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Informations about Prime Medical College, Rangpur

Prime Medical College is one of the best and largest private medical college in Bangladesh. It was established in 2008. The ideas of establishing this Medical College is to provide standard Medical Education and Health Services to the people at an affordable cost.

The objectives of the institute are :

- To promote and provide education in Medical Science and to Provide training in different discipline of medicine recognized by the postgraduate institutes and universities.
- To conduct research work on the diseases prevalent in the country.
- To conduct research on medical education with the aim of uplifting the quality and standard of medical education in the country.
- To produce and provide skilled manpower in the medical, nursing and paramedical fields.
- To provide quality medical care and heath services to the people at reasonable cost.

The first and foremost objective of establishment of this medical college is to offer MBBS degree under Rajshahi University of Bangladesh and to provide good quality medical graduates, who can fulfill the need of health care prevailing in the country.

Editorial

‘Cell phone’- is it time bomb for health?

Sarker PC

Cell phone also called mobile phone was introduced first on 3 April, 1973 by Martin Cooper, a senior engineer at Motorola multinational telecommunication company of America. The first handheld cellular mobile phone was weighing 2 Kg[1]. Mobile phone converts the voice into electrical signals, which then transmitted as a electromagnetic waves and converted back into sound to the other phone[2].

Electromagnetic radiation (EMR) simply called radiation means the emission of energy as particles or waves. It has a wide spectrum that ranges from low frequency radio waves to high frequency gamma waves. There are mainly two types of radiation, one is non-ionizing radiation and another is ionizing radiation. Non-ionizing radiation is a lower frequency, or longer wavelengths which are emitted from power lines, radios, cell phones and from visible lights. This type of radiation is not powerful enough to break the chemical bonds in molecules. In general, it is not harmful to human health as radiation per se, but could be harmful in terms of the transfer of heat energy[3]. Ionizing radiation is of higher frequency on the EMR spectrum than non-ionizing radiation. These frequencies range from visible light to gamma rays and X-rays. Ionizing radiation is generally considered to be more hazardous to human health than non-ionizing radiation because it can remove electrons from atoms[4]. This means that it can damage living tissue and DNA. There are four basic types of ionizing radiation: Alpha, beta, gamma and x-ray, and neutron particles. All of these types of radiation are caused by the activity of unstable atoms[3,4].

Human are exposed to radiation from natural sources every day. On average human receives about 3mSv (milli sievert) per year from naturally occurring radioactive materials and cosmic radiation from outer space[5]. The mobile phone also emitted radio waves as long as they are switched on. Human are in constant exposure to these radio waves as long as they keep the cell phone near to the body. The exposure increases many fold during talking over it[6]. According to a study conducted by Indian Thermal Analysis Society (ITAS), living in an area with cell phone towers with high frequency can cause cancer. They identified three cancer cases in the same building that present opposite to a cell phone tower. ITAS claims that the more number of cell phone companies sharing a single tower, the greater the hazards of cell phone towers[7]. The major problems found in people living near cell phone towers are: Cancers, Gliomas, Dry Eye, Muscle problems and damage to the brain[8].

The specific absorption rate (SAR) is the rate of electromagnetic energy that is absorbed by the human body while using cell phones and other devices emitting radio waves. It is measured in Watts per Kg of human tissue. If the SAR limit of cell phones is 1.6W/Kg (as in the US), the total time that a person can use cell phones is maximum 6 minutes [8,9].

Based on different case studies, the ITAS concluded that people living within 50 to 300-meter radius of cell phone towers are at higher risk of diseases due to electromagnetic radiation[6,9]. Building Biology Institute of Germany, stated that anything above 10 Micro-Watt per square meters is a matter of concern, as it will affect the biological cells in all kinds of lives – plants, animals, and humans. For towers that emit more than 10 microwatts per square centimeter, the study classifies exposure concerns as severe[9].

A study on rats show prolong exposure to electromagnetic radiation can lead to severe brain damage. People using cell phone to a particular brain side have more risk of damaging that side of brain leading to complex disorders that may or may not be reversible[10] .

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Children are at a great risk of procuring disease from excess usages of cell phone because their skull is thin compared to adults. Children using cell phone beyond limits run in to a major risk of procuring brain damage due to increased heating of brain cell and risking loss of hearing and vision[11].

The world Health organization already declared to limit the uses of mobile phone as it is possibly carcinogenic to human and also causes health hazards. Rating scale of mobile phone as carcinogen that contain 5 levels just below the smoking[12].While some countries have now made it mandatory to display the SAR value of cell phones on their handsets, others have not yet woken up to the dangers of using cell phones. This is very alarming for our children. Their usage is uncontrolled[13]. What will happen after 20 and 30 years? Only the time will tell the facts.

However all should try to follow the safety usages of mobile phone as it has become the parts and parcel of our life. During talking, keep the phone away from body, use some hand-free device such as earphone or Bluetooth. Try not to talk on the mobile phone more than 15 minutes at a time. Better to use land line phone as they use analog signals[14] and above all don't be addicted to mobile

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Original article

Effect of tobacco consumption on red cell indices in tobacco chewers of Rangpur city of Bangladesh.

Sultana MF[1], CR[2], Zahid ZR[3], Ahmed N[4].

ABSTRACT

BACKGROUND: *In Bangladesh, immediate availability and the low price of tobacco is the cause of high consumption, which leads to alteration of hematological parameters. Alterations of these parameters are associated with a greater risk for developing chronic pulmonary and cardiovascular diseases.* ***OBJECTIVES:*** *To observe the effects of tobacco consumption on red blood cell indices in tobacco chewers.* ***METHODS:*** *This cross sectional study was conducted from July 2014 to June 2015 in the Department of Physiology, Rangpur Medical College, Rangpur. A total number of 100 subjects were selected, among them 50 were apparently healthy non-tobacco chewer non-smoker subjects as control group (group A) and 50 were apparently healthy tobacco chewer non-smoker subjects as experimental group (group B)). The subjects were selected from different areas of Rangpur city. For statistical analysis independent sample "t" test was performed by computer based software SPSS-17.0 version for windows.* ***RESULTS:*** *Mean value of PCV and MCH were significantly higher ($p<0.001$) in tobacco chewers non-smoker subjects than non-tobacco chewers non smoker subjects. But the differences between mean value of MCV and MCHC were not significant ($p>0.05$) in between the groups.* ***CONCLUSION:*** *From this study it can be concluded that changes occur in RBC indices due to tobacco chewing.*

Keywords: Smokeless tobacco, Nicotine, Red cell indices.

INTRODUCTION

Tobacco products including chewing tobacco, snuff, cigarettes, cigars and loose pipe tobacco contain the dried, processed leaves of the tobacco plant "Nicotiana rustica" or "Nicotiana tabacum"[1]. There are two kinds of commonly used tobacco products in Bangladesh i.e. smoking and smokeless tobacco products. Traditionally Bangladeshi men smoke cigarettes, bidi and chew tobacco leaf as zarda, sada pata, gul, khoinee as smokeless form. However, women usually consume smokeless tobacco more than tobacco in smoked form[2]. All forms of tobacco contain nicotine, an extremely addictive substance that can act as both a central nervous system stimulant and depressant[1]. Both smoked form and smokeless are harmful for human health because they contain not only nicotine, thousands of other chemicals such as cresol, pyrene, DDT, carbon monoxide, ammonia, hydrogen cyanide, acetone, methano[1], formaldehyde, arsenic, cadmium etc are present in tobacco[2].

In Bangladesh 43.3% (41.3 million) adult people consume tobacco in smoking and or smokeless form. Among them, 26.4% of men, 27.9% of women and 27.2% (25.9 million

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adults overall) use smokeless tobacco. On the other hand, 44.7% of men, 1.5% of women and 23.0% (21.1 million adults overall) use smoked tobacco. It has been estimated that each year more than five million people die globally due to tobacco related illness, which is expected to increase to 8.3 million by 2030[3]. Tobacco consumption in any form has negative consequences on health and it has become a significant public health concern around the globe[4]. Tobacco use has both acute and chronic effect on RBC indices. Alteration of these parameters might be associated with a greater risk for developing atherosclerosis, polycythemia vera, chronic obstructive pulmonary disease and or cardiovascular diseases[5,6].

Consumption of tobacco is now increasing rapidly throughout the developing world and is one of the biggest threats to current and future world health[7]. Because of vigorous efforts toward increase awareness of adverse effects of tobacco, smoking has declined consistently over the last few years; paradoxically the use of smokeless tobacco and snuff has greatly increased[8]. Since 1990, WHO and the U.S. Centers for Disease Control and Prevention (CDC), along with their partners, have worked together to implement the Global Tobacco Surveillance System (GTSS). Bangladesh has been implementing surveys under GTSS since 2004 regularly at periodical intervals.

As a result of global awareness about the ill effects of tobacco use, the Cigarettes & other Tobacco Products Act of 2003 was passed, which states that: Prohibition of direct & indirect advertising of tobacco products; Prohibition of smoking in public places; Prohibition on sale of tobacco to persons below 18 years of age; Prohibition on sale of tobacco within a radius of 100 yards of educational institutions; Warnings on tobacco packaging carrying the ill effects of tobacco[3].

In our country three varieties of tobacco- Jati, Motihari and Virginia – are grown in different districts. Among them, Rangpur still remains highest with 40,345 acres in the year 2008-2009[9].

The purpose of this study was to asses the effect of tobacco on some hematological parameters of tobacco chewers of northern region of Bangladesh, because the rate of tobacco use is more among the people of this region. As far as our knowledge, this kind of study is not previously done in our country. This study would increase awareness about the adverse effects of tobacco on hematological parameters.

METHODS

This Cross-sectional analytical study was conducted in the Department of Physiology, Rangpur Medical College, Rangpur from July 2014 to June 2015.The Rangpur Medical college ethical committee and thesis protocol review committee approved the study protocol. Total numbers of 100 apparently healthy subjects of both sexes with age from 20-40 years were divided into following groups: Group-A (Control 50): Apparently healthy subject of non-tobacco chewers non smokers and Group-B (Experimental 50): Apparently healthy subject of tobacco chewers non-smokers. The subjects included in each group were matched in their age and socio-economic condition. The duration of chewing was more than three years. All the subjects were free from history of bleeding disorders, diabetes mellitus, hypertension or any acute infection, history of any recent medication like aspirin, steroid or non-steroidal anti- inflammatory drugs.

After selection of subjects, the objectives and the procedure of the study were explained in detail to them and their informed written consent were taken. A standard questionnaire was filled up after taking history and thorough clinical examinations. All study subjects were advised to be in overnight fasting state that is for about 8-10 hours and to attend next day at 8.00 am in the Department of Physiology, Rangpur Medical College, Rangpur. Fasting venous blood sample was collected from the subjects. 5 (Five) ml of blood was collected from ante-cubital vein of each subject under all aseptic precaution by a disposable syringe. The needle was detached from the nozzle and blood was immediately transferred into two set of test tubes with gentle push to avoid hemolysis. For

hematological analysis, blood sample was collected in a test tube containing EDTA (ethylene diamine tetra acetate,an anti-coagulant) and immediately taken to the laboratory. Then RBC indices : PCV, MCV, MCH and MCHC were studied with an automatic electronic blood count analyser at the Department of Biochemistry, Rangpur Medical College, Rangpur. For statistical analysis independent sample "t" test was performed by computer based software SPSS-17.0 version for windows. $p<0.05$ was considered as significant.

RESULTS

The data depicted in Table I shows age of the tobacco chewers and healthy control subjects.

Table-I: Distribution of mean ± SD age in different groups.

Groups	Age (Years)
A (n=50)	30.38 ± 4.31 (22 - 38)
B (n=50)	30.92± 4.31 (23 - 40)

Figures in parenthesis indicates ranges
n= no of subjects in each group
Group A= Apparently healthy subjects of non-tobacco chewer non-smoker (Control).
Group B= Apparently healthy subjects of tobacco chewers (Experimental).

The data depicted in Table II shows an alteration in the hematological parameters in tobacco chewers than those of healthy control subjects, where mean (± SD) value of PCV and MCH were significantly higher ($p<0.01$) in tobacco chewers than those of healthy control subjects and the differences regarding mean (± SD) value of MCV and MCHC were not statistically significant ($p>0.05$) between the groups.

Table II: Distribution of subjects according to mean (± SD) PCV, MCV, MCH and MCHC.

Variables	Group A (n=50)	Group B (n=50)	p value
PCV (%)	38.67 ± 2.65 (31.2– 44)	41.56 ± 2.87 (35.7 – 48.6)	0.000***
MCH (pg)	25.398 ± 1.89 (19.1 – 28.5)	26.86 ± 2.51 (21.5 - 31)	0.004**
MCV (fl)	79.168 ± 7.71 (64.4- 91.4)	79.74 ± 7.82 (65.4 – 93.6)	0.928^{NS}
MCHC (gm⁄dl)	32.826 ± 1.14 (30.9- 35.6)	33.04 ± 1.19 (30.3 – 35.4)	0.631^{NS}

Student's 't' test was done for comparison. Figures in parenthesis indicate ranges.
Group A= Apparently healthy subjects of non-tobacco chewer non-smoker (Control).
Group B= Apparently healthy subjects of tobacco chewers (Experimental).
n= Number of subjects.***= $p<0.001$, **= $p<0.01$, NS= $p>0.05$.
# Normal range of PCV in men: 47 ± 7 % and in women: 42 ± 5 %,MCV is 85 ± 9 fl, MCH is 29.5 ± 2.5 pg, MCHC is 33 ± 2 gm/dl10.

DISCUSSION

Any form of tobacco consumption has negative impact on health[4]. It has been observed that tobacco consumption leads to acute and chronic effect on RBC indices, which increases the risk for developing atherosclerosis, polycythemia vera, chronic obstructive pulmonary disease and or cardiovascular diseases[5,6].

In our study, we have observed that mean PCV and MCH value were significantly higher in tobacco chewers than those of healthy control subjects which is consistent with findings of several studies[5,11,12,13,14]. Again, in the present study non significant difference of MCV and MCHC were observed in tobacco chewers than healthy control subjects, which is also similar to the reports by others[12,13,14].

In this study, higher levels of PCV and MCH in tobacco chewer non-smoker subjects may be due to high nicotine content and tobacco specific nitroso amines i.e nitrosomethyl amino butanon, nitroso nornicotine, nitroso anabatin and nitrosoanabasine that causes chronic inflammatory changes in various cells, organs and systemic circulation leading to chronic lung disease. Consequently insufficient gaseous diffusion occurs through respiratory membrane, which produces chronic tissue hypoxia that stimulates erythropoiesis leading to increase in PCV and MCH in tobacco chewers[5,11.]

Again, numerous oxidants such as superoxide anions, hydroxyl radicals, H_2O_2 and HOCL present in tobacco that interacts with various biomolecules like DNA, RNA, lipids, amino acids, proteins, glutathione, α_1 –antiprotease causes inflammation and injury of the lungs. This also causes insufficient pulmonary function producing chronic tissue hypoxia and stimulates erythropoiesis for fulfilling the oxygen demands of the body. This leads to increase PCV value and MCH in tobacco chewers[12,13.]

Mean corpuscular volume (MCV) of red cells smaller or larger than normal size indicates the person had anemia. Increased MCV means the subjects might be suffering from megaloblastic, hemolytic, pernicious or macrocytic anaemia usually caused by vitamin B-12 or folic acid deficiency. Decreased MCV means the subjects might suffer from microcytic anaemia due to iron deficiency[12,13.] In this study, no significant effects on MCV may be due to iron, folic acid or vitamin B-12 deficiency anaemia were not developed in tobacco chewers. As the PCV concentration increased proportionately, So, non-significant increase of MCHC might occur in tobacco chewers[13,14.]

CONCLUSION

From this study it can be concluded that changes occur in RBC indices due to tobacco chewing. However, the exact cause of changes in red blood cell indices can't be elucidated from this type study. Estimation of serum nicotine level, serum iron, serum total iron binding capacity, folic acid and vitamin B-12 level in tobacco chewers with large sample size may give more conclusive findings.

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Original article

Seasonal variation of stroke patient: a retrospective study in a private Medical College and Hospital at Rangpur.

Islam MN[1] and Rizwan ASM[2]

ABSTRACT

INTRODUCTION: *Seasonal variation in stroke is not widely studied in our country although it may add valuable insight in our understanding as well as may help us to take preventive strategies.* ***OBJECTIVE:*** *To evaluate the seasonal variation of stroke patient throughout a year.* ***MATERIALS AND METHODS:*** *The current study was conducted using hospital records of one hundred and fifty one (151) CT confirmed adult stroke patients admitted in one year at Prime Medical College and Hospital from July 2014 to June 2015.* ***RESULT:*** *Majority of the stroke admission were in spring (30.40%), followed by winter (29.80%) season. Among the admitted patients in different seasons most were ischemic stroke patients(55.63%). In Spring 34.50%, in Winter 29.70%, in Autumn 19.04% and in Summer 16.60% ischemic patients were admitted. Among the haemorrhagic stroke most of the patients (30.30%) were admitted during winter season. Among the subarachnoid haemorrhage patient 36.3% were admitted during summer season. The differences among the different stroke patient in different season was not statistically significant though ($p>0.05$). Among the stroke patients male were more affected (63.58%) compared to female(36.42%). But again the difference was not statistically significant ($p>0.05$).* ***CONCLUSION:*** *From this study we can conclude that although the incidence of ischemic stroke was predominant than other types of stroke but statistically not significant and most of the people were also predominantly affected during spring and winter seasons of the year.So, we recommend broad base study to have the actual picture on this regard.*

Key words: Stroke, seasonal variation.

INTRODUCTION

Stroke is the most common clinical manifestation of cerebro-vascular disease. It is a major cause of death and disability worldwide[1]. In Bangladesh, stroke has been ranked as the third leading cause of death[2] The World Health Organization (WHO) ranks stroke mortality in Bangladesh as number 84 in the world[3]. Seasonal variation from cerebro-vascular disease has been a matter of research for a while, although the results are inconclusive[4,5,6.]

Despite extensive research on different aspects of stroke, seasonal variation of stroke has been studied scarcely in our country. We lack substantial data on this potentially crucial feature that may help us to understand and thereby combat the stroke burden of our country. Seasonal variation in stroke has been studied in many countries like Japan[7] the United States[8,9,] Canada[1] and the United Kingdom[11]. In Bangladesh there were few studies on this topic[12,13.] Considering these facts the present study was carried out to evaluate the seasonal variation of stroke incidence through Prime Medical College, Rangpur.

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MATERIALS AND METHODS

This was a retrospective study on one hundred and fifty one (151) stroke patients who were admitted and managed in the Department of Medicine of Prime Medical College Hospital during a calendar year of July, 2014 to June, 2015. Information was collected from medical record keeping section of Department of Medicine. All patients with ischemic, haemorrhagic or sub-arachnoid haemorrhage (SAH) type stroke aged more than 18 years were included in this study. Patients below 18 years, patients without Computed tomography (CT) confirmation of stroke or who had epidural or sub-dural haemorrhage were excluded from the study. For purposes of the study, the seasons were defined as winter = November to January, spring = February to April, summer = May to July, autumn = August to October. Necessary data were extracted and analyzed using IBM SPSS 20.0 software. Statistical analyses were done using the chi-square test and p value of <0.05 was set to be the level of significance.

RESULT

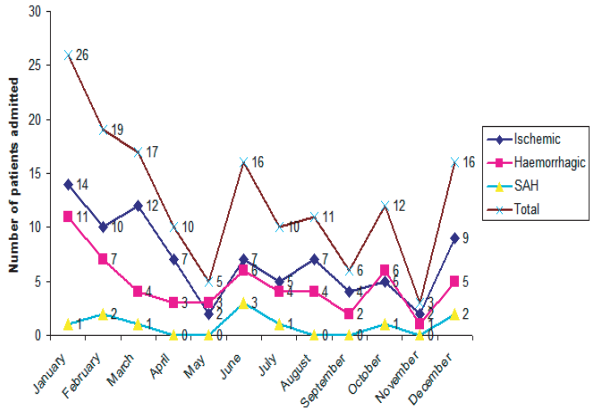
Table I shows that, there are three peaks of admission of stroke patients. Highest overall admission rate 17.21% (26) took place in January followed by February 12.58% (19) and March 11.25% (17). Lowest admission rate 2% (3) was in November.

Table I:Monthly distribution of stroke patients admission (n= 151).

Month	Ischemic stroke	Haemorrhagic stroke	SAH stroke	Total Stroke
January	14(53.8)	11(42.3)	1(3.8)	26(17.21)
February	10(52.6)	7(36.8)	2(10.5)	19(12.58)
March	12(70.5)	4(23.5)	1(5.8)	17(11.25)
April	7(70)	3(30)	0(0)	10(6.6)
May	2(40)	3(60)	0(0)	5(3.3)
June	7(43.7)	6(37.5)	3(18.7)	16(10.6)
July	5(50)	4(40)	1(10)	10(6.6)
August	7(63.6)	4(36.3)	0(0)	11(7.2)
September	4(66.6)	2(33.3)	0(0)	6(4)
October	5(41.6)	6(50)	1(8.3)	12(8)
November	2(66.6)	1(33.3)	0(0)	3(2)
December	9(56.2)	5(31.2)	2(12.5)	16(10.6)

The Figure in the parenthesis indicates percentage.
n= number of patients.

Figure 1: Monthly admission of different stroke patients (n= 151)



n= number of patients.

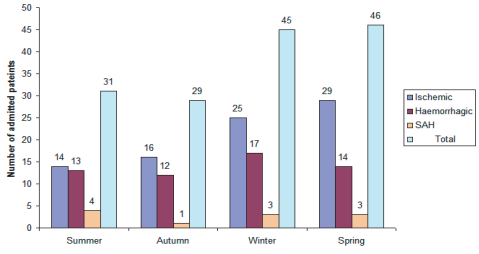
Among the stroke patients the total number of stroke admitted in Spring was 46 (30.40%), in Winter 45(29.80%), in Summer 1(20.50%)and in Autumn was 29(19.20%).Most of the atients admitted in spring, winter, autumn and summer season were ischemic stroke (34.50%, 29.70%, 19.04% and 16.60% respectively). However, the difference among the admitted stroke atient in different seasons was not statistically significant (p>0.05) (Table II).

Table II: Different types of stroke patient admission in different seasons (n=151).

Stroke type	Summer	Autumn	Winter	Spring	Total	p
Ischemic	14(16.60)*	16(19.04)	25(29.70)	29(34.50)	84(55.63%)	0.683282
Haemorrhagic	13(23.20)	12(21.20)	17(30.30)	14(25)	56(37.09%)	
SAH	4(36.30)	1(9.09)	3(27.20)	3(27.20)	11(7.28%)	
Grand Total	31(20.50)	29(19.20)	45(29.80)	46(30.40)	100(100%)	

*The Figure in the parenthesis indicates percentage.

Figure 2: Seasonal variation of stroke types (n=151).



n= number of stroke patient

Among the admitted stroke patient mean age was 60.5±15.7, 58.6±13, 62±14.3 and 56.3±15.1in winter, spring, summer and autumn respectively (Table III). During winter season patient's hospital stay were 5.8±3.8 days, in spring 5.2±3.7 days, in summer 8±4.9 days and in autumn 5.4±3.5 days (Table III).

Table III: Mean age of patients and their hospital stay in different seasons (n=151).

Season	Winter	Spring	Summer	Autumn
Mean Age (±SD) (Years)	60.5±15.7	58.6±13	62±14.3	56.3±15.1
Mean Hospital Stay(±SD) (Days)	5.8±3.8	5.2±3.7	8±4.9	5.4±3.5

n= number of stroke patient.

Among the admitted stroke patients in winter 24 (28.61%) was male and 21 (16.39%) was female, in spring 33(29.25%) was male and 13(16.75%) was female, in summer 19(19.71%) was male and 1211.29%) was female and in Autumn 20(18.44%) was male and 9(10.56%) was female. The differences among male and female stroke patient in different season were not statistically significant p<0.05) (Table IV).

Table IV: Gender variation among stroke patients in different seasons (n=151).

Season	Winter	Spring	Summer	Autumn	Total !	p
Male	24 (28.61%)	33(29.25%)	19(19.71%)	20(18.44%)	96 (63.58%)	0.284337
Female	21(16.39%)	13(16.75%)	12(11.29%)	9(10.56%)	55 (36.42%)	
Total	45(29.80%)	46(30.46%)	31(20.53%)	29(19.21%)	151(100%)	

DISCUSSION

Stroke accounts for millions of deaths worldwide. Among which 87% of deaths occur in low- and middle-income countries[14,15]. Many studies conducted in different countries throughout the world report an association of stroke incidence with different seasons[16,17,18,19,20] but there are also evidences that does not support it[21,22]. Moreover, among the studies which reported a seasonal effect on stroke, the season of peak stroke incidence varies.

The present study clearly demonstrates monthly as well as seasonal variation in the occurrence of all forms of stroke events in both genders. The highest number of ischemic and haemorrhagic stroke admission occurred in spring and winter respectively. These findings were similar to the studies done in India[23] and Japan[24,25] but contradicts with one of the Bangladeshi studies[26]. The maximum number of sub-arachnoid haemorrhage patient was admitted in summer.

Although we have found differences in stroke occurrence in different seasons, but unfortunately in our study we couldn't find any statistically significant difference. This insignificance may partly due to the small number of study population that we worked on and also due to its single centered nature which may have lacked the diversity of a large group. The reasons for the higher occurrence of strokes during the winter may partly be explained by the seasonal variation of blood pressure, with blood pressure being higher in winter[27] perhaps because of cold-induced peripheral vasoconstriction[28,29],total cholesterol and triglycerides tend to be higher in winter than in summer[29].

Male preponderance was found in all seasons except winter where male and female were almost equal in number. In general, male are affected more by stroke due to the presence of risk factor like smoking. In Rangpur, large number female especially with poor socio-economic background are smoker[30]. The reason behind this gender differences in various seasons is poorly understood in our study and again the differences were not significant. Further research is required to explore the potential link between affected gender and season.

Again, this study was a retrospective analysis, so we couldn't assess biological factors as a potential cause of seasonal variation in stroke incidence. Further studies with assessment of risk factors should be carried out to better understand the reasons for seasonal differences in the incidence of stroke.

CONCLUSION

From this study we can conclude that although the incidence of ischemic stroke is

predominant than other types of stroke but the findings was not statistically significant and most of the people were also predominantly affected during spring and winter seasons of the year. So, we recommend broad base study to have the actual picture on this regard, which may be helpful to take proper measures for stroke patient in time. Moreover, special attention should be paid to the peak-incidence periods from spring to winter.

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Original article

Study on assessment of patient satisfaction in a private Medical College Hospital

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ABSTRACT

INTRODUCTION: *Quality of health care & services is an important global issue. Health care systems are improving rapidly to meet the increasing needs & demands of patients. Hospitals must recognize the quality, demand & choice of patients. Patient satisfaction is an important indicator of quality & efficiency of health care system.* ***OBJECTIVE:*** *To assess certain domains/aspects of patient satisfaction with services and facilities in a private medical college hospital.* ***MATERIALS AND METHODS:*** *A cross-sectional survey was conducted among the admitted patients of a private medical college hospital from January to July 2015 after taking permission from ethical committee. The sample size was 384. A pre-tested, semi-structured questionnaire was used for the study.* ***RESULTS:*** *Average age of respondents was 36.84 ± 9.99. Average income 12,089 ± 6884 taka. Out of 384 respondents 67.4% were female and 32.6% male. Among the respondents 38% was illiterate , 46.4% bellow SSC and 14.8% from SSC to Degree. Regarding occupation, 16.7% had private jobs, 10.9% business, 17.2% agriculture, 50.3% had other jobs. Majority of the subjects, 93.8% subjects came from rural & 6.3% from urban area. 70.1% respondents agreed that admission procedure of the hospital is good. 63.8% of respondents agreed that wheel chair & trolley services are satisfactory. 72.9% agreed that cleanliness of ward, room are good. 73.7% respondents agreed that the hospital is providing satisfactory service. 74% respondents agreed that served food is hot & in time. 46.6% agreed that canteen price is reasonable. 91.1% agreed about adequate sign boards & 88.5% about approachable ward location. Availability of laboratory technician & investigation report was 88.3% & 87% respectively. 84.4% respondents agreed that behavior of nurses & paramedical staff was good & 94.8% agreed that support of paramedical staff was satisfactory. Regarding association of sex (male/female) with overall satisfaction about hospital services like good admission procedure, physical facilities, diagnostic services, good behavior of staff, cleanliness, overall satisfaction about hospital services, males-agreed 76%, female-agreed 80%. However, the differences was not statistically significant ($p>0.05$). Regarding the association of educational level of patients with perception towards good procedure of admission, satisfaction about physical facilities, good diagnostic service, good behavior of staff, cleanliness, overall satisfaction about hospital service agreed; illiterate agreed 80%, literate 86%, and the differences was not significantly ($p>0.05$) associated.* ***CONCLUSION:*** *In our study overall satisfaction of patients with services in this tertiary care hospital was satisfactory.*

KEY WORDS: Patient satisfaction, Hospital services, quality care.

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INTRODUCTION

High quality & efficient health care is a global issue now-a days. Health care facilities are undergoing rapid transformation to meet demands of patient population[1]. Patient satisfaction is one of the established yardsticks to measure success of services provided by hospitals[2]. Improving socio-economic status, better & easier access to medical care has led to high expectations & demands of consumers for better hospital services[3]. Monitoring of patients perception about quality care is very important to assess and improve services of health care organization[4]. A distressed patient is the consumer of hospital services and expects good hospital service, comfort, care & cure[5]. Human satisfaction is a complex concept & depends on many factors like life-style, past experience, expectation and values from both individual & society[6]. The aim of any service organization should be satisfaction of customers/patients. It is a multidimensional aspect & a vital marker for quality health care delivery & an internationally accepted factor which needs to be studied repeatedly for smooth functioning of health care system[7]. It is an important issue for health care managers. The patient does not technically assess their own health status after receiving care but assess the degree of satisfaction with the services provided.

The impact of patient satisfaction expressed by patients is overwhelming on health care system. Litigation regarding treatment protocols may be serious on health care system around the world & may create doubts in the overall results of therapy in cases where patient satisfaction is in doubt[8].

Various dimensions of patient satisfaction is identified ranging from admission & discharge services as well as medical care to interpersonal communication. Recognized criteria includes responsiveness, communication, attitude, clinical skill, comforting skill, amenities, food services etc. It is also reported that interpersonal & technical skills of health care provider are two important dimensions involved in patient's assessment of hospital care[9]. Better understanding of factors pertaining to patient satisfaction will result in implementation of custom-made programs according to the requirement of the patients[10]. There is an increased level of competition & emphasis on consumerism, patient satisfaction has now become important for monitoring health care performance & health care plans. Patient can be the best judge & accurately assess & provide suggestions for further improvement of quality of health care through rectification of faults, weakness by concerned authority[11]. Many studies have developed and applied patient satisfaction as a tool for quality improvement of health care services. But very few studies has been carried out in Bangladesh to measure patient satisfaction with hospital services. Keeping this in view, the present study was conducted to evaluate the hospital services by assessment of patient satisfaction from admitted indoor patients with services provided in a private medical college hospital outside Dhaka.

MATERIALS AND METHODS

This cross-sectional study was conducted in a private medical college hospital, outside Dhaka. The hospital has both in-patient & outpatient services to patients presenting to this hospital & from other levels of care & on self-referral. The study was carried out from January to July 2015 after taking permission from ethical committee. Sample size was calculated by using the formula, $n = Z^2pq/d^2$, where n = estimated sample size,p= prevalence of patients satisfaction about medical care = 50% = 0.50, q = 1-p = 1-0.50 = 0.50, Z = 1.96 value of Z corresponding to 95% confidence interval, d = margin of error (% of relative error) = 0.05. The estimated sample size was: n= (1.962 × 0.500.50) 0.052 = 384. All the patients who gave consent during data collection period were eligible to be included in the study. A pre-tested semi-structured questionnaire was used to collect data by face to face interview. The questionnaire has 2 parts, consisting of socio-demographic characteristics (sex, education, occupation, monthly family income) and certain domains of satisfaction. The collected data were checked, verified & then entered into the computer. The analysis was carried out with the help of SPSS. All analyzed data were presented in the form of percentages. Chi-square test was applied wherever applicable.

RESULTS

Average age of the respondents was 36.84 ± 9.99yrs. It was found that majority 56.0% of the subject had age below 30 years. The rest 27.6% and 16.4% were in age group in 31-50 years and above 50 years respectively. More than 67.4% of the subjects were female and 32.6% were male. Among them 38.0% was illiterate and 62.0% was literate. Majority 93.8% of the subjects came from rural & 6.3% came from urban area. 38% were uneducated, below SSC 46.4%, SSC to degree level 14.8%. Regarding occupation, service holder, private, businessmen and farmer were 4.9%, 16.7%, 10.9% and 17.2% respectively. The rest 50.3% had others occupation. Average income of respondents was 12,098 ± 6884 taka. It was found that 24.0% of the subject had monthly household income < 5000 taka. The rest 76.0% had monthly income ≥ 5000 taka. Majority 93.8% of the subjects came from rural and 6.3% came from urban area (Table I).

Table I: Socio-demographic characteristics of the study subjects

Variables	Number(%)
Age in years (n=384):	
Age < 30 years	215 (56)
31-50	106 (27.6)
> 50 years	63(16.4)
Sex (n=384):	
Male	125(32.6)
Female	259(67.4)
Educational status of the subjects (n=384):	
Illiterate	146(38)
< S SC	178(46.4)
SSC to Degree	57(14.8)
above degree	3(0.8)
Occupation (n=384):	
Government service	19(4.9)
Private	64(16.7)
Business	42(10.9)
Agriculture	66(17.2)
Others	193(50.3)
Income (in Taka) (n=384):	
< 5000	92(24)
5000-10000	115(29.9)
10000-20000	44(11.5)
> 20000	133(34.6)
Resident (n=384):	
Rural	360(93.8)
Urban	24(6.3)

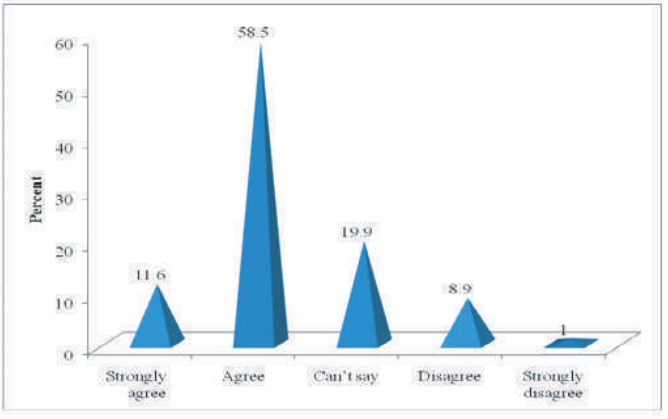
n= number of subjects

70.1% respondents agreed that admission procedure of the hospital is good. Perception of patients toward admission procedure such as good procedure of admission, helpful people at registration counter, delay for admission, good service at reception and overall good procedure of registration are presented by Table-II and Figure-1. Multiple responses of patient (PSQ-7.1 through PSQ7.5) showed that 22.0 percent, 64.5 percent, 3.2 percent, 8.9 percent and 1.3 percent were presented by strongly agree, agree, can't say, disagree and strongly disagree respectively (Table II).

Table II: Perception of patients toward admission procedure

Patient satisfaction questionnaire (PSQ 7.1 -7.5)	Number % of total	Strongly agree	Agree	Can't say	Disagree	Strongly disagree	Total
Admission procedure of the hospital is good (PSQ -7.1)	Number	109	269	3	3	0	384
	% of total	28.4	70.1	0.8	0.8	0	100.0
People atregistration counter are helpful (PSQ -7.2)	Number	83	267	12	20	2	384
	% of total	21.6	69.5	3.1	5.2	0.5	100.0
Do you mind delay for admission (PSQ-7.3)	Number	70	142	23	131	18	384
	% of total	18.2	37.0	6.0	34.1	4.7	100.0
Reception service is good (PSQ-7.4)	Number	77	278	12	13	4	384
	% of total	20.1	72.4	3.1	3.4	1.0	100.0
On the whole registration procedure is good (PSQ -7.5)	Number	84	283	12	4	1	384
	% of total	21.9	73.7	3.1	1.0	0.3	100.0
Multiple responses (%) of patient toward admission procedure (PSQ -7.1 through PSQ7.5)	Count	423	1239	62	171	25	1920
	% of total	22.0	64.5	3.2	8.9	1.3	100.0

Figure 1: Multiple responses (%) of patient toward admission procedure (PSQ-7.1 through PSQ7.5)



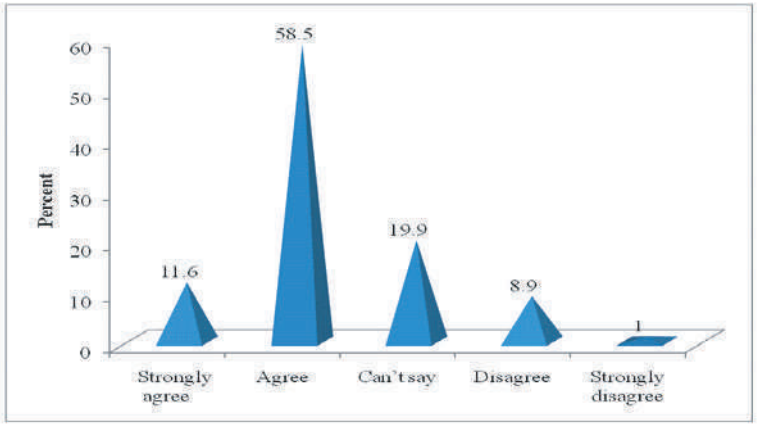
69.5% of respondents agreed that people at registration counter is helpful. Regarding perception of patients towards physical facilities, 63.8% agreed that wheel chair & trolley service are satisfactory. 72.1% agreed that cleanliness of ward, room is good & 63.3% agreed about good toilet facilities (Table III).

Table III: Perception of patients towards physical facilities

Patient satisfaction questionnaire (PSQ 8.1 -8.5)	Number % of total	Strongly agree	Agree	Can't say	Disagree	Strongly disagree	Total
Wheel chair & trolley service are satisfactory (PSQ -8.1)	Number	67	245	46	19	7	384
	% of total	17.4!	63.8	12.0	4.9	1.8	100.0
Do you find difficulty getting bed (PSQ8.2)	Number	63!	200	14	95	12	384
	% of total	16.4	52.1	3.6	24.7	3.1	100.0
Cleanliness in the ward/room is good (PSQ -8.3) !	Number	85	277	8	12	2	384
	% of total	22.1	72.1	2.1	3.1	0.5	100.0
Do you think this hospital is comfortable (PSQ -8.4)	Number	61	302	12	7	2	384
	% of total	15.9	78.6	3.1	1.8	0.5	100.0
Toilet facilities are good (PSQ-8.5)	Number	48!	243	20	70	3	384
	% of total	12.5	63.3	5.2	18.2	0.8	100.0
Multiple responses (%) of patient toward physical facilities (PSQ-8.1 through	Count	239	990	92	191	24	1536
	% of total	15.6	64.5	6.0	12.4	1.6	100.0

Perception of patients towards physical facilities such as good service of wheel chair & trolley, difficulty of getting bed, Cleanliness in the ward/room, hospital is comfortable and good facilities of toilet were presented by Table III and Figure 2. Multiple responses of patient toward physical facilities (PSQ-8.1 through PSQ-8.5) showed that 15.6 percent, 64.5 percent, 6.0 percent, 12.4 percent and 1.6 percent were presented by strongly agree, agree, can't say, disagree and strongly disagree respectively.

Figure 2: Multiple responses (%) of patient toward physical facilities (PSQ-8.1 through PSQ-8.5)



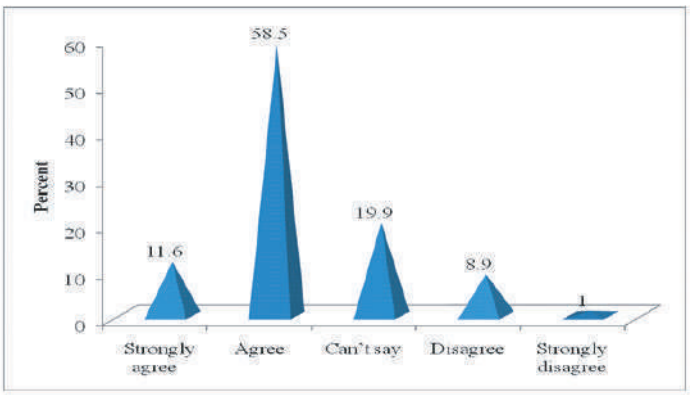
66.4% & 64.3% of respondents agreed that doctors give much attention & proper medical care & on the whole the hospital is providing satisfactory service 73.7% (Table IV).

Table IV: Perception of patients towards diagnostic service

Patient satisfaction questionnaire (PSQ 9.1 -9.5)	Number % of total	Strongly agree	Agree	Can't say	Disagree	Strongly disagree	Total
Diagnostic service are good (PSQ-9.1)	Number	69!	244	58	10	3	384
	% of total	18.0!	63.5	15.1	2.6	0.8	100.0
Doctors give much attention to the patient (PSQ -9.2)	Number	102!	255	22	4	1	384
	% of total	26.6	66.4	5.7	1.0	0.3	100.0
Do doctors give proper medical care (PSQ-9.3)	Number	104	247	28	3	2	384
	% of total	27.1	64.3	7.3	0.8	0.5	100.0
Sophisticated equipment (PSQ -9.4)	Number	59	180	126	16	3	384
	% of total	15.4	46.9	32.8	4.2	0.8	100.0
On the whole hospital is providing satisfactory service (PSQ -9.5)	Number	73	283	24	3	1	384
	% of total	19.0	73.7	6.2	0.8	0.3	100.0
Multiple responses (%) of patient toward diagnostic service (PSQ -9.1 through PSQ -9.5)	Count	407	1209	258	36	10	1920
	% of total	21.2	63.0	13.4	1.9	0.5	100.0

Perception of patients towards good diagnostic service such as good diagnostic service, attention of doctors to the patient, proper medical care by doctors, sophisticated equipment for investigation and overall satisfactory hospital service were presented by Table IV and Figure 3. Multiple responses of patient toward diagnostic service (PSQ-9.1 through PSQ-9.5 showed that 21.2 percent, 63.0 percent, 13.4 percent, 1.9 percent and 0.5 percent were presented by strongly agree, agree, can't say, disagree and strongly disagree respectively.

Figure 3: Multiple responses (%) of patient toward diagnostic service (PSQ-9.1 through PSQ-9.5)



59.4% respondents stated that doctors have given enough time to narrate the illness. 58.1% respondents agreed that attitude of doctors is satisfactory. 66.1% respondents were satisfied with behavior of nursing staff. 68.8% agreed that staff service & level of care is good (Table V).

Table V: Perception of patients towards behavior of staff

Patient satisfaction Questionnaire (PSQ 10.1 -10.6)	Number % of total	Strongly agree	Agree	Can't say	Disagree	Strongly disagree	Total
Doctors have given enough time to narrate the illness (PSQ 10.1)	Number	139	228	15	0	2	384
	% of total	36.2	59.4	3.9	0	0.5	100.0
Attitude of doctors is satisfactory (PSQ 10.2)	Number	142	223	17	0	2	384
	% of total	37.0	58.1	4.4	0	0.5	100.0
No. of rounds made by doctors is reasonable (PSQ 10.3)	Number	125	237	20	1	1	384
	% of total	32.6	61.7	5.2	0.3	0.3	100.0
Behavior of ayas, ward boy, sweepers are satisfactory (PSQ 10.4)	Number	73	221	33	56	1	384
	% of total	19.0	57.6	8.6	14.6	0.3	100.0
Behavior of nursing staff is satisfactory (PSQ 10.5)	Number	90	254	26	12	2	384
	% of total	23.4	66.1	6.8	3.1	0.5	100.0
Staff service & level of care is good (PSQ 10.6)	Count	78	264	26	12	4	384
	% of total	20.3	68.8	6.8	3.1	1.0	100.0
Multiple responses (%) of patient toward behavior of staff (PSQ-10.1 through PSQ-10.6)	Count	647	1427	137	81	12	2304
	% of total	28.1	61.9	5.9	3.5	0.5	100.0

Perception of patients towards behavior of staffs such as doctors gave enough time to narrate the illness, satisfactory attitude of doctors & reasonable number of rounds made by doctors, satisfactory behavior of ayas, word boys, sweepers and nurses and good staff service & level of care were presented in Table V and Figure 4. Multiple responses of patients toward behavior of staff (PSQ-10.1 through PSQ-10.6) showed that 28.1 percent, 61.9 percent, 5.9 percent, 3.5 percent and 0.5 percent were presented by strongly agree, agree, can't say, disagree and strongly disagree respectively.

Figure 4: Multiple responses (%) of patient toward behavior of staff (PSQ-10.1 through PSQ-10.6)

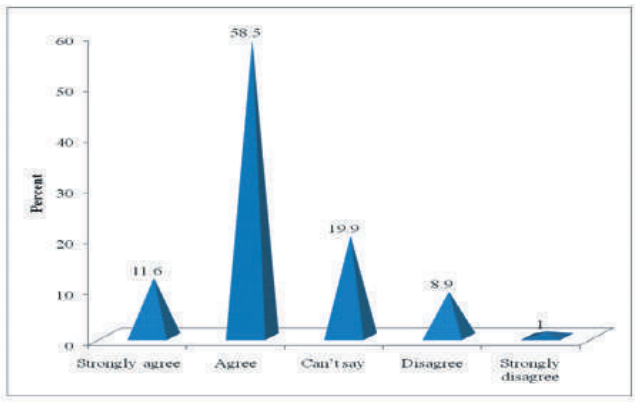


Table VI: Perception of patients towards cleanliness

Patient satisfaction questionnaire (PSQ 11.1-11.5)	Number % of total	Strongly agree	Agree	Can't say	Disagree	Strongly disagree	Total
Linen is clean in the hospital (PSQ-11.1)	Number	94	265	13	12	0	384
	% of total	24.5	69.0	3.4	3.1	0	100.0
Cleanliness in the room/ward is good (PSQ -11.2)	Number	83	280	13	8	0	384
	% of total	21.6	72.9	3.4	2.1	0	100.0
Toilets are properly cleaned (PSQ-11.3)	Number	58	217	34	74	1	384
	% of total	15.1	56.5	8.9	19.3	0.3	100.0
Sweepers are adequate in number in hospital (PSQ-11.4)	Number	64	209	57	52	2	384
	% of total	16.7	54.4	14.8	13.5	0.5	100.0
Sweepers properly clean the hospital (PSQ -11.5)	Number	54	230	46	50	4	384
	% of total	14.1	59.9	12.0	13.0	1.0	100.0
Multiple responses (%) of patient toward cleanliness (PSQ-11.1 through PSQ- 11.5)	Count	353	1201	163	196	7	1920
	% of total	18.4	62.6	8.5	10.2	0.4	100.0

Perception of patients towards cleanliness such as cleanliness of linen, cleanliness in the room/ward, toilets, adequate number of sweepers in hospital and proper cleaning of the hospital were presented by Table VI and Figure 5. Multiple responses of patient toward cleanliness (PSQ-11.1 through PSQ- 11.5) showed that 18.4 percent, 62.6 percent, 8.5 percent, 10.2 percent and 0.4 percent were presented by strongly agree, agree, can't say, disagree and strongly disagree respectively.

Figure 5: Multiple responses (%) of patient toward cleanliness (PSQ-11.1 through PSQ- 11.5)

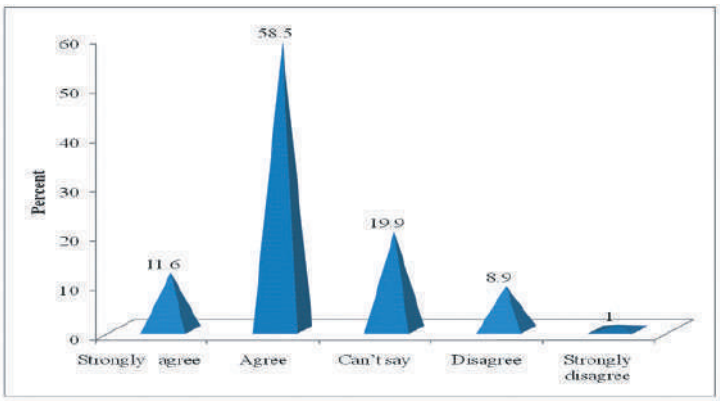


Table VII: Perception of patients towards cleanliness of foods and others

Patient satisfaction questionnaire (PSQ 12.1 -12.7)	Number % of total	Strongly agree	Agree	Can't say	Disagree	Strongly disagree	Total
Served food is tasty and hygienic (PSQ-12.1)	Number	61	274	23	19	7	384
	% of total	15.9	71.4	6.0	4.9	1.8	100.0
Served food is hot and in time (PSQ-12.2)!	Number	67	284	19	11	3	384
	% of total	17.4	74.0	4.9	2.9	0.8	100.0
Food served as per suggestion of doctor (PSQ-12.3)	Number	51	252	60	20	1	384
	% of total	13.3	65.6	15.6	5.2	0.3	100.0
Are you satisfied with the canteen menu (PSQ 12.4)	Number	39	197	106	37	5	384
	% of total	10.2	51.3	27.6	9.6	1.3	100.0
Canteen price are reasonable (PSQ-12.5)	Number	31	179	125	45	4	384
	% of total	8.1	46.6	32.6	11.7	1.0	100.0
Plates and glasses are properly washed (PSQ-12.6)	Count!	29	228	83!	40	4	384
	% of total	7.6	59.4	21.6	10.4	1.0	100.0
Are you satisfied with the seating arrangement in canteen	Number	wq	159	120	66	4	383
	% of total	8.9	41.5	31.3	17.2	1.0	100.0
Multiple responses (%) of patient toward cleanliness of foods (PSQ-12.1 through PSQ- 12.7)	Number	312	1573	536	238	28	2687
	% of total	11.6	58.5	19.9	8.9	1.0	100.0

Perception of patients towards cleanliness of foods and others such as tasty and hygienic, Served food is hot and timely, served food as per suggestion of doctor, satisfaction with the canteen menu, reasonable price of canteen foods, plate and glass are properly washed and satisfied with the seating arrangement in canteen were presented by Table VII and Figure 6. Multiple responses of patient toward cleanliness of foods (PSQ-12.1 through PSQ-12.7) showed that 11.6 percent, 58.5 percent, 19.9 percent, 8.9 percent and 1.0 percent were presented by strong agree, agree, can't say, disagree and strongly disagree respectively.

Figure 6: Multiple responses (%) of patient toward cleanliness of foods (PSQ-12.1 through PSQ- 12.7)

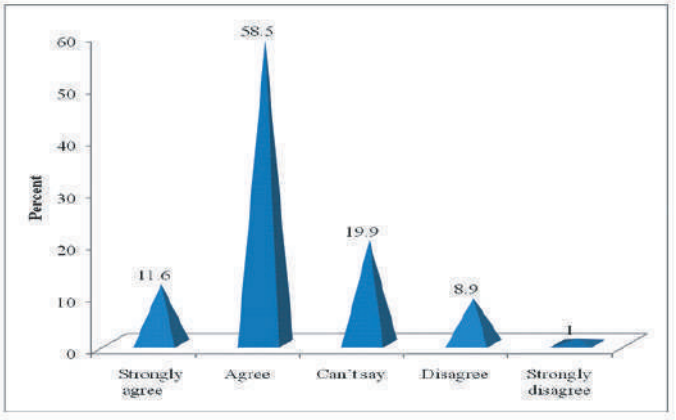


Table VIII: Perception of patients towards mode of admission .

Variables	Number(%)
Ward attendant / support staff for admission at emergency : yes No No respond	 191(49.7) 178(46.4) 15(3.9)
Ward location: Approachable Difficult to approach	 340(88.5) 44(11.5)
Sign Board: Adequate and helpful Inadequate	 350(91.1) 34(8.9)
Time taken between admission and initiation of treatment: Time given by doctors of the time of admission Immediate < 10 min. 10 min.-30 min.	 322(83.9) 53(13.8) 9(2.3)

Variables	Number(%)
Ward attendant / support staff for admission at emergency : yes No No respond	 191(49.7) 178(46.4) 15(3.9)
Ward location: Approachable Difficult to approach	 340(88.5) 44(11.5)
Sign Board: Adequate and helpful Inadequate	 350(91.1) 34(8.9)
Time taken between admission and initiation of treatment: Time given by doctors of the time of admission Immediate < 10 min. 10 min.-30 min.	 322(83.9) 53(13.8) 9(2.3)
General communication of doctor: Good Satisfactory Unsatisfactory	 313(81.5) 42(10.9) 29(7.6)
Perception of efficiency of doctors in handling illness of patients: Satisfactory Unsatisfactory	 357(93.0) 27(7.0)
Doctors discussed about investigations with patient: Satisfactory Unsatisfactory	 365(95.1) 19(4.9)
No. of visits of doctors / consultant: Satisfactory Unsatisfactory	 364(94.8) 20(5.2)
Waiting area is comfortable: Satisfactory Unsatisfactory	 342(89.1) 42(10.9)

Table IX: Perception of quality of laboratory service.

Variables	Number(%)
vailability of lab. technicians: Yes No	 339(88.3) 45(11.7)
Approach / behaviour of lab. technician: Yes No	 341(88.8) 43(11.2)
Availability of investigation report: Available on schedule time Delayed	 334(87.0) 50(13.0)

Table X: Perception regarding quality of service by nursing and paramedical staff

Variables	Number(%)
No. / availability of nursing staff in ward: Adequate Inadequate	 191(49.7) 178(46.4) 15(3.9)
Communication / behavior of nurse and para medical staff: Good Pleasant Satisfactory harsh / rough Avoiding	 324(84.4) 28(7.3) 30(7.8) 1(0.3) 1(0.3)
Dispensary provides prescribed medicine timely: Yes No Has to be asked	 332(86.5) 27(7.0) 25(6.5)
Approach of paramedical staff to ward patient: Satisfactory Not satisfactory	 359(93.5) 25(6.5)
Service and support of paramedical staff: Satisfactory Not satisfactory	 364(94.8) 20(5.2)

Among the respondants 69% agreed that linen was clean & 72.9% stated that cleanliness in room, ward were good (Table VI).

71.4% & 74% respondents said that served food was tasty, hygienic, hot & served timely. Satisfaction with canteen menu & price was 51. 3% & price 46.6% (TableVII).

About perception toward mode of admission, available support staff for admission at emergency was 49.7%. 88.5% agreed about approachable ward location, 91% agreed about adequate & helpful sign boards. General communication of doctors was good in 81.5%. 95.1% respondents were satisfied with doctor's discussion about investigation. 89.1% were satisfied with comfortable waiting area. Timely availability of investigation report was 87%. About perception regarding quality of service by nursing and paramedical staff, availability of nursing staff in wards was 84.6%. Behaviour of nursing & paramedical staff was good in 84.4%, service & support of paramedical staff was satisfactory in 94. 8% (Table VIII, IX and X).

Table XI: Association of sex with perception toward good procedure of admission, satisfaction about physical facilities, good diagnostic service, good behavior of staff, cleanliness overall satisfaction about hospital service.

Sex	Perception	
	Agree (percent of multiple responses)	**Disagree (percent of multiple responses)**
Male	76	24
Female	80	20

Chi-square = 0.26
p = 0.608
not significant at 5 percent level.

Based on Chi-square test (Chi-square = 0.26, p = 0.608) it was found that sex was not significantly associated with the perception toward good procedure of admission, satisfaction about physical facilities, good diagnostic service, good behavior of staff, cleanliness overall satisfaction about hospital service.

Table XII: Association of educational level with perception towards good procedure of admission, satisfaction about physical facilities, good diagnostic service, good behavior of staff, cleanliness overall satisfaction about hospital. service

Education	Perception	
	Agree (percent of multiple responses)	Disagree (percent of multiple responses
Illiterate	80	20
Literate	86	14

Chi-square = 0.89 p = 0.346 not significant at 5 percent level.

Based on Chi-square test (Chi-square = 0.89, p = 0.346) it was found that educational level was not significantly associated with the perception toward good procedure of admission, satisfaction about physical facilities, good diagnostic service, good behavior of staff, cleanliness overall satisfaction about hospital service.

DISCUSSION

In our study overall satisfaction of patients with services in this tertiary care hospital was 73.7% which is higher than that reported by Talukder et al in Bangladesh, which was 60%[12] and those reported by Mahapatra et al[13] in Andhra Pradesh which is 63% & Qureshi et al[14] in Kashmir 72%, but lower than that reported by SA Deva et al[15] in Kashmir 80%, Kumari et al[16] in Lukhnow 80.6%, Bhattacharya et a[l4] 88%, SK Jawhar et al[17] 90-95%.

In our study 72.1% respondents were satisfied with cleanliness, of ward, room which is lower than a study by Nethi Suresh Babu et al which is 86.67%[18], but higher than a study done in Peshawar which was 13% & 20.95%[19]. In our study 63.3% respondents were satisfied with toilet facilities than a study by Sreelata & Peerasak et al[20,] which reported a high level of dissatisfaction. In our study 74% respondents were satisfied with canteen food, where as in a study by Aleena et al 18%[21] were dissatisfied. In our study 84.4% of respondent reported that behaviour & paramedical staff was good Availability of nursing staff was 84.6%. Services & support of paramedical staff was 94.8%.

CONCLUSION

Assessment of patient satisfaction is simple and effective way to evaluate hospital service. In our study overall satisfaction of patients with services in this tertiary care hospital was satisfactory. However, cleanliness of ward & toilets needs to improve. Wheelchair & Trolley services and availability of support staff should be better. Attitude & communication of physicians & nurses is very important to allay anxiety and misconception & help to develop confidence in the health system. Satisfaction surveys will have an impact on hospital quality improvement.

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Original article

Study on serum Thyroid Stimulating Hormone level in menopausal women.

Pervin M[1], Sarkar CR[2], Ahmed N[3], Zahid ZR[4].

ABSTRACT

INTRODUCTION: *Hormonal imbalance is particularly common in a women life during menopause, where women suffer from estrogen dominance. It has also been observed that the prevalence of subclinical hypothyroidism is 4% to 10% in general population, which increases with age. Hypothyroidism is also higher in menopausal women. So, there may be relationship between estrogen dominance and hypothyroidism.* ***OBJECTIVE:*** *To observe serum thyroid stimulating hormone level in menopausal women.* ***METHODS:*** *This cross sectional study was conducted from Jan 2014 - Jan 2015 in the Department of Physiology, Rangpur Medical College, Rangpur. For this 54 menopausal women were studied and they were compared with 52 apparently healthy reproductive age women. The serum thyroid stimulating hormone level was measured in each subject. For statistical analysis independent sample "t" test was performed by computer based software SPSS- 17.0 version for windows.* ***RESULTS:*** *Mean serum thyroid stimulating hormone level was significantly higher ($p<0.001$) in menopausal women than those of control subjects.* ***CONCLUSION:*** *From this study it may be concluded that serum thyroid stimulating hormone level increases in menopausal women, which indicates hypothyroidism in this group of people.*

KEY WORDS: TSH, Menopause, Hypothyroidism.

INTRODUCTION

The word menopause comes from the Greek words "mens" for month and "pausis" for cessation[1]. Menopause is defined as the permanent cessation of menstruation. By convention the diagnosis of menopause is not made until the individual has had 12 consequtive months of amenorrhoea. During menopause cessation of menstruation as well as "Depletion of Ovarian follicle" occurs, which leads to decrease in ovarian hormones level. Natural menopause occurs at or after 40 years of age[2]. In the Western world, the most typical age range for menopause (last period from natural causes) is between 40 to 61 and the average age for last period is 51 years. The average age of natural menopause in Australia is 51.7 years. In India and the Philippines, the median age of natural menopause is considerably earlier, at 44 years[3] .

Hormonal changes begin about 5 years before the actual menopause, as the response of the ovary to gonadotropins begin to decrease and menstrual cycles become increasingly irregular[4].

In reproductive- age women, the granulosa cell of the ovulatory follicle is the major source of inhibin and estradiol. In the absence of these factors that inhibit gonadotropin secretion, both follicle stimulating hormone (FSH) and luteinizing hormone (LH) levels increase sharply in menopause. These levels remain high few years after menopause and decreases gradually[5].

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During menopause ovarian theca cells produce androstenedione and testosterone hormone under the influence of increased levels of LH. Again, adipocytes produce oestrone and oestradiol from testosterone by aromatisation that becomes main dominant hormone at this age[2]. In menopause estrogen dominance occurs when estrogen level remains high along with normal level of progesterone or low level of progesterone. Again, normal level of estrogen along with low level of progesterone can be said as estrogen dominance. Estrogen dominance causes thyroid imbalances where estrogen may affect the conversion of T4 into T3 and resulting low T3 level. It can also block the uptake of iodine by thyroid follicle during thyroid hormones synthesis. Again, estrogen dominance increases thyroid binding globulin level in blood, which usually carries thyroid hormones to the cells. Free thyroid hormone levels becomes low due to increased thyroid binding globulin[6]. All these factors leads to hypothyroidism. Some Researchers reported that when estrogen is not properly counterbalanced with progesterone, it can block the action of the thyroid hormones. So the thyroid hormones become ineffective and hypothyroidism occur[7]. The prevalence of subclinical hypothyroidism is 4% to 10% in general population, which increases with age as well as menopause[8]. Roterdam study found that subclinical hypothyroidism is in an independent risk factor for atherosclerosis, myocardial infarction, osteoporosis and some cancers increases in postmenopausal women. Many of these symptoms in menopause are similar to symptoms of hypothyroidism. It has also been observed that menopausal symptoms are more intense in patients with hypothyroidism. If hypothyroidism remains undetected and untreated, it can lead to serious health hazard[9]. In this perspective we have observed serum thyroid stimulating hormone level in menopausal women. To the best of our knowledge this type of work has not been carried out previously in our country. So, this study will be helpful to assess the thyroid functions status and adapt appropriate measure to prevent thyroid disorder in menopausal women.

MATERIALS AND METHODS

This cross-sectional study was carried out in the Department of Physiolgy, Rangpur Medical College, Rangpur, from January 2014 to January 2015. A total number of 106 apparently healthy women subjects were included in this study. Among them 54 apparently healthy menopausal women aged 40-55 years were selected as study group (Group B) and 52 apparently healthy women of reproductive aged 20-35 years were selected as control group (Group A). All the experimental subjects were selected from surrounding community. Study subjects were selected who had at least 12 consecutive months of amenorrhoea from last menstrual period. Induced menopause by chemotherapy, pelvic radiation, bilateral oophorectomy, hystectomy, menopausal women below 40 years and above 55 years, reproductive aged women below 20 years and above 35 years and subjects suffering from chronic disease like liver disease, diabetes mellitus, pregnancy and kidney disease were excluded from the study. Study protocol was approved by ethical committee of Rangpur Medical College, Rangpur. After selection of the subjects objectives and benefits of this study were explained to each subject and an informed written consent was taken. Standard questionnaire were filled up after taking history and thorough clinical examinations. 5 cc bood was collected from each subject to estimate thyroid stimulating hormone by ELISA method and also to estimate fasting blood sugar, serum creatinine level and serum ALT level by Analyzer machine in the Department of Biochemistry, Rangpur Medical College, Rangpur to exclude diabetes mellitus, liver diseases or renal impairements. All data were recorded systematically in a preformed history sheet and all statistical analysis were done by computer using the software SPSS 17.0 version for windows. Comparison of serum thyroid stimulating hormone level in reproductive age women and menopausal women were done by unpaired students 't' test. p value < 0.05 was accepted as level of significance.

RESULTS:

In this study mean age ±SD were 49.32 ± 2.02 and 25.84 ± 3.29 in Group B and group A respectively (Table I).

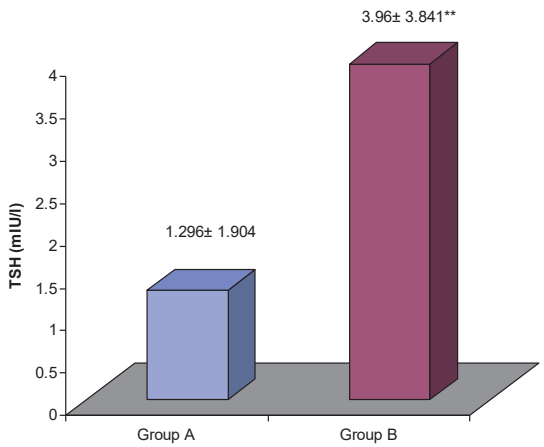
Tablel: Distribution of subjects according to age.

Groups	Age (yrs)
Group A (n=52)	(25.84 ± 3.29) (20 to 35)
Group B (n=54)	(49.32 ± 2.02) (40 to 55)

n= number of subjects
Group A = Control; Group B = ExperimentalFigures in perenthesis indicates ranges

The mean ±SD serum thyroid stimulating hormone levels were 3.960 ± 3.841 mIU/L in group B (experimental) and 1.296 ± 1.904 mIU/L in group A (control). The mean value of serum thyroid stimulating hormone level was significantly higher (p<0.001) in experimental group than that of control group(Fig. l).

Fig 1: Serum thyroid stimulating hormone levels in different groups (n=106).



n= total number of subjects
Group A = Control; Group B = Experimental
** = p<0.001

DISCUSSION

In our study we have observed the serum thyroid stimulating hormone level in menopausal women and also compared this value with apparently healthy reproductive aged women.

In this study the mean serum thyroid stimulating hormone level was significantly higher (p<0.001) in menopausal women than those of reproductive age group. This finding is in agreement with those reported in some studies.[10-16.]

The higher level of serum TSH in this group of women may be due to hormonal imbalance in a women life during perimenopause and menopause. Where "Oestrogen dominance" happens and there was not enough progesterone produced in the cycle to balance the effect of estrogen. This pattern was often experienced by perimenopausal and postmenopausal women with subclinical hypothyroidism (SCH) or T3 deficiency. Again increased thyroxine binding globulin and a decrease serum free T3 and T4 levels in menopausal women due to oestrogen dominance had been observed[10,11]. In addition, elevated thyroxine-binding globulin (TBG) increases binding of thyroxine leads to decreased level of free thyroxine resulting an increased in TSH (Thyroid stimulating hormone) secretion by negative feedback mechanism. Again, iodine deficiency in menopausal women can be the cause of higher TSH level in this group of women.[12]. Moreover, until today the major cause of hypothyroidism in elderly women is autoimmune disease due to high titre of antithyroid antibodies, where in 60.0% of elderly women had high TSH level[13].

Again, decreased prevalence of 5-alpha metabolites of androgens, a decrease in the 2-hydroxylation of oestrone and increase in peripheral aromatization of androstenedione to oestrone and oestradiol thus altered hormone status could potentially contribute to variations in thyroid hormone levels. As a result oestrogen dominance decrease thyroid hormone concentrations which leads to

increase TSH concentrations by negative feedback mechanism[14].

Moreover, in a study it was also observed that free T3 level decreases mildly in menopausal women, resulting in higher serum TSH level and TSH turnover rates may decrease with age in menopause[15].

In addition to those changes in menopausal women there is gradual decrease in the body functions affecting all systems in elderly people. These changes might be due to alter hormone production, metabolism, biological activities of target tissue response to hormones and rhythms in the body. At the time brain has diminished homeostatic reserve and is vulnerable to disturbances in the internal milieu. This occur due to alteration in the hypothalamo-pituitary- thyroid axis[16].

From the above discussion, it may be concluded that hormonal imbalance of estrogen and progesterone in a state of "Oestrogen dominance", increased in peripheral aromatization of androstenedione to oestrone and oestradiol, increased thyroxine binding globulin, increased antithyroid antibody, alteration in the hypothalamo-pituitary- thyroid axis etc. May be the contributory factor for increased TSH level in women.

CONCLUSION

It can be concluded that the serum thyroid stimulating hormone level increases in menopausal women. However, the exact mechanism can not be elucidated from this type of study. Estimation of serum TSH level along with ovarian hormones and serum thyroird binding globulins levels in menopausal can

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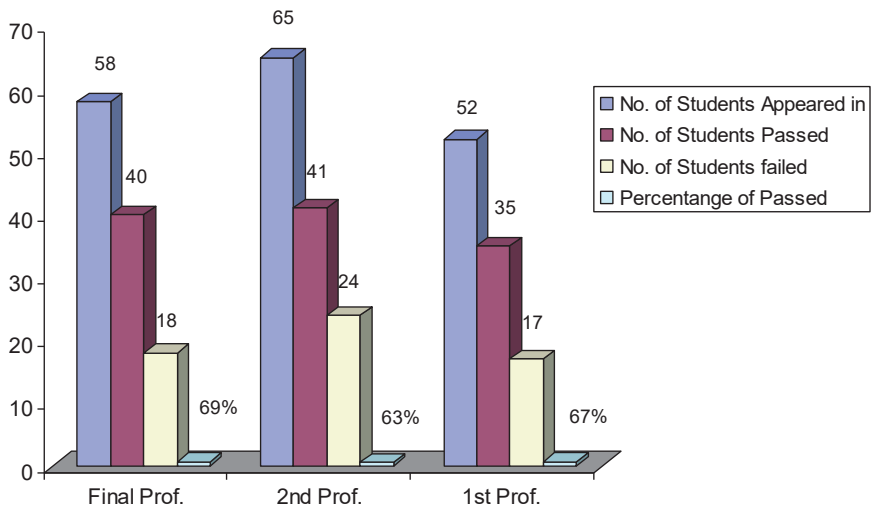
RESULTS OF PROFESSIONAL EXAMINATIONS

1st, 2nd and Final Professional MBBS Examination were held in January, 2015. The number of students appeared in; total number of students passed, total failed and percentages of pass in the 1st, 2nd and Final Professional MBBS examinations are shown in the following table and figure (Table I & Figure 1).

Table I: Result of 1st, 2nd and Final Professional MBBS Examinations in January, 2015.

Exam Year	Exam Name	No. of Students Appeared in	No. of Students Passed	No. of Students failed	Percentage of Passed
January 2015	Final Prof.	58	40	18	69%
	2nd Prof.	65	41	24	63%
	1st Prof.	52	35	17	67%

Figure 1: Result of 1st, 2nd and Final Professional MBBS Examinations in January 2015.



Forwarding letter for submission of article Prime Medical Journal

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Prime Medical College, Rangpur.

Sub : Submission of manuscript

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I/We are submitting our manuscript titled .....in your journal. This article has not been published or submitted for publication elsewhere. There is no Conflict of interest between the authors by.....1.....2
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- Selection of the reviewed and accepted manuscripts intended for publication on a paricular issue will be decided by Editorial Board.
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Alam M. heart Tate Variability in Adolescent Athletes [M Phil thesis]. [Dhaka (Bangladesh)]. Bangabandhu Sheikh Mujib Medical University; 2008 July. Appendix (name of the part 4 (number of the part), Classification of physical Activity Intensity (Tit of the Part). p.7 (Location of the Part).

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jacobs JL, Lee MT, Lindberg M, kamin C. Problem based learning, multimedia paucity of behavioral issue learninig Med Educ. Online [Interner]. 2005[cited2005]: [5p]. Available from:http:www.med-ed-online.org/pdf/10000006.pdf.