahi Medical College, Rajshahi.

RESULTS

A total 200 healthy adult people were included in the study. The variables were measured by Autokerratometer. The findings obtained from the study were presented below:

Table I shows age distribution of the study participants (n = 200) that the highest number of participants was in 21 to 30 years and lowest were in 40 to 60 years.

Table I: Age distribution of the study participants (n=200)

Age distribution	Frequency	Percent
21 -30	117	58.5
31-40	75	37.5
41-50	7	3.5
51 -60	1	.5
Total	200	100.0

Table II represents frequency of right corneal curvature in emmetropic eyes carries highest number of sample population.

Table II: Frequency distribution of right corneal curveture (n=200)

Right corneal curvature in diopter	Frequency	Percent
40-41	3	1.5
41.01-42	10	5.0
42.01-43	34	17.0
43.01-44	54	27.0
44.01-45	58	29.0
45.01-46	20	10.0
46.01-47	17	8.5
47.01-48	4	2.0
Total	200	100.0

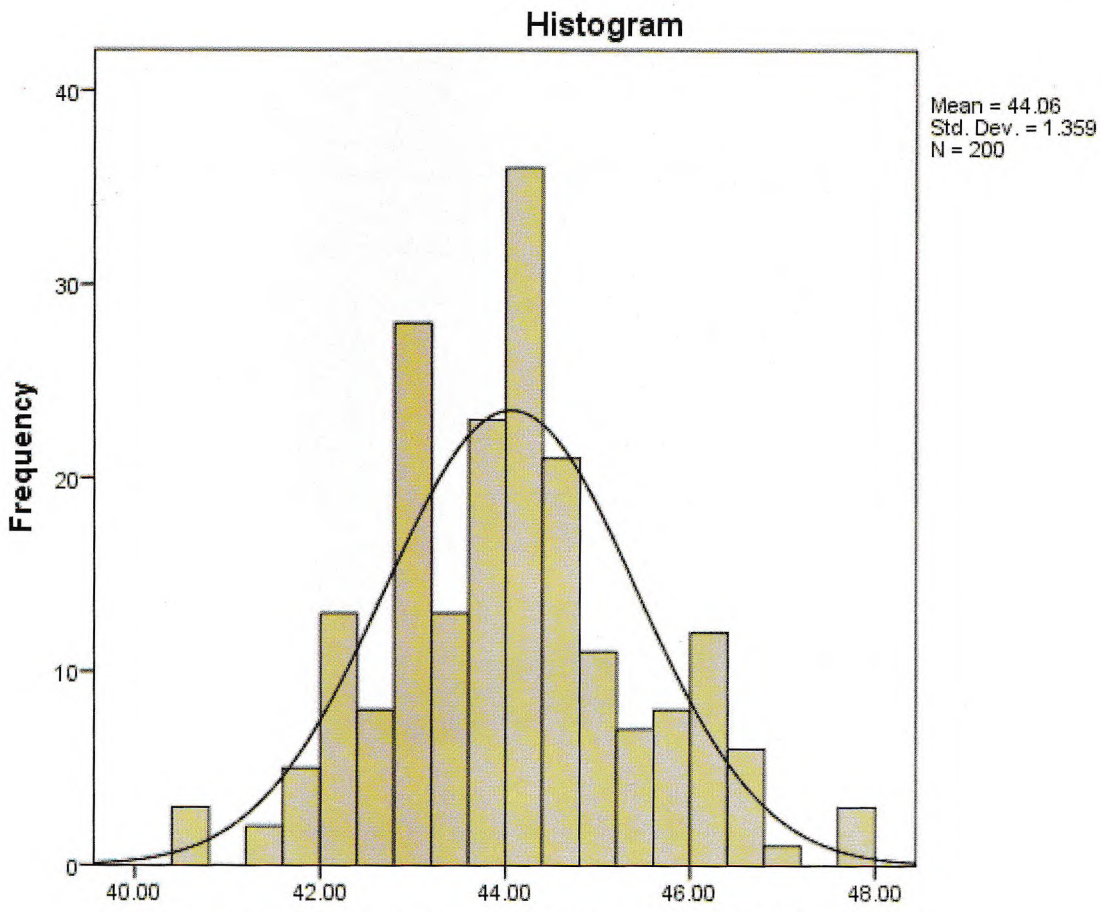


Figure 1: Histogram showing the normal distribution of right corneal curvature.

Table III represents the descriptive study of the distribution of corneal curvature, in which standard error, standard deviation and variance was 0.096, 1.35, and 1.84 respectively.

Table III: Right corneal curveture with SD, SE and Variance

Right corneal curvature in diopter	n	Minimum	Maximum	Mean±SD	Std.Error	Variance
	200	40.62	47.75	44.0555±.1.35851	.09606	1.846

Table IV represents frequency of left corneal curvature in which frequency 43-45 carries most of the population.

Table IV: Frequency distribution of left corneal curveture (n=200)

Left corneal curvature in diopter	Frequency	Percent
40-41	3	1.5
41.01-42	7	3.5
42.01-43	30	15.0
43.01-44	58	29.0
44.01-45	61	30.5
45.01-46	22	11.0
46.01-47	16	8.0
47.01-48	3	1.5
Total	200	100.0

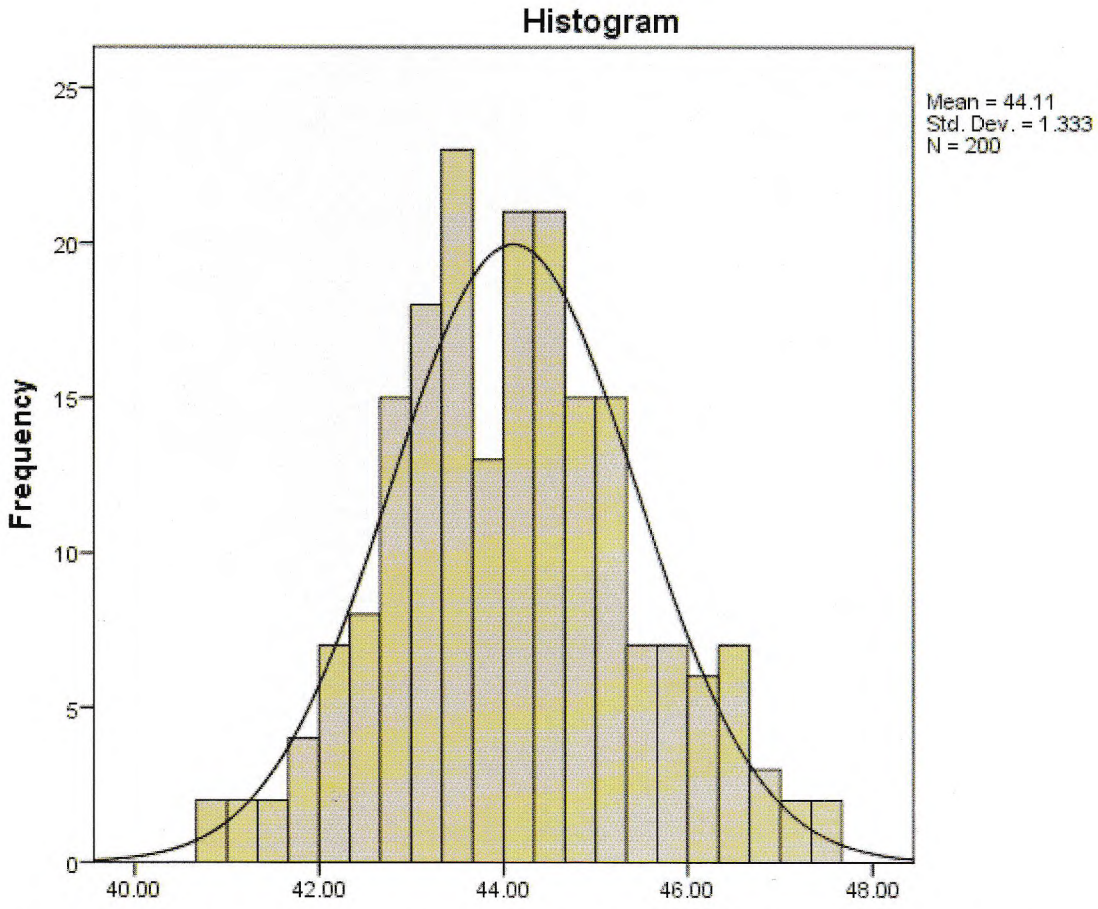


Figure 2: Histogram showing the normal distribution of left corneal curvature.

Table V shows the distribution of left corneal curvature represents the descriptive studies of left corneal curvature. In which standard error, standard deviation and variance are 0.094, 1.33 and 1.77 respectively.

Table V: Left corneal curveture with SD, SE and Variance

Left corneal curvature in Diopter	n	Minimum	Maximum	Mean±SD	Std.Error	Variance
	200	40.75	47.62	44.1078±1.33327	.09428	1.778

DISCUSSION

Among the 200 subjects, total 400 of emmetropic eyes under study the mean age was 36.5-years and their age range was 21 to 52 years. To avoid the chance of primary refractive error the sample population was selected above 18 years. Majority of the participant's (58.5%) age range was 21 to 30 years (table 1) as secondary refractive error usually absent in this age group. The lowest age group was in 4th and 5th decade, which was only 4% (table 1) because after that age incidence of secondary refractive error and various systemic diseases became more. So frequency of participants was decline in that age group. The age range of the participants were well correlate with Hoque E (2010)[3] and Solu et al[4]. (2016). In the present study, the average keratometry of right eye was 44.05±1.35 diopter and in left eye was 44.01±1.33 diopter which was well correlated with Hoque E (2010)[3], where the average corneal curvature was 43.73±1.59 diopter in Bangladesh and similar with this study. Another study done by Solu et al. (2016)[4], found that the average corneal curvature was 44.21±1.59 diopter in India and this study also similar with present study. A study also concern about this variable done by A.K.C. Lam and W.A Douthwaite in China their age group was between 19 to 25 years and they took 24 subjects and the measurement in both eye was 43.5±1.25 D which was similar with this study[5]. A findings is well congruent with this findings which was carried out by Tasneem et al. (2015)[6] in India, they took 102 individuals. Their age group and result was similar .The measurement was 43.5±0.67D in both eye. In UK a study done by Neville A McBiren and Michel Milodot they worked on 30 subjects in 1987 and their finding was 42.72±1.23D which was almost match with the study[7]. Cheung et al. (2020)[8] in china also did a study on this same variable measurement, their age group was 18-37 year and findings was 43.66±1.2D which was correlate with this study. There were various studies concerning about this variable (KP Mashige) 1 and their findings also well congruent with this study. In Nigeria, a study also carried out by Lyamu et al. (2015)[9] in which the measurement of this variable is little deviated from this result may be due to they took only 11 subjects.

CONCLUSION

The corneal curvature provides many information about healthy cornea and possible changes associated with different ocular diseases, aging process, ethnicity and gender. This is a useful method in studying in different ophthalmic measurement. Corneal curvature is an important factor to maintain emmetropia. The average keratometry of right eye was 44.05±1.35 diopter and in left eye was 44.01±1.33 diopters which might be utilized in various applications in medical science not only in ophthalmology but also in measuring the power of intraocular lens accurately in cataract surgery, age, gender, ethnicity, stature and anthropometric factor. The findings of the study might provide supplementary information to other researcher in this domain

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Original Article

The Study of Cardiac Autonomic Activity to Resting Heart Rate and Blood Pressure in Overweight Individuals

Suraiya Pervin[1], Chandra Rani Sarkar[2], A.T.M Zoadur Rahim Zahid[3] and Haripada Sarkar[4]

ABSTRACT

BACKGROUND: *Overweight has become a major public health concern in the modern day society, associated with impairment of autonomic control of heart rate and blood pressure during resting condition.* ***OBJECTIVES:*** *To evaluate the autonomic control of heart rate and blood pressure during resting condition in overweight individuals.* ***METHODS:*** *This cross-sectional analytical study was conducted in the Department of Physiology, Rangpur Medical College, Rangpur. After obtaining permission the subjects who would meet the inclusions and exclusions criteria were enrolled in the study after briefing them about objectives. The study included 80 subjects, divided in two groups (Group A- normal weight and Group B- overweight). Then resting heart rate and blood pressure were assessed by using ECG machine and sphygmomanometer. The subjects were selected from different areas of Rangpur division. Data were analyzed by unpaired* t *test, where* $p \leq 0.05$ *was accepted as significant.* ***RESULTS:*** *Results showed that in resting condition the mean resting heart rate was non significantly higher in overweight* ($p > 0.05$)*. Again, mean resting systolic blood pressure was significantly* ($p < 0.05$) *higher but mean diastolic blood pressure was higher but non-significant* ($p > 0.05$) *in overweight individuals than normal weight individuals.* ***CONCLUSION:*** *Autonomic dysfunction in overweight individuals associated with increased both resting heart rate and blood pressure, which has been linked with adverse cardiovascular outcomes.*

Key words: Overweight, Autonomic functions, Resting heart rate, Resting blood pressure.

INTRODUCTION

Overweight is a nutritional health problem which is gradually increasing and affecting all ages of population. Epidemiological data shows that prevalence rates are increasing not only in industrialized countries but also in developing countries[1]. In Bangladesh, 7% adults were overweight or obese in 1980 but those rates had claimed to 17% in 20132. Overweight is on rise in our society due to socioeconomic developments leading to change in lifestyle particularly dietary pattern[1].

Overweight and obesity are due to abnormal or excessive fat accumulation in body that may impair health and it is due to an imbalance between calories intake and expenditure[2]. Mortality rates increase with increasing degrees of overweight[3]. According to World health organi-

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zation (WHO) the most commonly used indicator of general adiposity is "Body mass index (BMI)" measured in kg/m^2. BMI of 20-25 kg/m^2 is considered as normal. If it is between 25-29.9 kg/m^2 is termed as overweight. If it is more than 30 kg/m2 then it is referred as obese[4]. The world health organization recommends the cut off values for the definitions of overweight and obesity should be lower for Asian populations as follows[5];

Normal weight: BMI 18.5 to 22.9 kg/m^2, WC: Male < 90 cm, Female < 80 cm Overweight: BMI 23 to 24.9 kg/m^2, WC: Male ≥ 90 cm, Female ≥ 80 cm Obese: BMI ≥ 25 kg/m^2, WC: Male ≥ 94 cm, Female ≥ 88 cm

The autonomic nervous system (ANS) is responsible for regulation heart rate and blood pressure through its two branches: the sympathetic and parasympathetic nervous system[6]. As energy metabolism as well as regulation of cardiovascular system is influenced by ANS, so overweight individuals can be considered to suffer an alteration in their autonomic nervous system. The assessment of ANS requires recording the response of an end organ to physiological maneuvers. Changes in blood pressure and heart rate by a stimulus which reflects sympathetic and parasympathetic modulation and activity of heart respectively. Together they determine autonomic activity[7].

Normally heart rate varies continually but this depends on an intact parasympathetic nerve supply. An elevated heart rate is a warning about an increased risk of cardiovascular dysfunction. A 10% increase in body weight is associated with a decline in parasympathetic tone, accompanied by a rise in mean heart rate and conversely, heart rate declines during weight reduction[8].

In overweight individuals initially sympathetic stimulation occurs. That causes an increase in vasomotor tone and cardiac output. So the final result is increase in basal systolic and diastolic blood pressure in overweight adults. This finding strongly indicates that overweight individuals as an at-risk population[9].

Autonomic imbalance with increased sympathetic activity and vagal tone has been strongly implicated in the pathophysiology of development of arrhythmias and sudden cardiac deaths[10]. This alteration, together with other systemic effects of obesity, can promote early damage to the integrity of the body. Therefore, the autonomic dysfunction present in overweight individuals is of fundamental clinical importance both from a preventive therapeutic point of view[11].

MATERIALS AND METHODS:

This cross-sectional analytical study was conducted in the Department of Physiology, Rangpur Medical College, Rangpur, Bangladesh from July 2017 to June 2018. A total number of 80 apparently healthy subjects, aged 20-40 years were included in this study from different community of Rangpur division. Before perform the tests and collection of sample all the subjects were briefed about the objectives of the study. Informed written consent of the study subjects were taken in easily understandable Bengali phrases. A standard questionnaire was filled up after taking history and thorough clinical examinations.

All the study subjects were divided into two groups on the basis of their body mass index, among them 40 normal weight individuals was denoted as group A and 40 overweight individuals was denoted as group B. They were matched with age, sex and socioeconomic condition. Study was carried out with prior protocol approved by the thesis protocol review commit-

tee and ethical committee of Rangpur Medical College. Obese and history of Diabetes mellitus, Chronic renal failure, Hypertension, Cardiac complication, Chronic obstructive lung diseases, Smoking and alcohol abuse, Any Neurological disorder, Psychiatric disorders (Depression) taking any neurotoxic drug, Endocrine disorders (thyroid, adrenal etc.) and Previous history of head injury were taken as exclusion criteria.

For calculation of BMI weight in Kg and height in m^2 of each subject was taken by medical weighing machine and measuring tape respectively for measuring waist circumference (WC). From the previous night up to the examination, they should not undergo any physical or mental stress and not to take any sedatives or any drugs affecting central nervous system. Then resting heart rate and blood pressure were assessed by using ECG machine and sphygmomanometer. These tests were conducted in a comfortable environment in the department of physiology laboratory from 9.00am - 2.30pm.

Resting heart rate[12]:
The subjects were asked to take rest for 10 minutes in supine position and radial pulse rate was recorded in supine position and expressed as beats/min. Three reading were taken and the average of the three was taken as the resting pulse rate.

Resting blood pressure[13]:
The subjects were asked to take rest for 10 minutes in supine position. The resting blood pressure (BP) was recorded in supine position using mercury sphygmomanometer and expressed in mmHg. Three readings were taken and the average of the three was taken as the resting blood pressure.

All data were recorded systematically in a preformed history sheet and all statistical analysis was done by computer using the software SPSS 23.0 version for windows. Comparison between study groups (overweight) with control group (normal weight) was done by unpaired ☒t☒ test. In the interpretation of results, < 0.05 level of probability (p) was accepted as significance.

RESULTS:

The mean ± SD of age were 29.1500 ± 6.33489 years in group A and 30.7 ± 7.63 years in group B. The mean ± SD of height was 1.62± 0.12 m in group A & 1.65 ± 0.09 m in group B and the mean ± SD of weight was 56.15 ± 8.53 kg in group A, 63.07 ± 8.08 kg in group B. The mean ± SD of BMI were 21.39 ± 0.95 kg/m^2 in group A, 23.63 ± 0.54 kg/m^2 in group B. The mean ± SD of WC were 71.82 ± 6.55 cm in group A, 86.7 ± 5.22 cm in group B. The age and height were statistically non-significant between the groups but weight, BMI and WC were very highly significant in group B than group A (Table – I).

The mean ± SD of resting heart rate were 68.6± 3.3 beats/min in group A and 70.8 ± 4.89 beats/min in group B. The mean resting heart rate were non-significantly ($p > 0.05$) higher in group B than group A (Table –II).

The mean ± SD of resting systolic blood pressure were 114.75 ± 10.19 mm of Hg in group A and 120.5 ± 9.32 mm of Hg in group B. The mean systolic blood pressures were significantly ($p < 0.05$) higher in group B than group A (Table – III).

The mean ± SD of resting diastolic blood pressure were 72.5 ± 7.84 mm of Hg in group A and 74.38 ± 8.41 mm of Hg in group B. The mean diastolic blood pressures were nonsignificantly ($p < 0.05$) higher in group B than group A (Table – III).

Table - I: Mean ± SD of age, height, weight, WC and BMI of the study subjects in group A and group B.

Parameters	Mean ± SD		P value
	Group A (n=40)	Group B (n=40)	
Age-years	29.15±6.33	30.7±7.63	.586^{NS}
Height-m^2	1.61±0.12	1.65±0.09	.321^{NS}
Weight- kg	56.15±8.53	63.06±8.08	.001**
BMI-kg/m^2	21.39±0.95	23.63±0.54	.000***
WC-cm	71.82±6.55	86.7± 5.22	.000***

Data were expressed as mean ± SD. Unpaired ☒t☒ test were done.
Group A: Apparently healthy subjects of normal weight with BMI 18.5- 22.9 kg/m^2.
Group B: Apparently healthy subjects of overweight with BMI 23- 24.9 kg/m^2.
n = Number of subjects.
P value <0.05 was taken as level of significance.
SD = Standard deviation.
NS = p > 0.05
***= p <0.001
**= p <0.01

Table -II: Showing mean ± SD of resting heart rate of the study subjects in group A and group B.

Variables	Mean ± SD		P value
	Group A (n=40)	Group B (n=40)	
Resting heart rate (beats/min)	68.6±3.3	70.8±4.89	.055^{NS}

Data were expressed as mean ± SD. Unpaired t test were done.
Group A: Apparently healthy subjects of normal weight with BMI 18.5- 22.9 kg/m^2.
Group B: Apparently healthy subjects of overweight with BMI 23- 24.9 kg/m^2.
n = Number of subject
SD = Standard deviation.
NS = p > 0.05
Normal Heart rate = 60 – 90 beats / min.

Table –III: Mean ± SD of resting systolic and diastolic blood pressure of the study Subjects in group A and group B.

Variables	Mean ± SD		P value
	Group A (n=40)	Group B (n=40)	
Resting systolic blood pressure (mm of Hg)	114.75± 10.19	120.5 ± 9.32	.027*
Resting diastolic blood pressure (mm of Hg)	72.5 ±7.84	74.38 ± 8.41	.560^{NS}

Data were expressed as mean ± SD. Unpaired ☒t☒ test were done
n = Number of subjects
Group A: Apparently healthy subjects of normal weight with BMI 18.5- 22.9 kg/m^2.
Group B: Apparently healthy subjects of overweight with BMI 23- 24.9 kg/m^2.
Normal systolic blood pressure = 120 mm of Hg.
Normal diastolic blood pressure = 80 mm of Hg.
*= $p < 0.05$
NS = $p > 0.05$

DISCUSSION:

In the present study cardiac autonomic modulation in overweight and normal weight individuals were examined. The resting mean heart rate was nonsignificantly more in overweight in comparison to normal weight group. Similar studies support the findings of tachycardia overweight and the reason probably being altered autonomic modulation in intrinsic heart rate. Increased heart rate is also imputed to relatively suppressed vagal tone[14,15].

This study also shows that systolic blood pressure was significantly higher but diastolic blood pressure was non significantly higher in overweight which are supported by some studies[16,17].

The heart rate is an integrated index of autonomic cardiovascular function[8]. During normal sinus rhythm, the heart rate varies from beat to beat. Changes in heart rate results from the interplay between the various physiological

mechanisms that regulate heart rate. Since short term regulations are predominantly governed by parasympathetic neural activity, by examination of heart rate fluctuations, normal functioning of autonomic nervous system can be tested1. A high resting heart rate is more frequently seen in overweight individuals and related to the development of various cardiovascular complications. Tachycardia is an independent risk factor because it increases in arterial wall stress and ventricular vulnerability. Several studies of overweight populations have shown that tachycardia also associated with many other risk factors for atherosclerosis, including high blood pressure, increased blood glucose, lipid abnormalities and hyperinsulinemia[17].

Sympathetic activation contributes to higher blood pressure level in overweight individuals. Higher baseline systolic and diastolic blood pressure in overweight could be due to higher vasoconstrictor tone and increased in cardiac output due to increased load on heart, as a consequence of increased body mass index. Part of increased cardiac output observed with weight gain due to additional blood flow required for the extra adipose tissue[18]. Some studies have suggested that overeating and subsequent weight gain is responsible for sympathetic over activity, whereas other have demonstrated that a primary sympathetic over activity might lead to excess weight[17].

Overweight is associated with both sympathetic and parasympathetic nervous system dysfunction which may result in various cardiovascular complications[19]. Altered autonomic activity could be the reason for increased mean heart rate and blood pressure in overweight individuals and may be at a high risk of subsequent atherosclerotic diseases early in adult life. Therefore, the prevention and reduction of these risk factors by changing lifestyle, especially by promoting exercise and favorable eating behaviors, is fundamental to the prevention of cardiac diseases later in life.

CONCLUSION:

This may be concluded that autonomic dysfunction in overweight individuals associated with increased both resting heart rate and blood pressure, which has been linked with adverse cardiovascular outcomes.

LIMITATIONS:

- The study has moderate sample size taken from one region.
- As the study has few female subjects effects of gender on autonomic function test is not studied.

RECOMMENDATION:

Future studies are recommended with larger sample to extrapolate the results of cardiac autonomic responses in prehypertensives.

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Original article

Evaluation of Cardiovascular Sympathetic Nerve Functions by Sustained Handgrip Test in Healthy Adult Male Sedentary Workers

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ABSTRACT

BACKGROUND: *Sedentary lifestyle is public health concern that threatening human health. It is an independent predictor of cardiovascular disease (CVD) morbidity and mortality, yet little is known about the effect of sedentary behavior on markers of cardiovascular health in active adults.* ***OBJECTIVES:*** *To assess the cardiovascular Sympathetic nerve functions by the sustained handgrip test in healthy adult male sedentary workers.* ***METHODS:*** *This cross-sectional analytical study was conducted from January 2019 to December 2019 in the Department of Physiology, Rangpur Medical College, Rangpur. After obtaining permission, a total 60 subjects who would meet the inclusion criteria were enrolled in the study after briefing them objectives of the study. Among them 30 were healthy adult male heavy workers (Group-A) and 30 were healthy adult male sedentary workers (Group-B). The evaluation of cardiovascular sympathetic nerve functions in selected individuals was done by sustained handgrip test. For statistical analysis unpaired t-test was performed by computer-based software SPSS-23.0 version for windows.* ***RESULTS:*** *The resting systolic and diastolic blood pressure are non-significant in selected individuals. Diastolic blood pressure response by sustained handgrip test was significantly lower in sedentary workers. ($p< 0.05$).* ***CONCLUSION:*** *The study thus concluded that decreased diastolic blood pressure response by sustained handgrip test in sedentary individuals indicate impairment of the sympathetic nerve function.*

Key words: Sedentary workers, heavy workers, handgrip test, sympathetic nerve functions.

INTRODUCTION

Sedentary behavior is currently a global lifestyle phenomenon that has associated with reduction in energy expenditure independent of moderate to vigorous physical activity[1]. According to World health organization (WHO) about 60% to 85% of people in the world from both developed and developing countries lead sedentary life style, making it one of the more serious yet insufficiently addressed public health problem of our time[2,3]. Bangladesh is one of the developing countries where nationally representative and internationally comparatively data on physical activity (PA) level are still inadequate[4,5].

Physical activity can be measured in metabolic equivalents or METS. One Mets is the energy expanded while sitting at rest. An activity with a METs value of 5 means expanding five times the energy and calories than we would at rest.

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The individuals spend in various behaviors that require low energy expenditure such as sitting or standing, studying, talking are sedentary worker. METs value of these workers are1.5-2.5. The person who work like this –Manual labor or in forestry work, climbing, basketball, football, swimming, running is strenuous or heavy workers. METs value of these workers are 7.5-12[6,7].

Physical inactivity leads to a number of health complication and various media campaigns are designed to encourage increase in physical activity level and promote healthy lifestyle. In developed economies, knowledge workers typically have a work style that requires sitting for prolonged periods of time. As a number of studied have shown; sedentary work style leads to an array of health complications, including type-2 diabetes mellitus, high blood pressure and obesity[8,9].

Physical inactivity may increase risk of cardiovascular disease due to changes in central pathways involved in autonomic nervous system regulation. Whilst research linking physical activity (PA), sedentary behaviors and autonomic function is limited, available evidence suggests that some relationship exist[10,11]. The autonomic nervous system is responsible for regulation and integration of internal organ functions[12]. The autonomic nervous system (ANS) comprises of sympathetic and parasympathetic components responsible for stimulation or energy release and recovery respectively. Altered autonomic function, for example, enhanced sympathetic and reduced parasympathetic tones, may predispose individuals to poor cardiovascular health due to reduced baroreflex sensitivity, reduced endothelial function and hypertension[13].The sympathetic nervous system is closely linked with cardiovascular system, of which over activity can lead to detrimental structural and functional change to the vasculature, and arterial stiffness[14]. Chronic physical inactivity affects the excitability of rostral ventrolateral medulla (RVLM) neurons directly and contributes to sympathetic overactivity[15,16]. Sympathetic over activity caused an increase in BP, which in turn could influence vascular structure and tone, via stiffening of carotid artery, aorta resulting in reduced baroreceptor responsiveness (or baroreceptor sensitivity; BRS) to change in BP[14]. A reduction in BRS is associated with regulation of BP, electrical instability of the heart and therefore increased risk of CVD morbidity and mortality[17]. The integrity of the autonomic nervous system (ANS) may be assessed with a simple, reliable and non-invasive by handgrip tests based on cardiovascular reflexes is useful tool for evaluation of sympathetic modulation of the heart[18].

Cardio metabolic changes resulting from a sedentary lifestyle may take many years to be clinically detectable. The present study would be done to clarify the cardiac sympathetic nerve functions changes among sedentary workers. Therefore, emphasis should be laid on early detection of the autonomic dysfunction in sedentary population.

MATERIAL AND METHODS:

This is cross sectional analytic study was conducted in department of physiology, Rangpur Medical college, Rangpur from January 2019 to December 2019. A total number of 60 individuals, which are apparently healthy adult male and their age ranged from 25-45 years were included in this study. Samples of heavy workers are collected from day labor who works in constructing building,

sedentary workers are collected from bank workers in Rangpur district.

Before perform the sympathetic nerve function test and collection of samples all the subjects were briefed about the objective of study. Informed written consent of the study subjects was taken in easy understandable Bengali phase All information was recorded in a preformed questionnaire after taking history and through clinical examination.

All the subjects were divided into two groups on the basis of their working style. Among them 30 were heavy workers denoted as group A and 30 are sedentary workers as group B. They were matched with age. Study was carried out with prior protocol approved by thesis protocol review committee and ethical committee of Rangpur Medical College. Obese, overweight, history of diabetes mellitus, chronic obstructive lung diseases, smoking and alcohol abuse, any neurological disorder, psychiatric disorder(depression) taking any neurotoxic drugs, endocrine disorder (thyroid, adrenal etc.) and previous history of head injury were taken as exclusion criteria.

From the previous night up to the examination, they were not undergoing any physical or mental stress and not to take any sedatives or any drugs affecting central nervous system. Blood pressure response to sustained handgrip test were conducted in a comfortable environment in the department of physiology laboratory from 9.00am - 2.30pm.

Blood glucose, serum creatinine level and serum alanine amino transferase were measured to exclude diabetes mellitus, chronic renal failure and liver diseases respectively Resting blood Pressure: The subjects were asked to take rest for 10 minutes in supine position and blood pressure were recorded in supine position and expressed as mmHg. Three reading were taken and the average of three was taken as the resting blood pressure Blood pressure response to sustained handgrip:

The subject's resting blood pressure were recorded. Then they were asked to grip the inflated cuff of a sphygmomanometer. The handgrip then maintained at 30% maximum voluntary contraction for maximum 5 minute and then again blood pressure was measured. Difference in the diastolic blood pressure before and after sustained handgrip was calculated.

Normal: ≥16 mmHg, Borderline: 11-15 mmHg, Abnormal: ≤10 mmHg10 .
All data were recorded systematically in a preformed history sheet and all statistical analysis was done by computer using the software SPSS 23.0 version for windows. Comparison between the experimental group with control group was done by unpaired t test. In the interpretation of result, <0.05 level of probability was accepted as significance.

RESULTS:

The mean ± SD of age were 29.76 ± 4.85 years in group A and 33.96 ± 6.46 years in group B. The mean ± SD of height were 1.61± 0.05 m group A and 1.62 ± 072m in group B. The mean V SD of weight were 58.73 ± 0.86 kg in group A and 68.56 ± 6.18 kg in group B. The mean ± SD of BMI were 20.68 ± 1.12 kg/m^2 in group A and 21.97 ± 1.10 kg/m^2

Table- I: Showing mean ± SD of age, height, weight and body mass index of the study subjects of in group A and group B:

Group	Age- Year	Height-m	Weight-kg	BMI –kg/m2
A(n=30)	29.76 ± 4.85	1.61± 0.05	58.73 ± 0.86	20.68 ± 1.12
B(n=30)	33.96±6.46^{NS}	1.629± 07^{NS}	68.56± 6.18^{NS}	21.97 ± 1.10^{NS}

Data were expressed as mean ± SD. Unpaired t- test were done.
Group A: Apparently healthy adult male heavy workers.
Group B: Apparently adult male sedentary workers.
n= number of subjects
SD=Standard deviation
NS = P > 0.05.

The mean ±SD of resting systolic and diastolic blood pressure were 121.50± 8.82 mmHg and 78.50±5.43 mmHg in group A and resting systolic and diastolic blood pressure were 131.00 ± 9.13 mmHg and 83.66 ± 6.00 mmHg in group B. The mean resting systolic and diastolic blood pressure were non-significant (p>0.05) in group B then group A.

Table II: Showing mean ±SD of resting blood pressure in Group A and Group B

Variable	Group A	Group B
Resting systolic blood pressure	121.50± 8.82	131.00 ± 9.13^{NS}
Resting diastolic blood pressure	78.50 ±5.43	83.66 ± 6.00^{NS}

Data were expressed as mean ± SD. Unpaired t test were done.
Group A Apparently healthy male heavy workers.
Group B Apparently healthy male sedentary workers.
n= number of subjects
SD= Standard deviation
NS = P > 0.05

The mean± SD diastolic pressure in response to sustained handgrip test were 8.1667 ± 2.45 in group A and 12.166±5.363 in group B. The mean values were significant ($p<0.01$) lower in group B than group A.

Table III- showing mean ± SD of diastolic blood pressure response to sustained handgrip test of the subjects in group A and group B.

Variables	Group A	Group B
Diastolic blood pressure	8.16 ± 2.45	12.166 ±5.36

Data were expressed as mean ± SD. Unpaired t test were done.
Group A Apparently healthy male heavy workers.
Group B Apparently healthy male sedentary workers.
n= number of subjects
SD =Standard deviation
*=p< 0.05.
Normal: ≥16 mmHg, Borderline: 11-15 mmHg, Abnormal: ≤10 mmHg11

DISCUSSION:

The present study was carried out to observe the changes in blood pressure response to sustained handgrip test between apparently healthy adult male heavy and sedentary workers. In sedentary worker's diastolic blood pressure response sustained handgrip test was significantly lower than heavy workers. This finding is consistent with that of some other investigators[19,20,21]. In contrast some other researchers did not find any significant difference in blood pressure response to sustained handgrip test in sedentary and heavy workers.

The precise mechanism that leads to detrition of cardio vagal function was not established clearly. Reduced diastolic pressure response to sustained hand grip in sedentary workers due to increase peripheral response to maneuver activating sympathetic system. This decreased sympathetic activity might be due to defect in sympathetic nerve activation or alternatively in peripheral adrenoreceptor behavior[19].

In heavy workers have increase in blood pressure is due to increased sympathetic activity mediated by the alpha adrenergic receptors of the autonomic nervous system. An increase in sympathetic activities due to impulses from the limbic cortex, motor cortex and the proprioceptors within small hand joints acting as afferent inputs into the medullary cardiac centers causing increase in blood pressure, both systolic and diastolic[20,21].

From this above discussion it may be concluded that significantly lower values of diastolic blood pressure in response to sustained hand grip test in sedentary workers, indicate decreased sympathetic activity may be due to defect in sympathetic nerve activation or in peripheral adreno- receptors.

However, the exact mechanisms involved for the impairment of sympathetic nerve function in sedentary workers of the present studies cannot be elucidated. In addition, the present study also shows that higher the spending time in sedentary works, the more number of subjects are involved with autonomic impairment. These has been associated with the cardiac autonomic activity and potential risk factor for cardiovascular morbidity and mortality.

CONCLUSION:

The result of the study suggested that with the help of simple, noninvasive handgrip test ,it has been shown that cardiovascular sympathetic nerve function activity were decreased in sedentary individuals .This might provide diagnostic information about early subclinical sympathetic dysfunction and is a useful tool to monitor the efficacy of therapeutic and lifestyle modification. As our study was cross sectional and limited in sample size . We recommend studding this test in a larger population in different age and workers groups for more asses the sedentary individuals to decreased non communicable disease burden in Bangladesh.

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Original article

Study of Peak Expiratory Flow Rate in Healthy School Going Children and its Relation with Sex and Height.

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ABSTRACT

BACKGROUND: *Peak expiratory flow rate (PEFR) is considered to be a simple and reliable index of pulmonary function test in the management and evaluation of asthmatic children. It is a simple and reliable method of assessing the disease progress and response to treatment.* ***AIMS AND OBJECTIVES:*** *Measurement of peak expiratory flow rate in a selected group of subjects and to find out the relation of sex and height with peak expiratory flow rate.* ***MATERIAL AND METHODS:*** *This study was conducted on 431 apparently healthy secondary school children (185 boys, 246 girls of class nine) of seven different schools in Rangpur city. A mini-Wright peak flow meter was used to measure peak expiratory flow rates. The highest of the three readings was taken as the correct value. The study was descriptive observational and cross sectional in nature with some analytical components. The relation of PEFR with sex and height in sitting posture of children were determined by using Correlation test, Unpaired t- test and paired t-test.* ***RESULT:*** *The mean PEFR in boys were 501.67 ± 81.49 and in girls were 354.22 ± 44.52 in sitting position. The amount of PEFR was increased regarding sex and height. There was a positive correlation of PEFR values with height of children (n=431). The results showed that there was a very highly significant difference of PEFR values between boys and girls ($p < 0.001$) and also a very highly significant positive correlation of PEFR values with height for boys and girls ($p<0.001$).* ***CONCLUSION:*** *PEFR measurements could be useful for evaluation the functional status of the respiratory system and monitoring of children with asthma.*

Keywords: PEFR, Wright's mini peak flow meter Height School going children.

INTRODUCTION

Respiratory diseases represent the most common cause of death in children worldwide[1]. Pulmonary Function Tests (PFTs) may act as significant aid in diagnosing and a valuable tool in monitoring patients suffering from respiratory diseases. The first and most common of the pulmonary function test is spirometry and complete spirometry may provide details of respiratory system state but the instrumentation for spirometry is expensive[2]. In contrast peak flow meter is an inexpensive device to measure peak expiratory flow rate and can help in assessing the degree of airflow limitation of individuals[3].

A peak flow diary can offer the clinician a

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longitudinal record by which can evaluate disease activity or therapeutic efficacy. A variation of greater than 20 percent of baseline may indicate increases reactivity[4]. Peak expiratory flow rate (PEFR) recording is an essential measure in the management and evaluation of asthmatic children[5]. The Peak Flow Meter is a useful instrument for monitoring PEFR in healthy children, asthmatic children, and adults[6]. Age, sex, weight, and height are the main factors that affect PEFR[7].

Described Peak Expiratory Flow Rate was described as measure of the lung function for the first time by Hadorn in 1942. In 1949 it was accepted as a spirometry parameter. European Respiratory Society states that PEFR is the maximal flow achieved during the phase of expiration, delivered with maximum force, which starts from the maximum lung inflation level. It occurs about 100 ms after a forced expiration start and peaks for 10 ms. It is applied to monitor the disease progress and the treatment outcome[8-10].

The peak expiratory flow rate (PEFR) varies with anthropometric, climatic, geographic and nutritional conditions[11-14].

Anthropometric measurements: Standing height is the best single predictor in childhood for PEFR[15].

Hence this study aims to construct a normal peak expiratory flow curve in both sexes in the age group of 14-16 years according to height from Rangpur district.

MATERIALS AND METHODS

Considering different socio-economic status, A total of 431 apparently healthy children with the age of 14 to 16 years (168-192 months) of both sexes (185 boys, 246 girls) were selected from class nine of seven different schools in Rangpur city. Permission was taken from Principals/Headmasters of the institute. From each school targeted samples were selected randomly in the class. For data collection a pre-designed proforma was used.

(Inclusion criteria)

1. Children of both sexes.
2. Apparently healthy secondary (Class nine) school going children of Rangpur city.

(Exclusion criteria)

1. Children who have been suffering from asthma or having past history of asthma or wheeze.
2. Child having the thoracic deformity or history of ARI within two weeks.
3. Child having history of atopic condition like eczema, hay fever or atopic rhinitis.
4. Children having any type of heart disease.
5. Children with major respiratory disease such as congenital anomalies or thoracic surgery.

The inclusion criteria for the study subjects were considered based on the information collected through an interview using a check list and also by direct physical observation as far as practicable. Students who fulfilled the inclusion criteria were separated, proper physical observation was conducted and questionnaire were appropriately filled up. Height was measured by measuring tape without shoes.

Air way condition was assessed with the help of well-functioning mini Wright Peak Flow Meter (mWPFM) and it was used to record PEFR (L/min).The PEFR were recorded three times for each sample in sitting position and the highest of three numbers was taken.

Data were collated and appropriate statistical analysis were done using computer based SPSS(Statistical Package for Social Sciences) in 16.0 version for window, level of significance was calculated at a confidence level of 95% ($p < 0.5$). The relation of PEFR with sex, height of different group children were determined by using Correlation test and Unpaired t- test, paired t-test, using age and height as the independent variables and PEFR as the dependent variable.

RESULT

The study population included 431 children from seven different high schools of Rangpur city, among which 185 and 246 were boys and girls respectively, male female ratio being 0.75:1 (girls relatively more than boys).

Table- I: Anthropometric measurements and PEFR (l/min) of study children (n=431)

Parameters	Sex & No. of samples(n)	Mean	Standard deviation
Age (month)	Boys (n=185)	173.58	6.00
	Girls (n=246)	171.81	11.64
Height (cm)	Boys (n=185)	166.10	7.17
	Girls (n=246)	154.99	5.49
PEFR (l/min) In sitting	Boys (n=185)	501.67	81.49
	Girls (n=246)	354.22	44.52

This table shows the anthropometric parameters and PEFR with its descriptive statistics of 431 normal students. The mean age for the boys was 173.58±6.00 and for the girls was 171.81±11.64 months. The mean height for the boys was 166.10±7.17and for the girls was 154.99±5.49 cm. The mean PEFR in the boys was 501.67±81.49 and the girls was 354.22 ±44.52 L/min in sitting position.

Table- II: Comparison of baseline characteristics and PEFR by sex

Parameters	Boys Mean± SD	Girls Mean± SD	P value
Age in month	173.58 ±6.00	171.81±11.64	> 0.05
Height in cm	166.10 ±7.17	154.99±5.49	< 0.001
PEFR in L/min sitting position	501.67±81.49	354.22±44.52	< 0.001

This table shows that there was no statistically significant difference of the mean age ($p > 0.05$) between boys and girls as all the samples were of same class (class nine). There were very highly statistically significant difference of the mean height ($p < 0.001$between boys and girls. There was also very highly statistically significant difference of the mean PEFR values ($p < 0.001$) between boys and girls in sitting position.

Table - III: PEFR (L/min) values for boys and girls by height range in sitting position

	Boys		Girls	
Height (cm)	**Number**	**PEFR in sitting Mean ± SD**	**Number**	**PEFR in sitting Mean ± SD**
<150	6	346.67±72.57	52	333.27 ± 47.06
150 - 155.99	6	418.33±63.06	82	353.90 ± 42.30
156 - 160.99	27	479.26±63.00	79	367.59 ± 37.53
161 - 165,99	45	495.11±84.09	26	345.77 ± 39.00
166 - 170.99	53	520.94±72.78	7	394.29 ± 70.44
171 - 175.99	30	526.00±69.31		
176 - 180.99	16	529.38±73.62		
>181	2	570.00±70.71		

This table shows PEFR values in relation to sex and height in sitting position . The PEFR values were elevated with increasing height. The rate of increase in boys was higher than girls. But in case of girls PEFR value in height range 156 -160.99cm was higher than that of 161-165.99 cm.

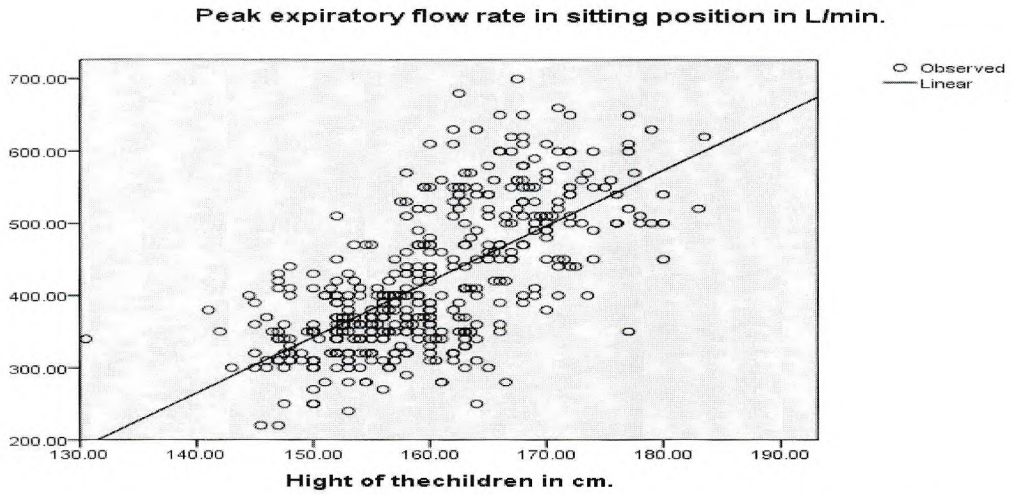


Fig. 1: Scatter diagrams depicts relationship of PEFR with height of children (n=431) in sitting position.

This Scatter diagrams depicts relationship of PEFR with height of children (n=431) in sitting position. There was a positive correlation considered PEFR as dependent and height as independent variable. The co efficient of correlation was very highly significant (r = 0.66 , p <0.001).

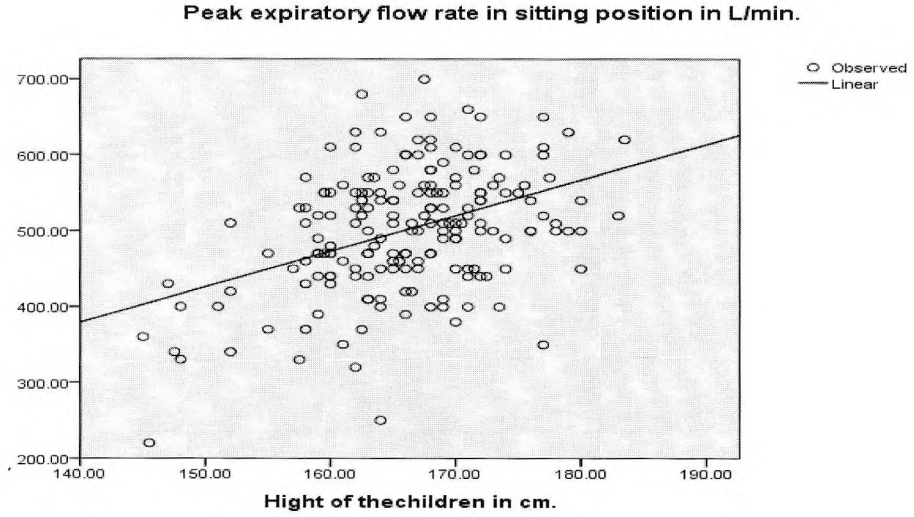


Fig. -2: Scatter diagrams depicts relationship of PEFR with height of boys(n=185) in sitting position.

This Scatter diagrams depicts relationship of PEFR with height of boys (n=185) in sitting position. There was a positive correlation considered PEFR as dependent and height as independent variable. The co efficient of correlation was very highly significant (r =0.412 , p <0.001).

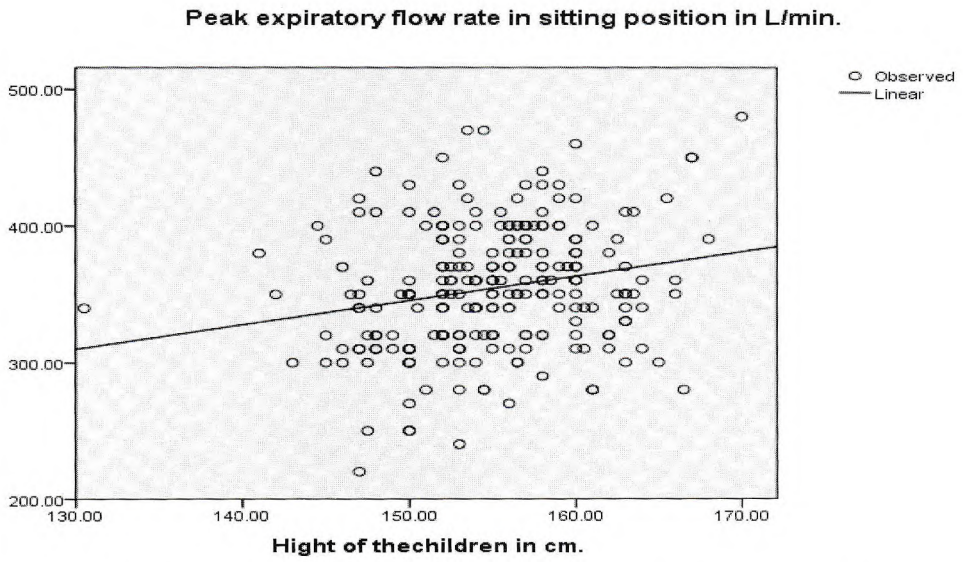


Fig. -3: Scatter diagrams depicts relationship of PEFR with height of girls (n=246) in sitting position.

This Scatter diagrams depicts relationship of PEFR with height of girls (n=246) in sitting position. There was a positive correlation considered PEFR as dependent and height as independent variable. The co efficient of correlation was highly significant in sitting position (r =0.218, p <0.01).

Table- IV: Correlation coefficient (r) and level of significance between and anthropometric parameters in sitting position (Total Sample).

Parameters	**Correlation with**	**Correlation Coefficient (r)**	***P* value**
Boys and girls(n=431) Height	PEFR	0.666	<0.001

This table Shows the summary of correlation coefficient (r value) and the level of significance of PEFR of children (n=431) with height in sitting position. Highly significant correlation was observed

Table-V: Correlation coefficient (r) and level of significance between PEFR (l/min) and anthropometric parameters, in sitting position (Boys and girls).

Parameters	Correlation with	Correlation Coefficient (r)	*P* value
Height Boys (n = 185) Girls (n = 246)	PEFR	r =0 .412 r =0 .218	<0.001 <0.01

This table Shows the summary of correlation coefficient (r value) and the level of significance between anthropometric parameter - height and PEFR in case of boys (n=185) and girls (n= 246) in sitting position. Highly significant correlation was observed.

DISCUSSION

This Cross-sectional analytical study was carried out with an aim to find out the relation of PEFR with sex, height and also to Measure the peak expiratory flow rate in selected group of healthy secondary school going children. This study showed that the mean PEFR (L/ min) value of boys (501.67±81.49) was higher than that of girls (354.22±44.52) in sitting position. . This study showed that PEFR values increased with height and were significantly higher in boys than girls.

A study of Peak Expiratory Flow (PEF) values was done in Turkish children between the ages 6 and 14 years old according to height, gender and age. The results showed that PEFR were significantly higher in boys than girls. There were no significant differences between mean height for boys and girls, but PEFR increased with age and height and were significantly higher in boys than girls. PEF values were also found to be highly correlated with the standing height in both girls and boys[16]. So, the finding of our study is almost similar to the result of this study.

In 1919 a study done in Kamataka, South India showing, PEFR values correlated best with height, there was no difference in sexes, religion and urban/rural children[17]. In most of the previous studies the emphasis was on finding the relationship of age, height and sex with PEFR and it was observed that these values increased with age and height up to a certain limit after which as the age advanced, the PEFR declined 18-22. In our study it was also observed that PEFR increased with height in both sexes in same age group of population.

The PEFR is an accepted index of pulmonary function and is widely used in respiratory medicine[23]. Serial PEFR monitoring is a convenient

method in investigation and diagnosis of occupational asthma[24] and often is used alone in the assessment of asthmatic patients[25-27].

Peak Expiratory Flow Rate (PEFR) is one of the useful and simple parameters for assessing the lung function status in general population and also for making a diagnosis and monitoring treatment of patients with bronchial asthma and chronic obstructive lung disease[28,29] .

PEFR is determined in large part by the lung volume, lung elastic recoil, and muscular effort[30]. Asthma is an important health problem in school-aged children and schools seemed to be an obvious site to find and work with children whose asthma was under-recognized and under-treated[31].

CONCLUSION

This study concluded that:

- There was a very highly significant difference of PEFR values between boys and girls ($p < 0.001$)
- There was a very highly significant positive correlation of PEFR values with height for both boys and girls.

RECOMENDATION:

PEFR is a reliable measurement, which can be used routinely and regularly in school going children for assessment of airway obstruction.

LIMITATION:

School going children of different age group(primary or secondary) with large sample would provided more informative information.

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Original Article

Irritable Bowel Syndrome in Pre and Postmenopausal Women in Northern Region of Bangladesh.

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ABSTRACT

BACKGROUND: *Irritable bowel syndrome (IBS) is a common health problem worldwide. Different symptoms of IBS are more common in pre-menopausal women than post-menopausal women.* ***OBJECTIVES:*** *To observe the symptoms of IBS in pre & postmanupausal women.* ***MATERIALS AND METHODS:*** *This cross-sectional study was conducted in the Department of Medicine, Prime Medical College & Hospital, Rangpur, Bangladesh. For this study, total number of 100 subjects was divided into two groups, pre-menopausal and post-menopausal women. The subjects were selected from different area of Rangpur division, Bangladesh.* ***RESULTS:*** *Different symptoms of IBS, among them Dyspepsia was observed 42(84%) in pre-menopausal and 12(24%) in post-menopausal women, bloating 39(78%) and 10(20%), Abdominal Pain 41(82%) and 9(18%), diarrhea 36(72%) and 10(20%), constipation 35(70%) and 15 (30%) in pre- and post-menopausal women respectively. Symptoms of IBS were more in pre-menopausal than postmenopausal women and it were statistically significant. Chi-Square test was used for statistical analysis and p value less than 0.05 was considered as significant.* ***CONCLUSION:*** *IBS is more common in pre-menopausal than post-menopausal women.*

Key word: Irritable Bowel Syndrome (IBS), pre and post-menopausal women.

INTRODUCTION:

IBS is a disorder in which abdominal pain or discomfort is a primary symptom. It is a change in bowel habit and abnormal stool frequency defined as >3 bowel movements per day [diarrhea] or <3 bowel movements per week [constipation][1]. IBS patients also commonly report hard or loose or watery stools, a feeling of incomplete evacuation after bowel movement, bloating and abdominal pain. IBS often coexists with other GI disorders, both functional (e.g., dyspepsia, chronic constipation) and organic (e.g., celiac disease, gastroesophageal reflux disease, inflammatory bowel disease (IBD)[2]. Furthermore, many patients with IBD are diagnosed initially with IBS[3]. Studies have shown that more than 40% to 57% of Crohn's disease patients and one third of ulcerative colitis patients who were in remission had comorbid IBS[4]. IBS is diagnosed on the basis of a characteristic cluster of symptoms—recurring bouts of

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abdominal discomfort or pain relieved by defecation and associated with a change in the frequency and/or consistency of stools—in the absence of structural or biochemical abnormalities. Diagnostic criteria are often loosely applied in the clinical setting, and the underlying cause is never defined in many individuals. Bile acid malabsorption has also been documented in up to a third of individuals with IBS[2,5].

There are indications that sex hormones - estrogen and progesterone, influence irritable bowel syndrome[6,7]. Receptors for these hormones have been found on gastrointestinal cells, which suggest that the gastrointestinal tract is designed to sense and react to them[7]. Several systematic changes in gastrointestinal symptoms occurs at the times in their menstrual cycle when the amounts of these hormones in the blood change most. Symptoms such as stomach pain, diarrhea, nausea, and bloating are generally greatest during menses, when estrogen and progesterone drop down to the lowest levels in the body[8,9].

Bloating is the only IBS-type symptom which also seems to be worse during the second half of the cycle before the beginning of menses[8]. Some researchers also found that, women who have IBS-type symptoms also appear to experience worse menstrual symptoms, such as water retention and concentration difficulties, compared to other women[9].

Also some reporters observed that pain sensitivity in the gut, which is a key factor in IBS, play a role in the increase in symptoms due to hormonal changes during reproductive age. Epidemiological data suggest that IBS in women becomes less common after menopause[10,11]. In a national survey of 5430 householders in the United States, was found that the frequency of IBS decreased after age 45 in women[12]. Similar trends have been reported in the United Kingdom (UK) and Germany that document an age-related decrease in IBS in women after age 50–65, although symptoms may worsen in the premenopause[13]. British data also showed that IBS by women, which are generally more common in premenopausal women than post-menopausal women. The decline in IBS after menopause indicates again that sex hormone fluctuation plays a part in producing the symptoms, because such fluctuations cease after menopause[14].

Women with IBS report significantly more abdominal pain, bloating, intestinal gas, constipation, and diarrhea at the time of menses compared to premenopausal women. Researchers also found that 50% of female IBS patients compared to 34% of non-IBS patients reported worsening bowel symptoms during menses. So, it was reported that IBS patients suffered worse stomach pain, nausea, and diarrhea during menses compared to healthy reproductive controls[15].

METHODS

This is a cross sectional analytical study was conducted in Department of Medicine at Prime Medical College & Hospital in Rangpur, Bangladesh from July 2019 to June 2020. A total number of 100 subjects, aged 30 to 40 years of premenopausal women and 50 to 60 years of post-menopausal women were included in this study. Among them 50 were premenopausal and 50 were post-menopausal women. All subjects were socio-economical condition matched. The objectives, nature, purpose and benefit of the study were explained to the subjects in details. Informed written consent were taken from all participants. All the subjects were excluded from kidney diseases, liver diseases, other chronic and acute illness.

All relevant information's were recorded in a

predesigned questionnaire. Collected data were compiled and analyzed by using computer-based software, statistical package for Social Science (SPSS 23.0 version). Chi-Square test was used for statistical analysis and p value less than 0.05 was considered as significant.

RESULTS:

There was a significant difference of developing IBS symptoms in pre and post-menopausal women.

Clinical features	Premenopausal women	Postmenopausal women	p value
Dyspepsia	42(84%)	12(24%)	0.001 ***
Bloating	39(78%)	10(20%)	0.001***
Abdominal pain	41(82%)	9(18%)	0.001 ***
Diarrhea	36(72%)	10(20%)	0.0 01***
Constipation	35(70%)	15(30%)	0.01 **

*****=p<0.001, **=p<0.01**

DISCUSSION

In the present study, prevalence of IBS is significantly more in premenopausal women than post-menopausal women. This finding is consistent with that of some other investigators[16, 17, 18]. Also some other researchers did not find any significant change of prevalence of IBS[19].

The exact mechanism of more prevalence of IBS symptom in pre-menopausal women is yet to be elucidated. In premenopausal women there is increased level of sex hormone estrogen and progesterone than post-menopausal women. Also in menstrual period there is change of the level of hormone and also release of some other hormone like prostaglandin, endothelin. There is effective hormonal influence in premenopausal period. This hormonal influence causes increased production of symptom of IBS in permenopausal period than post-menopausal[20]. Sex hormone fluctuation in reproductive period play a part in producing the symptoms of IBS but such fluctuations cease after menopause. That causes decline in IBS symptom after menopause[21].

Symptoms such as stomach pain, diarrhea, nausea, and bloating are greatest during menses, when estrogen and progesterone drop down to the lowest levels in the body. Bloating is the only IBS-type symptom which also seems to be worse during the second half of the cycle[22].

Sex hormones, particularly estrogen and progesterone, influence irritable bowel syndrome. Receptors for these hormones have been found on gastrointestinal cell. These

receptors are stimulated in response to hormonal fluctuation during menstruation that lead to more symptoms of IBS[23]. Estrogen, TNF, endothelin, and prostaglandins also exert effects on the GI tract. Estrogen receptors are found throughout the GI tract in components of the pelvic floor and in sensory neurons of the dorsal root ganglia, suggesting that female sex hormones may play a role in IBS symptomatology. Also, these hormones have a relaxing effect on the lower esophageal sphincter and decrease colonic transit[24].

TNF induces inflammation, delays gastric emptying, increases colonic transit time, and induces flow of fluid into GI tissues. Endothelin has potent effects on GI smooth muscle, leading to contraction of the esophagus, stomach, and intestines, and has a modulatory effect on GI motility[25,26].

In the gut, prostaglandins, implicated in the proper maintenance of mucosal blood flow, stimulation of the mucous secretion lining the gut surface, stimulation of GI motility, and secretion of bicarbonate to help neutralize acids. Altered prostaglandin levels can result in abdominal pain, colonic contractions, and diarrhea[26].

In the present study, prevalence of IBS is more in premenopausal period than postmenopausal period due to altered changes of sex hormone in reproductive period.

CONCLUSION:

It can be concluded from the present study that; prevalence of IBS is significantly increased in perimenopausal women than post-menopausal women.

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Original article

Roll of Chlorhexidine versus Povidone Iodine as Preoperative Skin Preparation to Control Surgical Site Infection in Clean and Clean Contaminated Surgery

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ABSTRACT

BACKGROUND: *Surgical site infection, one of the major complications that develop in patients after surgery and also the most common nosocomial infection undergoing surgery and carrying significant morbidity and mortality. As patients themselves are incapable of complete sterilization by an appropriate procedure, therefore preoperative skin preparation is the only way. Several antiseptic agents are available for preoperative preparation of the skin at the incision site including iodophors and alcohol containing products like chlorhexidine gluconate (CHG). Povidone iodine (PVI) and CHG are well known antiseptics which are used for surgical site skin preparation.* ***OBJECTIVES:*** *To determine whether chlorhexidine or povidone iodine should be the preferred agent for cleansing the skin before clean and clean contaminated surgery.* ***METHODS:*** *This cross sectional comparative study was conducted on 100 patients of which 50 patients had skin preparation with chlorhexidine and 50 patients had skin preparation with povidone iodine. Outcome variable was wound infection.* ***RESULTS:*** *Wound infection was compared to both groups of patients. Total 38(19%) wound infections were detected. Among the group-I (who got chlorhexidine), 41(82%) patients had satisfactory healing and among the Group-II (who got povidone iodine), 40 80%) patients had satisfactory healing. There is no statistically significant difference of wound infection between the two groups of patients.* ***CONCLUSION:*** *The outcome of surgical site infections in case of skin preparation by chlorhexidine or povidone iodine were same.*

KEY WORDS: Povidone iodine, Chlorhexidine, Wound infection.

INTRODUCTION

Surgical site infections (SSI) are one of the major complications that develop after surgery in surgical patients and most common nosocomial infection, carrying significant morbidity and mortality rates[1]. SSIs are the third most frequently reported health care associated infection based on data derived from the Centers for Disease Control and Prevention's (CDC); National Healthcare Safety Network[2]. There are considerable medical and health care implications associated with SSIs, including increased mortality, longer lengths of hospitalization, higher rates of reoperation and re-admission and ultimately higher healthcare costs[1-3]. The CDC has recognized and differentiated SSIs into superficial incisional (above the fascia), deep incisional (at or below the fascia) and organ

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space[4]. There are numerous risk factors associated with the development of SSIs related to the patient, environment and the treatment provided[5-7]. It has been recognized that the most important source of pathogens causing SSI is neither the operating surgeon and instruments nor the environment but the patient's own microbial flora[8].

As patients are incapable of complete sterilization so an appropriate procedure should be preoperative preparation of skin. Since one cannot resort, as in case of operation's hand to prolonged scrubbing, soaking in germicides etc. One should find chemical agents powerful enough practically to sterilize the skin by local application. Such antibacterial agents must fulfill chemical criteria including spectrum of activity, tissue tolerance and absence of acquired bacterial resistance. In addition, the antibacterial agent tought to be presented in a formulation appropriate to surgical use[9].

Many techniques are there for skin preparation before surgery, the commonest being initial scrub with antiseptic soap solution, followed by painting the prepared area with antiseptic paint solution but de-germing of the skin can be done with antiseptics used for less than one minute, which is as effective as a five-minute scrub with germicidal soap solution followed by painting with antiseptics[10]. An effective preoperative skin antiseptic is an agent that rapidly reduces the number of transient and resident microorganisms in the surgical field before wound incision and suppresses rebound growth for six hours after application[11-13]. Several antiseptic agents are available for preoperative preparation of the skin at the incision site including iodophors and alcohol containing products like chlorhexidine gluconate (CHG)[14]. Povidone iodine (PVI) and CHG are well known antiseptics which are used for surgical site skin preparation[15-16]. This study was conducted to determine whether povidone iodine or chlorhexidine should be the preferred agent for cleansing the skin before clean and clean contaminated surgery.

METHODOLOGY

Study population: All patients who had undergone elective operation at the Department of Surgery of Prime Medical College Hospital from 1st January 2017 to 31st December 2017 and fulfilled inclusion and exclusion criteria have been taken as study population.

Inclusion criteria: All clean and clean contaminated surgery of the patients of the age between 18-60 years of both sexes.
Exclusion criteria: Contaminated and dirty operations, emergency operations, patients with DM, uraemia, immunosuppression, having corticosteroid therapy, BMI <18 or> 25.
Study design: Cross sectional comparative study.

Sample size: A sample of 50 in each study group (a total of 100 patients) was conducted considering 5% significance level, 9% precision level and considering the incidence of 10% wound infection in clean-contaminated operation[17].

Sampling: Convenient, consecutive and exhaustive sampling.

Outcome variable: Wound infection.

METHOD

After the enrollment of patients into the study population were divided randomly into group-I

and group-II. Patients of elective operations who fulfilled inclusion and exclusion criteria were given an arbitrary number, each odd number of patients was included as group-I and even number of patients was included as group-II.

All the patients were assessed before operation by history taking, physical examination and necessary investigations. Hb%, RBS, serum urea and creatinine were estimated of each patient to exclude anaemia, diabetes mellitus, uraemia respectively. Patients BMI were measured by measuring height and weight of the patient and calculating BMI.

Patients were searched for any focal source of sepsis. They have been informed about the purpose of data collection and written consent has been taken. They were asked to take a preoperative showering before the day of operation. Shaving of the patient was done on the table just before incision. Before draping, preoperative skin preparation of group-I patients were done with chlorhexidine for 30 seconds and skin preparation of group-II patients were done with povidone iodine for 30 seconds. Other aseptic procedures during operations were performed in both groups as a standard method.

In all cases diathermy was used for haemostasis and drainage tubes were inserted (if necessary) through a separate stab wound. If any discharge from the wound was present, it was collected and was sent for bacteriological examination and antibiotics were changed according to culture and sensitivity report. Adequate postoperative analgesia was ensured and patients were encouraged for early mobilization. Patients were followed up on 3rd to 7th postoperative day and regularly examined for surgical site infection on the basis of ASEPSIS score[18].

RESULT

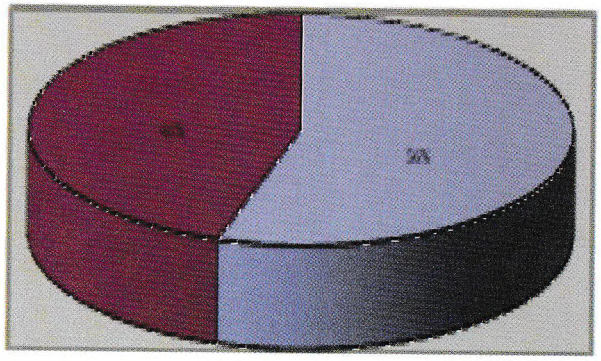
The mean age of group-I and group-II are 35.56 (SD-10.88) and 40.44 (SD-10.66) respectively. There is no significant difference of age in both groups of patients.

Table – I: Age distribution of both groups of patients –

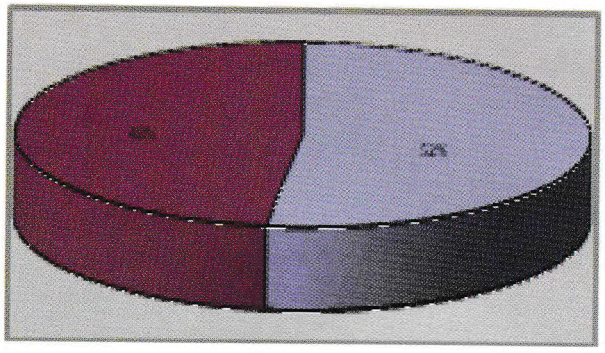
Age	Group - I		Group – II		P
	Frequency	Mean (SD)	Frequency	Mean (SD)	
17 – 30	18	21.3 (10.1)	8	22.1 (9.42)	>.0
31 – 40	16	36.4 (6.22)	17	37.21 (7.11)	01
41 – 50	14	43.5 (8.41)	16	45.71 (3.47)	
51 – 50	2	52.1(3.21)	11	54.21 (4.25)	

In the group-I, there were 28 (56%) male patients and 22 (44%) female patients. In the group-II, there were 26 (52%) male patients and 24 (50%) female.

Fig – 1: Graphical Presentation of Sex Distribution



Group - 1



Group - 2

Table II: Mean BMI Hb% in both groups.

Parameters	Group – I (Case) n=50	Group – II (Control) n=50	p
BMI	19.72 (1.73)	19.67 (1.06)	> 0.05
Hb%	11.9 (1.8)	12.1 (1.5)	> 0.05

The mean BMI of group-I patients was 19.72 (1.73) and group-II was 19.67 (1.06). The difference of mean BMI of group-I and group-II patients was not statistically significant.

The mean haemoglobin level of group-I patients was 11.9 (1.8) and group-II patients was 12.1 (1.5). The difference of mean haemoglobin level of group-I and group-II was not statistically significant.

Categorization of wound infection were out of 100 patients, 81 patients had found satisfactory healing and 19 patients had found from disturbance of healing to severe wound infection all were shown in table III.

Table – III: Different categories of wound infection (According to the ASEPSIS score18)

Condition of wound	Group -I	Group - II	Total
Satisfactory healing	41 (82%)	40 (80%)	81 (81%)
Disturbance of healing	4 (8%)	5 (10%)	
Minor wound infection	3 (6%)	2 (4%)	19 (19%)
Moderate wound infection	2 (4%)	3 (6%)	
Severe wound infection	0 (0%)	0 (0%)	

According to opereation in both groups the patients were distributed as shown in table IV. In the group-I; 23 patients had cholecystectomy, 16 had gastrojejunostomy, 4 had choledecholithotomy, 2 had resection and anastomosis of small gut and 5 had interval appendicectomy. In the group-II; 21 patients had cholecystectomy, 18 had gastrojejunostomy, 4 had choledecholithotomy, 3 had resection and anastomosis of small gut and 4 had interval appendicectomy. There is no statistically significant difference in between 2 groups of patients.

Table – IV: Distribution of patients according to the operation

Operation	Group - I	Group - II	p
Cholecystectomy	23	21	
Gastrojejunostomy	16	18	
Choledecholithotomy	4	4	>.05
Resection & anastomosis	2	3	
Interval appendicectomy	5	4	

The length of incision site during operations were shown in Table V below. Among the group-I; 15 patients had 7-8cm incision, 14 had 9-10cm, 12 had 11-12cm, 6 had 13-14cm and 3 had 15-16cm. Among the group-II; 16 patients had 7-8cm incisions, 16 had 9-10cm, 12 had 11-12cm, 4 had 13-14cm and 2 had 15-16cm. No significant difference is found between the lengths of incision of both groups of patients.

Table – V: Distribution of operations according to length of incision

Length of incision (cm)	Group - I	Group - II	p
7-8	15	16	
9-10	14	16	
11-12	12	12	> .05
13-14	6	4	
15-16	3	2	

Overall duration of time required in surgery procedure were given in Table VI. Among the group-I; 21 patients had duration of operation 41-50 minutes, 6 had 51-60 minutes, 14 had 61-70 minutes, 3 had 71-80 minutes and 6 had 81-90 minutes. Among the group-II; 18 patients had duration of operation 41-50 minutes, 9 had 51-60 minutes, 14 had 61-70 minutes, 4 had 71-80 minutes and 5 had 81-90 minutes. No statistical difference is found between the duration of operation of both groups of patients.

Table – VI: Distribution of operations according to the duration

Duration of operations (in minutes)	Group - I	Group - II	p
41-50	21	18	
51-60	6	9	
61-70	14	14	> .05
71-80	3	4	
81-90	6	5	

Patients of both groups were distributed according to preoperative hospital stay is shown in Table VII. Among the group-I; 4 patients had preoperative hospital stay 6-10 days, 16 had 11-15 days, 12 had 16-20 days, 12 had 21-25 days, 4 had 26-30 days and 2 had 31-35 days. Among the group-II; 4 patients had preoperative hospital stay 6-10 days, 12 had 11-15 days, 14 had 21-25 days, 4 had 26-30 days and 2 had 31-35 days. There is no statistically significant difference between the hospital stay of both groups of patients.

Table – VII: Distribution of patients according to preoperative hospital stay

Preoperative hospital stay (days)	Group - I	Group - II	p
6-10	4(8%)	4(8%)	
11-15	16(32%)	12(24%)	
16-20	12(24%)	14(28%)	> .05
21-25	12(24%)	14(28%)	
26-30	4(8%)	4(8%)	
31-35	2(4%)	2(8%)	

Wound infections of both groups of patients are compared and shown in Table VIII. In the group-I, 41 patients had satisfactory wound healing, 4 had disturbance of healing, 3 had minor wound infection and 2 had moderate wound infection. In the group-II, 40 patients had satisfactory wound healing, 5 had disturbance of healing, 2 had minor wound healing and 3 had moderate wound infection. There is no significant difference of wound infection between the two groups of patients.

Table – VI: Distribution of operations according to the duration

Sample	Group - I	Group - II	p
Satisfactory healing	41	40	
Disturbance of healing	4	5	> .05
Minor wound infection	3	2	
Moderate wound infection	2	3	

DISCUSSION

The potential for infection depends on a number of patient variables such as the state of hydration, nutrition and existing medical conditions as well as extrinsic factors, for example related to pre-, intra-, and postoperative care if the patient has undergone surgery[19]. This often makes it difficult to predict which wounds will become infected. Consequently the prevention of wound infection should be a primary management objective for all healthcare practitioners[20]. Preparation of skin prior to operation is also a causative factor of wound infection. In this study, both study and control group of patients were distributed according to age and there was no significant difference of age variation between the groups. Again, regarding BMI and Hb% no statistical difference was found between the groups of patients.

In our study, the total infection rate was 19%. It is higher than the international standard. This may be due to overcrowding of the hospital. In a study, surgical site infection rate was 3.03% in clean surgeries and 22.41% in clean-contaminated surgeries[19]. In a study it has been observed that the small skin incision, if associated with prolonged operation time, may increase the overall insult in pediatric cardiac surgery[20]. So in this study some of the confounding variables like length of incision, duration of operation, preoperative hospital stay were compared between two groups of patients, which showed no significant difference between the groups. In a study, it was concluded that duration of operations at least partially determined by hospital factors and consequently, should be used as a quality indicator to compare SSI infections between hospitals, rather than being used as a patient factor to adjust comparisons between hospitals[21].

In our study, we compared the infection rate of patients who have skin preparation with Chlorhexidine and the patients who have skin preparation with Povidone Iodine. No statistical significant difference was found between the groups. Darouiche et al. (2010) used chlorhexidine-alcohol versus povidone iodine for surgical-site antisepsis. They indicated that the infection rate of surgical site was significantly lower in the chlorhexidine-alcohol group compared to the povidone iodine group (P = 0.004)[22]. Likewise, Mimoz et al. (1999) showed that skin preparation with chlorhexidine-alcohol was more efficient than povidone iodine in

reducing contamination of blood cultures[23]. In a similar study, Suwanpimolkul et al. (2008) reported that the contamination rate of blood cultures was significantly lower after disinfecting the venipuncture site with chlorhexidine-alcohol 2% than with povidone iodine 10% ($P < 0.001$). This difference may be due to the presence of alcohol in chlorhexidine preparation[24].

CONCLUSION

From this study it may be concluded that there werte same outcome of surgical site infection in case of skin preparation by chlorhexidine or povidone iodine. Again this study were done on a limited scale. Further study with large scale sample size may give more conclusive findings.

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Original Article

Soft Tissue Defect Of Scalp Following High Voltage Electric Burn –reconstructive Challenge and Our Experience.

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ABSTRACT:

BACKGROUND: *Electrical burns are potentially devastating injuries & Scalp reconstruction following high voltage electric burn can be challenging. A useful Reconstructive algorithm is lacking.* ***OBJECTIVES:*** *The purpose of this study was to evaluate our experience and to identify an appropriate reconstructive strategy.* ***METHODS:*** *This was a prospective observational study, conducted in the Burn & Plastic Surgery department of Dhaka medical college hospital over a period of four years. Reconstructive procedures, independent factors and outcomes were evaluated. A total of 5 procedures were performed in 40 patients. Techniques for reconstruction included skin grafting, Rotation flap, Double opposing flap, Transposition flap and Free flap.* ***RESULTS:*** *Among 40 patients, 32 were male and 08 were females, with male to female ratio of 4:1. Most of the patient's age ranged from 25-30 years. Bone was exposed in 29 cases. Among 40 patients, 31 patients had injuries to other sites of the body, 4 patients had head injury. Transposition flap was the most common procedure performed (47.5 %). While skin grafting was the 2nd commonest procedure performed (27.5 %) in this series of patients. All the defects were >3 cm, so primary closure was not possible in any cases. In 02 cases defects were extensive and covered with Latissimus Dorsi muscle flap.The postoperative complications seen in this series includes discharging sinus in 01 cases, Partial Flap necrosis in 01 case, Partial Graft loss in 02 case and Wound infection in 04 case.* ***CONCLUSION:*** *Important tenets for successful management of scalp defects are durable coverage, timely adequate debridement, preservation of blood supply, and proper wound care. Local scalp flaps with skin grafts remain the mainstay of reconstruction in most instances.*

Key Words: Electric burn, Scalp defect, Local flap, Reconstruction.

INTRODUCTION:

The scalp is unique as structure, the highest point of the body, most exposed and usually uncovered by clothing. These factors make it vulnerable to electric burns. Electrical burns are potentially devastating injuries and most often occur at the workplace[1]. Being exposed, mild degree of scarring is easily noticeable and lead to disfigurement. Nevertheless, most of the scalp is relatively inelastic; repair of even small defect is difficult and is ideally reconstructed with hair bearing skin. Primary closure of wounds greater than 3 cm is often not possible. Alopecia is easily noticeable and greater aesthetic concern. These properties compromise the ease of effective reconstruction and affect

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the surgeon's ability to reconstruct defects in this area. Therefore the decision making process behind a successful outcome requires a solid knowledge of anatomy, a clear evaluation of the defect and the knowledge of a variety of reconstruction options available and skin biomechanics. Multiple reconstructive options exists that includes, primary wound repair, healing by secondary intention, use of skin grafts, local tissue flaps, regional flaps, and micro vascular free flaps. While considering reconstructive options the plan must always be tailored to the individual patient's needs and due attention be given to the aesthetic outcome that specially includes preservation of the hairline and hair follicle orientation, scar camouflage, avoidance of alopecia, and secondary restoration of alopecia[2,3,4,5]. Tissue expansion is also one of the most important armamentaria for aesthetic scalp reconstruction[6]. But it`s use in electric burn is limited.

The objective of our study is to see the outcome of different reconstructive procedures performed to cover the soft tissue defect of scalp following high voltage electric burn.

METHODS:

This prospective observational study was conducted in the Burn and Plastic surgery Department of Dhaka Medical College Hospital from May 2015 to June 2019. During the study period 40 patients with soft tissue defect of scalp were managed. Patients were included in the study after obtaining an informed consent. All the study variables were collected on pre designed proforma such as age, sex, procedure performed and complications noted. The data was compiled, computed through SPSS 17 version for windows.

RESULTS:

Among 40 patients, 32 were male and 08 were females, with male to female ratio of 4:1. Most of the patient's age ranged from 25-35 years (table I). The mean size of the defects in its longest dimension was 7.50 cm. Bone was exposed in 29 cases. Among 40 patients, 31 patients had injuries to other sites of the body, 4 patients had head injury (Table II). All patients underwent through surgical debridement. Transposition flap (Fig.3) was the most common procedure performed (47.5 %). While skin grafting (Fig.2) was the 2nd commonest procedure performed (27.5 %) in this series of patients (Table-III). Scoring of galea required in 05 cases and back cut required in 03 cases to facilitate the repair of scalp. When the defect was not typically triangular conventional design of transposition flap may not work. In such case back cut as well as scoring of galea facilitates tensionless closure. In 05 cases of small defects, wounds were covered by rotation flap without skin grafting to the donor site. Transposition flaps required skin grafting in the donor area. The postoperative complications (Table-IV) seen in this series includes discharging sinus in 01 cases, Partial Flap necrosis in 01 case, Partial Graft loss in flap donor site (Fig.4) in 02 case and Wound infection in 04 case. In one case of discharging sinus, cause was presence of sequestrum underneath the flap. The sequestrum was removed and flaps re insetted. Partial Graft loss wound was healed by secondary intension. Wound infection respond well to the conservative management that includes antiseptic dressings and use of antimicrobial agents but resulting in broad scar.

Sex distribution

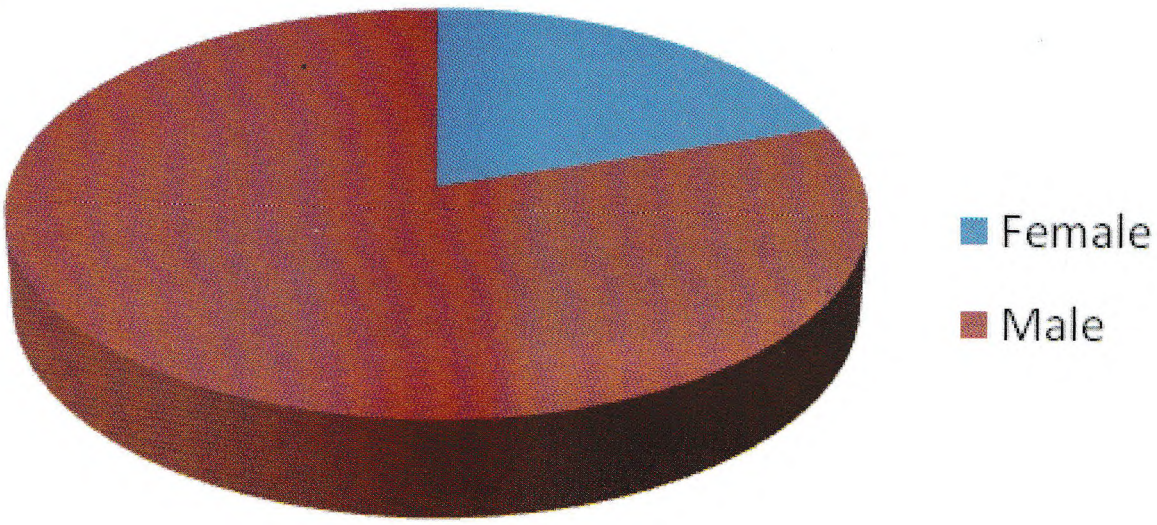


Fig 1: Pie chart showing male female ratio

Table-I: Age Incidence of Patients (in year)

Sl No	Age frequency	No of patients
1	< 20	02
2	21 - 25	03
3	26- 30	09
4	31-35	18
5	36-40	06
6	>40	02

Table-II: Pattern of injury

SL. No	Injury	No of patient
1	Bone exposure	29
2	Associated head injury	04
3	Injury to other parts of body	31

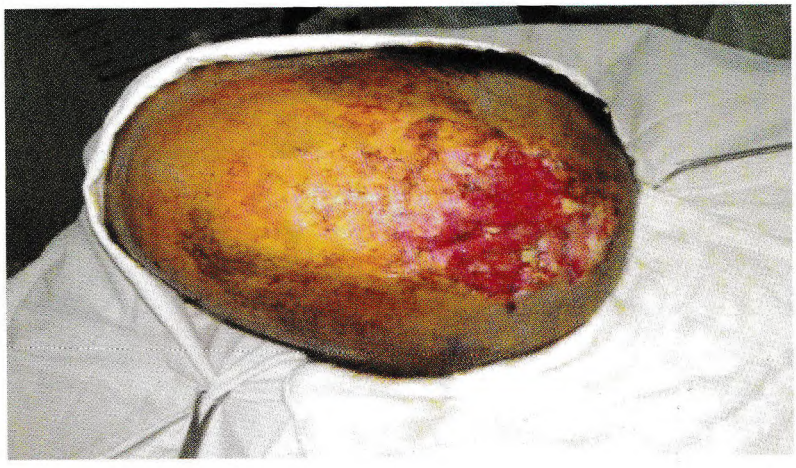
Table-III: Types of Procedures Performed

Sl. No.	Name of procedure	Number of patient	Parcentage (%)
1	Skin grafting only	11	27.5%
2	Transposition flap	21	52.5%
3	Rotation flap	05	12.5%
4	Double opposing flap	02	5%
5	Free flap	01	2.5%

Table-IV: Complication of surgery

Sl. No.	Complication	Number of patient
1	Partial Graft loss	02
2	Partial Flap necrosis	01
3	Discharging sinus	01
4	Wound infection	04

Fig.1 (a-c): Rotation flap



A
Defect



B
After excision, intact pericraneum



C
Skin graft placement

Fig. 2 (a-c): Skin graft



A
Defect with exposed bone



B
after excision



C
after flap coverage

Fig. 3 (a-e): Transposition flap



A
Defect



B
After flap insetting



C
on 5th post operative day



D
On 5th POD, donor site



E
On 5th POD flap

Fig.4: Partial skin graft loss



DISCUSSION:

Electrical burns are less common than thermal burns and are associated with high morbidity and mortality. Typically, they occur at work-place due to non-usage of protective equipment and lack of attention or with theft of copper earthing wires[9]. The management of scalp defects remains a continuous challenge to the reconstructive surgeon worldwide[10]. Most of the patients in our study were males. This reflects the fact that male while performing most of outdoor activities are more prone to electric burn injuries, and females of our society remain at home for domestic affairs are largely protected. Initially patients are resuscitated according to ATLS guide line. A multi staged surgical approach followed in all the patients. In the initial stage, wound excision was performed in all the cases. Multiple dressings required from resuscitation to definitive procedure. Tetanus prophylaxis was ensured. After full resuscitation and hemodynamic stability patient was scheduled for definitive procedure. After debridement, early surgical attempt to cover provides short hospital stay and low rate of infection[11]. Most of the patient had undergone through multiple surgical procedure, so total hospital stay was consider in this study. Transposition flaps were performed in majority (52.50%) of patients. These flaps were raised based on major vessels supplying the scalp. The flaps were raised through the sub galeal plane preserving the periosteum. In case of central defects, double opposing rotation flaps were used. In cases of circular defects, rotation flaps were used. Skin grafting were performed in those cases where pericraneum were intact and it`s the second highest (27.50%) procedure performed. In one case defect was extensive and covered with free Latissimus Dorsi muscle flap. The morbidity in all of these cases was not so much, however few of the complications like Discharging sinus, Partial Flap necrosis, Partial Graft loss and Wound infection were present. In one case of discharging sinus, cause was presence of sequestrum underneath the flap. The sequestrum was removed and flaps re insetted. Partial Graft loss over flap donor site was healed by secondary intension. Wound infection

respond well to the conservative management that includes antiseptic dressings and use of antimicrobial agents but resulting in broad scar. Similar study was performed by Memon et al [12]. In their study multiple factors were responsible for scalp defects. On the other hand, we considered only the electric burn patients. By their study, Skin grafting alone or in combination with other technique was the most common procedure for repair of the scalp defects. In our study, Transposition flap was the commonest procedure to cover the scalp defect, and Skin grafting was the second commonest procedure performed. In another study, Newman MI et al 5 performed scalp reconstruction in 64 patients over 15 years, the defects were caused by multiple factors and the techniques of reconstruction were Primary closure, Skin grafting, local and distal flaps. In defects less than 3 cm in diameter, direct closing is suitable9. In this series all the defects were >3 cm, so primary closure was not possible. In our study, we performed one distant flap as free tissue transfer and the flaps were Latissimus dorsi muscle flap.

CONCLUSION:

Adequate surgical debridement, meticulous surgical technique and selection of flaps are the mainstay of management. In this study, Transposition flap and skin grafting were the preferable forms of reconstruction. Careful analysis of the defect and local tissues can help tailor the method of reconstruction and result in satisfactory closure in a majority of patients.

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Original Article

Thyroid Function Status in Dyslipidemia among HealthyYoung Female Medical Students in Dhaka.

Dr. Al Aharama[1], Dr. Md. Abu Sayed[2], Dr. Sadia Khanduker[3].

BACKGROUND: *Dyslipidemia is highly prevalent among women. Thyroid disease is associated with abnormal lipid profile which may lead to atherosclerosis. Thyroid stimulating hormone (TSH), free triiodothyronine (FT3) and free thyroxin (FT4) are recognized as regulators of lipid synthesis, mobilization and degradation.* ***OBJECTIVE:*** *To assess the association of thyroid dysfunction with lipid abnormalities among healthy young female medical students in Dhaka.* ***METHOD:****This cross sectional study carried out in the Department of Biochemistry at Bangabandhu Sheikh Mujib Medical University, Dhaka. This study was conducted from January, 2014 to December, 2016. All young female medical(1st year to 5th year) studying at a collegewere selected as study population for these analysis after exclusion of subjects with present or previous thyroid disorder. The young female students with or without dyslipidemia studying at a medical college 18-25 years of age were included for this study. After taking the consent the physical and anthropometric characteristic of the students were taken by the researcher herself.Student's t test, Z test, Correlation Coefficient test were performed by using SPSS versions 15.0 for windows.* ***RESULT:*** *In normolipidemia group, 92.0% hadeuthyroid respondent followed by 4.0%subclinical hyperthyroidism and 4.0% had sub clinical hypothyroidism. In dyslipidemia group, euthyroid 88.8% is most common followed by subclinical hypothyroidism 8.0% and overt hypothyroidism 3.2%. In dyslipidemia group, r value of TC, TG, HDL with TSH , FT4 and FT3 are 0.136, 0.222 , -0.068 and-0.093, -0.131, -0.139and-0.068, 0.151, -0.065 respectively. TSH level is increased in dyslipidemic group than in normolipidemic group.* ***CONCLUSION:*** *Overweight is one of the most important problem among the medical students of our country. In this study, thyroid dysfunction is not significantly associated with dyslipidemia among female medical students of medical college in Dhaka city.*

Key word: Dyslipidaemia, hypothyroidism, TSH, FT4, FT3.

INTRODUCTION:

Dyslipidemia is one of the most importantcomponents of metabolic syndrome. The management of dyslipidemia is the cornerstone in the prevention of both primary and secondary cardiovascular disease[1,2]. Previous studies revealed that increasedrisk ofdyslipidemia is associated with atherosclerotic cardiovascular disease. Atherosclerotic cardiovascular disease is one of the cause of death forwomen in US[3]. Thyroid disease is associated with abnormal lipid profile, may lead to atherosclerosis and it is estimated that 1.3% to 12% of patients with hypercholesterolemia have hypothyroidism[4,5]. One in every two women die of a heart related disorder which may represents more deaths than

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due to cancer, chronic lung conditions and accidental combined[6]. Gender and age can influence the relationship between lipid profiles and thyroid function[7]. Thyroid hormone regulates the various process of metabolism including synthesis, mobilization and degradation of lipid[8,9,10]. Togini et al[7] revealed that age was most crucial factor for influencing serum cholesterol, and TSH second important factor following age. This research found that both age and TSH could influence significantly in females either TC or low density lipoprotein cholesterol. Females are more vulnerable to thyroid dysfunction typically overt and subclinical hypothyroidism and prevalence rises with age[11-14]. Patients with overt hypothyroidism areconsistently associated with elevated level of cholesterol and triglycerides (TG), while hyperthyroid patients show reduced levels of lipid[5,15]. Some studies shown there is any alteration in lipids in case of subclinical hyperthyroidism, suggesting that thyroid hormone and thyroid stimulating hormone (TSH) exert independent effects on lipid metabolism[16,17]. The Duntas LHstudy[18] showed a significantly positive correlation between TC and TSH, as well as LDL and TSH , in both sex. However, in women, if adjustment was made by age and BMI, these relationships became not significant. The effects of the interaction between T3,T4 and TSH in association with lipid profile is not possible to exclude but many evidence indicates that thereis association is partially related to direct effect of TSH on the lipid profile and is also associated with metabolic syndrome[19,20].

Finally, There is any alterations of the lipid profile are commonly observed in patients with thyroid dysfunction, current knowledge, is insufficient relationship between lipids and both thyroid hormones and TSH. Thus, the objectives of this study was to association between dyslipidemia and thyroid disease among healthy young female medical students of Dhaka.

METHODS:

This cross-sectional study was carried out in the Department of Biochemistry at Bangabandhu Sheikh Mujib Medical University, Dhaka from January, 2014 to December, 2016 for a period of two years. All young female medical students aged 18-25 years (1st to 5thyears) studying at a medical college were selected as study population. Written consents were obtained, and the institutional reviewboard and ethic committee of Bangabandhu Sheikh Mujib Medical University approved this study.

Measurements Anthropometric and biochemical parameters with full aseptic precaution 5ml venous blood from each of the 200 students was collected after an overnight fast of at least 12 hours in a disposable syringe and was delivered into a clean dry plastic test tube. Then serum was separated after centrifuging at 2000 rpm for 15 minutes and stored in ultra-freezer at -35°C until analytical measurement of blood glucose, serum total cholesterol, serum triglyceride, HDL, LDL & TSH, FT3, FT4 were done at the Department of Biochemistry, BSMMU.

TSH, FT3 and FT4 were performedby using Micro particle enzyme immunoassay (Axsym system, Abbott Co.Ltd.) according to manufacturer's instructions. The reference values that were considered normal were 0.3 to 5 mIu/L, 10-24 pmol/L for FT4 and 4.6 to 9.7 pmol/L for FT3.

Estimation of serum fasting TG by enzymatic (GPO-PAP) method (Bucolo & David 1973),TC by CHOL method (Siemens Health-

care Diagnostics Inc.2008) and serum HDL Cholesterol by Homogenous/Direct method (Lin et al 1998). For those TG value below 400mg/dl,low density lipoprotein cholesterol (LDL-C) was calculated with Friedewald equation[21].Body mass indexwas calculated as (Weight in kg/Height in m^2).

STATISTICAL ANALYSIS:

Data were collected using a preformed data collection sheet. Collected data were checked processed and analyzed with the help of software-SPSS (Statistical package for windows version 15.0.The result were expressed as mean ± SD (standard Deviation) and proportion. Probability value <0.05 was considered as level of significance. Student's t test, Z test, Correlation Coefficient test has been performed for comparison between quantitative variables. The summarized data was interpreted accordingly and was then presented in the form of tables.

RESULTS:

A total of 200 subjects are classified into dyslipidemic and normolipidemic group according to their serum total cholesterol, TG, HDL-C and LDL-C. Seventy five were normolipidaemic and 125 were dyslipidemic.

Table I : Physical& Anthropometric characteristic of study subjects (n=200)

Parameters of Physical Examination	Group		p value
	Normolipidemia (n=75) Mean ± SD	Dyslipidemia (n=125) Mean ± SD	
Age	21.12 ± 2.07	21.14 ± 1.96	0.935
Height (cm)	153.8 ± 9.2	158.0 ± 8.0	0.001
Weight (kg)	64.26 ± 10.45	72.99 ± 15.39	0.001
BMI	26.95 ± 4.40	28.81 ± 4.31	0.004
WC	83.82 ± 7.90	89.93 ± 10.95	0.001
Hip circumference	96.61 ± 9.54	103.25 ± 11.69	0.001
WH ratio	0.87 ± 0.04	0.87 ± 0.06	0.771
WHt ratio	0.54 ± 0.05	0.56 ± 0.06	0.008
Systolic BP	106.61 ± 8.33	111.36 ± 9.35	0.001
Diastolic BP	56.4 ± 5.48	58.32 ± 4.57	0.008

*t-test is done to measure the level of significance

Table I: Showsphysical, anthropometric characteristics and blood pressure of the normolipidaemic and dyslipidemic group by unpaired t test. Height, weight, BMI, waist circumference, waist hip ratio, diastolic pressure and hip circumference were found to be higher than in dyslipidemic group compared to normolipidaemic group.

Table II : Biochemical parameters of study subjects (n=200)

Biochemical parameters	Group		p value
	Normolipidemia (n=75) Mean ± SD	Dyslipidemia (n=125) Mean ± SD	
Serum fasting glucose	5.00 ± 0.41	5.15 ± 0.64	0.079
TC	166.57 ± 20.60	183.64 ± 40.89	0.001
TG	79.72 ± 27.87	127.53 ± 61.62	0.001
LDL-C	102.21 ± 19.30	124.80 ± 35.63	0.001
HDL-C	49.67 ± 7.53	34.53 ± 9.50	0.001

t-test is done to measure the level of significance

Table II: Shows biochemical findings of the study subjects. Here TC (P=0.001), TG (P=0.001), LDL-C (P=0.001) and HDL-C (P=0.001) were found to be significantly higher than in dyslipidaemic group compared to normolipidaemic group but serum fasting glucose concentration were normal in both group.

Table III: Distribution of respondents by Thyroid hormones status. (n=200)

Thyroid hormones	Group		p value
	Normolipidemia (n=75) Median (Min – Max)	Dyslipidemia (n=125) Median (Min – Max)	
TSH	2.42 (0.04-8.97)	3.64 (0.54 - 40.00)	0.234
FT4	14.14 (10.23-20.90)	13.94 (2.88-20.16)	0.779
FT3	3.74 (1.61-6.39)	3.49 (0.00 - 5.68)	0.051

Mann-Whitney U test is done to measure the level of significance.

Table III: shows the distribution of thyroid hormone between normolipidemic and dyslipidemic group by Mann-Whitney U test. Median of TSH in normolipidaemic group is 2.42 (.04-8.97) whereas in dyslipidemic group is 3.64 (0.54-40.00), difference between these two group was not statistically significant (P value =0.234). But TSH level is higher in dyslipidemic group than normolipidaemic group.

Table IV: Distribution of thyroid disorder among study subjects (n=200)

Thyroid disorder	Group		Z score	P value
	Normolipidaemia	Dyslipidaemia		
Yes	6 (8.0)	14 (11.2)	0.8246	0.984
No	69 (92.0)	111 (88.8)		
Total	**75 (100.0)**	**125 (100.0)**		

Z test is done to measure the level of significance

Table-IV: shows the thyroid disorder of the study subjects. In normolipidaemic group 8% respondents and in dyslipidemic group 11.2% respondents had thyroid disorder. The difference between these two group was not statistically significant (P=0.984). Thyroid disorder was more found in dyslipidemic group than in normolipidaemic group.

Table V: Types of thyroid disorder among study subjects (n=200)

Thyroid disorder	Group	
	Normolipidaemia N=75	Dyslipidaemia N=125
Overt hypothyroidism	0 (0.0)	4 (3.2)
Sub clinical hypothyroidism	3 (4.0)	10 (8.0)
Sub clinical hyperthyroidism	3 (4.0)	0 (0.0)
Euthyroid	69 (92.0)	111 (88.8)
Total	75 (100.0)	125 (100.0)

Parenthesis indicates percentage.

Table-V: shows the thyroid disorder between normolipidemic and dyslipidemic group. In normolipidaemic group 92.0% had euthyroid followed by 4.0% had subclinical hyperthyroidism and 4.0% subclinical hypothyroidism. In dyslipidemic group 88.8% had euthyroid followed by 8.0% subclinical hypothyroidism and 3.2% overt hypothyroidism.

Table VI: Correlation of TSH with BMI, WC, TC, TG, HDL (n=200)

Parameters	Group			
	Normolipidemia (n=75)		Dyslipidemia (n=125)	
	r value	p value	r value	p value
BMI	0.010	0.933	-0.024	0.789
WC	0.073	0.536	0.086	0.342
TC	0.181	0.119	0.136	0.130
TG	0.261	0.024	0.222	0.013
HDL-C	0.309	0.007	-0.068	0.449
LDL-C	-0.070	0.549	0.089	0.323

Table VI: shows correlation of TSH with BMI, WC, TC, TG and HDL-C and LDL-C. There was no significant correlation with BMI, WC, TC, TG and HDL-C and LDL-C.

Table VII: Correlation of FT4 with BMI, WC, TC, TG, HDL-C and LDL-C. (n=200)

Parameter	Group			
	Normolipidemia (n=75)		Dyslipidemia (n=125)	
	r value	p value	r value	p value
BMI	-0.040	0.731	0.064	0.483
WC	0.034	0.770	-0.043	0.633
TC	-0.101	0.387	-0.093	0.303
TG	-0.133	0.254	-0.131	0.146
HDL	-0.066	0.575	-0.139	0.123
LDL-C	0.007	0.950	-0.050	0.579

Table VII: shows correlation of FT4 with BMI, WC, TC, TG, HDL-C and LDL-C. There was no significant correlation with BMI, WC, TC, TG and HDL-C and LDL-C.

Table VII: Correlation of FT3 with BMI, WC, TC, TG, HDL-C and LDL-C. (n=200)

Parameter	Group			
	Normolipidaemia (n=75)		Dyslipidaemia (n=125)	
	r value	p value	r value	p value
BMI	0.022	0.849	0.083	0.357
WC	-0.006	0.958	0.144	0.109
TC	0.128	0.274	-0.068	0.454
TG	0.036	0.762	0.151	0.092
HDL-C	-0.086	0.463	-0.065	0.474
LDL-C	0.157	0.180	-0.073	0.419

Table- VII: shows correlation of FT3 with BMI, WC, TC, TG, HDL-C and LDL-C.There was no significant correlation with BMI, WC, TC, TG and HDL-C and LDL-C.

DISCUSSION:

The leading cause of mortality worldwide is atherosclerotic cardiovascular diseases due to persistent elevation of lipids levels in blood; the literature reports that more than 30% of the world's population suffer from dyslipidemia [22]. and very important cause of dyslipidemia is thyroid hormone dysfunction[4,5].

It has been reported that the incidence of hyperthyroidism is lower than 2.2% to 9.5% compared with hypothyroidism in the general population[12]. The high prevalence of hypothyroidism has been reported in different communities[13]. Indeed data from the third National Heath & Nutrition Examination survey (NHANES-III) showed a 4.6% prevalence of hypothyroidism in the general population, while 9.5% Colorado prevalence study participants had elevated levels of TSH[12].

Hypothyroidism is twice as common in women as in men[15]. It is commonly diagnosed in the elderly, whereas it is found less frequently in more youthful populations. It has been reported that by the age of 65 years, the overall prevalence of this disorder is about 17.0% in women and 7.0% in men[16].

Various type of thyroid dysfunction is caused by genetic and environmental factor[1]. It is expected that about 5.0% of Bangladeshi population are suffering from hypothyroidism and main bulk comprises the female[23]. Overall prevalence of hypothyroidism was 4.8% in men and 12.8% in women in an iodine sufficient area of Iran[24].

Hypothyroidism is the most common endocrine disorder in Bangladesh according to different studies on thyroid disorders in Endocrine Clinic of Bangabandhu Sheikh Mujib Medical University[25].

Hypothyroidism is aincreased risk factor for dyslipidemia due to hypercholesterolemia and atherogenic coronary artery disease[13,14,26]. It is the common cause of secondary dyslipidaemia[27]. Among all hypothyroidism sub clinical hypothyroidism usually action a risk factor to develop atherosclerotic cardiovascular disease, hyperlipidemia, low grade inflammation & hyper coagulability due to abnormality in lipid profile[28]. Increase levels of total and LDL cholesterol tend to decrease the thyroid function [12]. TSH distribution and reference limits shift to higher concentrations with age[29]. Several studies have shown hypothyroidism is associated with obesity, dyslipidemia due to hypercholesterolemia and increased risk of atherogenic cardiovascular diseases[24,26]. Some studies have been shown that serum lipids may also be associated with TSH levels in individuals with thyroid function that is considered biochemically normal[18].

This study revealed that BMI and waist circumference was greater in dyslipidemic group compared to normolipidaemic group. From this result it is very clear that the study population were overweight. The present study result is supported by Flegalet al[19] and has mentioned that over the last few years an unprecedented increase in obesity prevalence has settled worldwide, especially in industrialized countries. The reasons for this pandemic are still a matter of debate, but they are certainly related to the profound changes associated with modern lifestyle that implies a deep transformation in energy balance.

In this study, abnormal increase in TC, LDL and TG and decrease in HDL level in dyslipidemic group than norlipidemic group.Some studies reported the presence of elevated serum levels of total cholesterol (TC), low-density lipoprotein cholesterol (LDL –C) and triglycerides (TG) in individuals with hypothyroidism which is consistent with the present study[17]. Some studies have also demonstrated that TC and LDL levels are elevated in patients with subclinical hypothyroidism with comparable but less pronounced associations than in those subjects with overt hypothyroidism[20]. However, other studies did not show any effect of hypothyroidism on lipid profile[10,15]. Some studies have even shown that serum lipids may also be associated with TSH levels in individuals with thyroid function that is considered biochemically normal[18].

The median of TSH in normolipidaemic group is 2.42 whereas in dyslipidemic group is 3.64 , but the difference between these two groups is not statistically significant (P value =.0.234). The median of FT4 and FT3 in normolipidemic group is 14.14 and 3.74 and dyslipidemic group is 13.94 and 3.49 respectively. But these results are not statistically significant (P value=0.777 and 0.51). TSH is higher in dyslipidemic group than in normolipidaemic group. 20 years follow up of Wickham study observed that TSH higher than 2 mU/l was associated with increased risk of hypothyroidism[30]. The mean with standard deviation of TC, TG,LDL and HDL in norlipidemicgroup and dyslipidemic group are 166.57 ±20.60, 79.72 ±27.87,102.21±19.30 and 49.67±7.53 and 183. 64±40.89, 127.53 ± 61.62,124.80 ± 35.63 and 34.53 ± 9.50 respectively. In dyslipidemic group TSH is positively correlate with TC, TG but negatively correlate with HDL but correlation is very weak. FT3 is positively correlate with TC,TG and HDL and FT4 negatively correlate with TC,TG and HDL. In our study TSH is correlated with TG in both groups. In an Italian cohort of women an increase in free T3 and TSH levels was associated not only with BMI, but waist circumference and fat accumulation as well[31]. Reinehr et al[32] haspublished similar report and has mentioned

that this TSH profile was also observed in a sample of obese children. From the present study it has been found that the free T3 level is weakly correlated with the BMI and this is not significantly correlated. Similar result was published that serum TSH levels have been positively correlated with body mass index[33]. It is interesting that waist circumference is negatively correlated with normolipidaemic subject; on the other hand dyslipidemic group is positively correlated with the waist circumference. However, the correlation is very weak. It has been established that thyroid hormones (TH) play a key role in regulating energy homeostasis, the obesity pandemic has driven new interest in the relationship between thyroid hormone and weight status[32]. Weight loss is a typical sign of thyroid hyper function, whereas hypothyroidism is generally associated with weight gain. Thyroid hormone plays an essential role in regulating energy balance, metabolism of glucose and lipids[34]. Hypothyroidism is associated with obesity, dyslipidemia and increased risk of atherogenic cardiovascular diseases[24].Thyroid hormone status was found similar between normolipidemic and dyslipidemic group. There were no significant differences between normolipidemic and dyslipidemic group.

There was no significant correlation of TSH, FT3 and FT4 with BMI, WC, TC, TG and HDL-C and LDL-C. But obesity is great problem in our country. Obesity contributes to hypertension, dyslipidemia (High serum total cholesterol, LDL cholesterol, low HDL cholesterol) which are cardio-metabolic risk factor. This clinical awareness will help to give adequate attention to dyslipidemia, hypothyroidism and cardio-metabolic risk factors to attempt to reduce mortality and morbidity out of dyslipidemia, hypothyroidism and cardiac diseases.

CONCLUSION:

We conclude that dyslipidemia are not associated with thyroid dysfunction.There is weak correlation between dyslipidemia and thyroid dysfunction.Therefore, patients are presenting with dyslipidemia are recommended for investigation to explore thyroid disorder.

There are some limitation in this study. Some are mentioned below:

1. It was a single dentred study.
2. Sample size was not reflectiong the whole country scenario.
3. It was a purposive non-random sampling method.

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