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Editorial

Monkey pox outbreak!

Prof. Dr. Parimal Chandra Sarker

The whole world facing an ongoing global pandemicity by an agent "Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2)" had caused more than 577 million cases and 6.4 million confirmed deaths, making it one of the deadliest in history.[1] During this situations a new outbreak of monkey pox, a viral disease was confirmed as first case in the United Kingdom on 6 May 2022 in an individual with travel links to Nigeria (where the disease is endemic).[2] This outbreak first time has spread widely from Central and West Africa to an increasing number of countries and regions, predominantly in Europe, North and South America, in Asia, in Africa, and in Oceania from 18 May 2022.[3,4]

"Monkey pox" is a zoonotic viral infection caused by one kind of pox virus under the family of Pox viridae. There are 22 genera and currently 83 species in this family. Among them four genera of poxviruses may infect human are Orthopoxvirus, Parapoxvirus, Yatapoxvirus, Molluscipoxvirus.[5] In the genera of Orthopoxvirus contain smallpox virus (variola), vaccinia virus, cowpox virus, monkeypox virus. Diseases associated with this genus (Orthopox virus) include smallpox, cowpox, horse pox, camel pox, and monkey pox. The important member of the genus is Variola virus, which causes disease "smallpox" but this disease was eradicated globally by 1977, through the use of Vaccinia virus as a vaccine.[5] The very recently described the Monkey pox virus which is a double-stranded DNA viruses was first discovered in 1958 when two outbreaks of a pox-like disease occurred in colonies of monkeys kept for research and hence the name 'monkeypox.[5,6] But their (Monkey pox virus) association with an illness as a disease in humans in the in 1970.[6] Since the 1980s it was thought to be uncommon in human but cases increased possibly as a result of waning immunity when there were stopping of routine smallpox vaccination.[7] Between 1981 and 1986 WHO surveillance in Democratic Republic of Congo/Zaire (DRC/Zaire) recorded 338 confirmed cases and 33 deaths, the Case Fatality Rate was (CFR) 9.8%.[8] In 1996-1997, a second outbreak of human illness was identified in DRC/Zaire and between 1991 and 1999 there were 511 cases reported in DRC/Zaire.[9,10]

Human can be infected by a bite or scratch or by contact with body fluids or lesion material of an infected animal. The virus is thought to enter through broken skin, the respiratory tract, or the mucous membranes of the eyes, nose, or mouth[11]. Once human is infected, transmission to other humans is common, with family members and hospital staffs. The virus can spread by sexual contact and during pregnancy from mother to fetus.[12] The virus can spread through indirect contact with lesion material, such as through contaminated bedding, even with standard personal protective equipment,

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likely through inhalation.[11,12] Risk factors for transmission include sharing a bed or room, or using the same utensils as an infected person.It is not yet known if people without symptoms of monkeypox can spread the virus.[12]

Sign and symptoms tend to begin 5 to 21 days after infection. Early symptoms include headache, muscle pains, fever and fatigue, resembling influenza.Within a few days of the fever, characteristic lesions appear on the face before appearing elsewhere such as palms and soles in a centrifugal distribution.[13] The disease can resemble chickenpox, measles and smallpox but is distinguished by the presence of swollen glands which may appear behind the ear, below the jaw, in the neck or in the groin, before the onset of the rash.[14] Many cases in the 2022 monkeypox outbreak presented with genital and peri-anal lesions, fever, swollen lymph nodes, and pain when swallowing, with some patients manifesting only single sores from the disease.[13,14] Three-quarters of affected people have lesions on the palms and soles, more than two-thirds in the mouth, a third on the genitals and one in five have lesions in the eyes. They begin as small flat spots, before becoming small bumps which then fill with at first clear fluid and then yellow fluid, which subsequently burst and scab over. There may be a few lesions or several thousand, sometimes merging to produce large lesions. In each affected part of the body, the lesions evolve in the same stage. It looks identical to the rash of smallpox. The rash typically lasts around ten days. An unwell person may remain so for two to four weeks. After healing, the lesions may leave pale marks before becoming dark scars. There may be complications include secondary infections, pneumonia, sepsis, encephalitis, and loss of vision with severe eye infection. Infection during pregnancy may causes stillbirth or birth defects.[13]

Despite the fact there is no specific treatment for monkey pox. Health experts around the world claim the "small pox vaccine" is 85 percent effective in preventing the disease.[15] But there is no small pox vaccine in Bangladesh and Small pox is no longer threat in Bangladesh. As a result, there is no available vaccine elsewhere like Bangladesh also.[16] As monkeypox virus enters the body through nose try to protect oneself from virus by wearing mask and wash hand frequently as rules apply in Corona virus prevention. At ports any one showing signs of monkey pox should be quarantined for at least 14 days. The CDC recommends that healthcare providers should have full set of personal protective equipment (PPE) before caring for an infected person. This includes a gown, mask, goggles, and a disposable filtering respirator (such as an N95). An infected person should be isolated in preferably a negative air pressure room or at least a private exam room to keep others from possible contact.[16]

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Original Article

Per-operative Difficulties and Early Post-operative Complications of Early Laparoscopic Intervention in Acute Cholecystitis

M. H. Mahmud[1], Bimal Chandra Roy[2], Md. Mushfiqur Rahman[3], Md. Hamidul Islam[4], Md. Amzad Hossain[5]

ABSTRACT

BACKGROUND: *Laparoscopic cholecystectomy, initially considered a contraindication for the treatment of acute gallbladder disease. In the course of time it is now being practiced for treating acute cholecystitis worldwide.* ***OBJECTIVES:*** *The aim of the study to identify per-operative difficulties and early post-operative complications of early laparoscopic intervention in acute cholecystitis.* ***MATERIALS AND METHODS:*** *This descriptive type of observational study was conducted in the Department of Surgery Rangpur Medical College Hospital, Rangpur from January, 2017 to December, 2017. Patients admitted in the hospital through emergency and outpatient department with upper abdominal pain was diagnosed as acute cholecystitison the basis of clinical history, examination, laboratory data and ultrasonographic findings. During the course of management laparoscopic cholecystectomy was performed. Observations were made of various per-operative findings and encountered difficulties and their solutions. Post-operatively patients were mentioned for complications and duration of hospital stay and return to their daily routine. All the information was recorded in a fixed protocol. Collected data was classified, edited, coded and entered into the computer for statistical analysis.* ***RESULTS:*** *All 50 patients were between the 14 to 80 years of age. The mean age of the respondents was 40 ± 16.34 years. Female ranked the highest (72%) followed by male (28%). The male to female ratio was 1:2.57. All 50 patients had right upper quadrant pain, 76% each had right upper quadrant tenderness and nausea, 94% patients suffered from fever. Clinicians could elicit Murphy's sign among 70% patients. Among 50 patients 50% experienced symptoms for 37-48 hours which was followed by 25-36 hours (22%). The mean duration of symptoms was 37.89±1.9 hours (range: 12-96hour).Distended thick walled gall bladders in 86% cases were the highest cause of per-operative difficulty followed by denseomental and other surrounding structures like colon, stomach duodenal adhesion (80%). Calot's anatomy was obscured in 03 (6%) cases, 4 (8%) cases got perforation of gall bladder with spillage of stone and 3 and 2 (4%) patient suffered from superficial surgical site infection (SSI).* ***CONCLUSION:*** *Laparoscopic cholecystectomy is the procedure of choice for management of symptomatic gallstone disease which could at times is an easy procedure conducted in a short time whereas occasionally, it can be a difficult procedure extending to a longer duration of time. Per-operative difficulties especially dense adhesion, thick walled gall bladder, gangrenous gall bladder findings in laparoscopic cholecystectomy are the utmost culprits that may ensue different post-operative complications. Among the post -*

Key word: Thyroid function, Metabolic syndrome, Young female.

INTRODUCTION

Gall stone disease is known since long ago as far as the 5th century.[1] Cholecystectomy was considered as the surgical procedure for cholelithiasis in 1882[2]. Over 95% of gall bladder disease is attributed to stone formation (cholelithiasis).[3] Dubious described cholecystectomy through a small incision.[4] It has the advantage of decreased pain, early post-operative recovery and better cosmetic results.[5] However, a restricted access makes mini lap-cholecystectomy a more difficult procedure. In 1985 (103 years later), Prof, Dr. Erich Muhe of Germany performed the first Laparoscopic cholecystectomy (LC).[6] Phillipemouret of Lyon, France, performed his first Laparoscopy cholecystectomy in 1987, followed by francoic Dubois of paris, France, In 1988.[6] The

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advantages of laparoscopic cholecystectomy are earlier return to bowel function, less postoperative pain, cosmetics, shorter length of hospital stay and earlier return to full activity[7].

Laparoscopic cholecystectomy (LC) though considered as safe and effective, yet can become difficult at times due to various problems faced during surgical procedure. Various problems encountered includes problem in identifying anatomy, anatomical variation, creating pneumo-peritoneum, accessing peritoneal cavity, releasing adhesions and extracting the gall bladder. LC with these problems along with time taken more than normal is regarded as difficult.[8]

Preoperative assessment of complexity factors is needed for frequent procedures such as (LC) in order to avoid complications and delays and to guarantee an efficient course of surgery.[9] In case of laparoscopic cholecystectomy, preoperative complexity estimation helps surgeons deciding whether to proceed with a minimally invasive approach, perform an open procedure or make a referral to a more experienced surgeon. It may also be useful for explaining the various risks of laparoscopic and open procedures.[10] Although laparoscopic cholecystectomy has generally a low incidence of morbidity and mortality and of conversion rate to open surgery, its outcome is particularly affected by the presence and severity of inflammation, advancing patient's age, male sex and greater body mass index.[11] Previous upper abdominal surgery is associated with a higher rate of adhesions, an increased risk of operative complications, a greater conversion rate, a prolonged operating time and longer stay.[11] Laparoscopic cholecystectomy after endoscopic retrograde cholangiopancreatography (ERCP) with endoscopic sphincterotomy (ES) for combined choledochocystolithiasis is more difficult with prolonged procedure than in uncomplicated gallstone disease with a longer post-operative hospitalstay.[12]

In the era of open surgery, early cholecystectomy found to be beneficial for the management of acute cholecystitis in terms of reducing the morbidity rate and shortening the hospital stay.[13] However, early reports of laparoscopic cholecystectomy for acute cholecystitis frequently showed a higher complicationrate a prolonged operation time and a higher rate of conversion to open surgery.[14] Acute cholecystitis was therefore once considered a relative contraindication for early laparoscopic cholecystectomy. Conservative treatment of acute cholecystitis followed by delayed - interval laparoscopic cholecystectomy became a commonly accepted practice in the early 1990s.[15]

With the growing experience and improvement in laparoscopic skills, recent studies have demonstrated that laparoscopic cholecystectomy is safe for acute cholecystitis[16]. The pendulum has now swung toward early laparoscopic cholecystectomy for the management of acute cholecystitis, as in the era of open cholecystectomy for acute cholecystitis.[17]

The conventional practice for acute cholecystitis is conservative treatment consisting of nothing per oral, intravenous fluid, antibiotics and analgesics followed by interval surgery after at least 6 weeks. The present study will find out the feasibility and safety of an early laparoscopic cholecystectomy in these cases. The objective of this study is to identify per-operative difficulties and early post-operative complications of early

laparoscopic intervention in acute cholecystitis and to find out measures that can be taken when these difficulties and complications arises.

If this study helps us to find out common per-operative difficulties and early post-operative complications arising from this procedure and a way to overcome those difficulties and decrease those complications, it will eventually reduce the morbidity of the patient as well as economic burden of our poor country.

MATERIALS AND METHODS

This descriptive type of observational study was carried out at different wards of Rangpur Medical Hospital, Rangpur from January, 2017 to December, 2017. Total 50 samples were taken by purposive sampling. Patients admitted in the hospital with features of acute cholecystitis and confirmed by sonological examination were included in this study. Patients who had pre-operative findings of other co-morbidities which may influence the post-operative sequelae, patients suffering from acute cholecystitis with generalized peritonitis and patients with acute cholecystitis with choledocholithiasis were excluded from this study.

All samples were included in the study after confirming the ethical issues such as - all participants were volunteer, consent was obtained, it had been clear to them that they are free to take part or refuse any part of the study, all answers were kept confidential.

Age, sex, clinical presentation, number of attack, duration of each past attack, ultrasonographic findings, leucocyte count, laparoscopic findings and difficulties encountered during operation, rate of conversion, causes of conversion, use of drain, post-operative complications were regarded as various variables.

Patients admitted in the hospital through emergency and outpatient department with upper abdominal pain was diagnosed on the basis of clinical history, examination, laboratory data and ultrasonographic findings. During the course of management laparoscopic cholecystectomy was performed. Observations were made of various per-operative findings and encountered difficulties and their solution. Post- operatively patients were mentioned for complications and duration of hospital stay and return to their daily routine.

All the information's were recorded in a fixed data collection sheet. Collected data were classified edited, coded and entered into the computer for statistical analysis. .Collected data was compiled and findings were presented in the form of tables and graphs. Appropriate statistical analysis of the data was done using computer based SPSS version-16.0.

RESULTS

Table I: Distribution of patients according to age (n = 50)

Age (years)	Frequency (%)	Range(years)	Mean+SD
<20	2(4%)		
20 - 29	12(24%)		
30 - 39	12(24%)	14-80	40 ±16.34
40 - 49	8(16%)		
50 - 59	10(20%)		
60 - 69	2(4%)		
≥70	4(8%)		

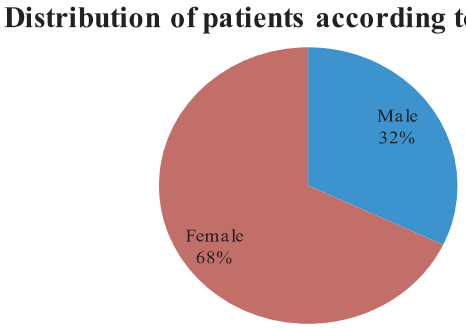

Figure 1: Distribution of patients according to sex (n = 50)

Table II: Distribution of patients according to clinical presentations (n = 50)

Clinical presentations	Frequency (%)
Fever	47 (94%)
Nausea	38 (76%)
Emesis	21 (42%)
Right upper quadrant pain	50 (100%)
Right upper quadrant tenderness	38 (76%)
Murphy's sign positive	35 (70%)

Table III: Distribution of patients according to duration of attack (n = 50)

Duration of symptoms (hours)	Frequency (%)	Range(years)	Mean+SD
<12	2 (4%)		
12 - 24	8 (16%)		
25 - 36	10 (20%)	10 - 54	36 ± 11.36
37 -48	25 (50%)		
<48	5 (10%)		

Table IV: Distribution of patients according to important mean laboratory parameters (n =50)

Laboratory parameters	Values
<12	12900 (10200 -18400)

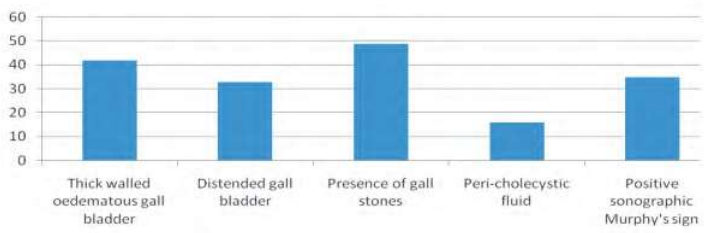

Figure 2: Distribution of patients according to ultrasonographic findings (n = 50)

Table V: Distribution of patients according to per-operative difficulties during laparoscopic cholecystectomy (n =50)

Per-operative difficulties	Per-operative difficulties
Dense adhesions (omental /surrounding structures)	40 (80 %)
Obscure anatomy of Calot's triangle	3 (6%)
Distended gall bladder	43 (86%)
Bleeding from cystic artery	2(4%)
Port Site bleeding	1 (2%)
Bile duct injury	3 (6%)
Perforation of gall bladder with spillage of stone	4 (8%)

Table VI: Distribution of patients according to early post-operative complications (n =50)

Post-operative complications	Frequency (%)
Wound infection	2 (4%)
Fever	5(10%)

DISCUSSION

Acute cholecystitis occurs in upto 10% patients with gallstones and is more likely if gallstones have previously being symptomatic.[18] According to Tokyo guidelines, diagnostic criteria for acute cholecystitis, are the presentation with one local sign or symptom (Murphy's sign, pain or tenderness in the right upper quadrant, mass in the right upper quadrant), one systemic sign (Fever, leukocytosis, elevated C- reactive protein level) and a confirmatory finding on an imaging test (ultrasonography or hepatobiliaryscientigraphy).[19]

Sonographically, diagnostic characteristics of acute cholecystitis are a thick walled (>3mm) often distended gall bladder containing gallstones (one of which may be impacted in hartman's pouch) and pericholecystic fluid collections.[20] Most patients respond to conservative treatment with analgesics, intravenous fluids, gastrointestinal rest and antibiotic therapy and a planned elective cholecystectomy is carried out at an interval of 6-8 weeks. However this strategy has been questioned for several reasons. There is a high rate of morbidity amongst patients during this interval with higher readmission rate (29-40%) with an additional financial burden to thepatients.[21]

The most common reasons for difficulty during LC are severe inflammation, dense adhesions and bleeding. Severe inflammation and high vascularity as in the case of acute cholecystitis, lead to difficulty in defining the anatomy of Calot's triangle and is associated with increased risk of bleeding. Besides this, impacted stone at the neck may be associated with difficulty in gripping the inflamed and friable gallbladder. Dense adhesions also make it difficult to define the anatomy of the Calot's triangle. Separation of a gall bladder from the GB fossa is also more difficult in such patients.

In our study, the highest number of patients were from the 30-39 years of age group (24%) and 20-29 years of age group (24%) which was subsequently followed by 50-59 years age group (20%). The mean age of the respondents here was 39.88±15.45 years which was very nearer to the another previous Bangladeshi study done by Md. Ibrahim Siddique et al in 2012.[22]

The sex distribution proclaimed that out of 50 patients 16(32%) were male and rest 34 (68%) were female. The male to female ratio in this study was 1:2.13 which was 1: 1.45 in the above mentioned study.[22]

Feasibility of laparoscopic procedure and operative time depends on a number of factors. Experience and skill of the surgeon, difficulties in releasing adhesions per-operatively, excessive oozing or bleeding, instrumental handling of a distended thick walled often friable gall bladder, need for gallbladder decompression and spillage of gall bladder contents are important determinants for operative time. In earlier years, several studies reported mean operation time ranging from 60 minutes to 108.2 minutes.[23] We have got mean operation time in our study was 48 minutes (data not shown).

Peritoneal adhesions may be mild, moderate or extensive according to extent as reported by Saber in his experimental work.[24] In our study, we have got total 90% patients with omental and surrounding structure adhesion. It was beyond the scope of determination of different categories of adhesion in our study. Many studies of same interest reported that previous upper abdominal surgery is associated with a higher rate of adhesions, an increased risk of operative complications, a greater conversion rate, a prolonged operating time and longer stay.[25] Incidence of operative bleeding in many series was up to 10% with an average figure of 2%[26]. The most important patient-related risk factors of operative bleeding are acute cholecystitis, liver cirrhosis, previous abdominal surgery, peritoneal adhesion and anatomical abnormalities.[27] Our data came in agreement with these results as we observed that operative bleeding was 6% in patients with acute cholecystitis, fibrotic gall bladder and extensive peritoneal adhesion. Among these 3 (6%) patients 2 had bleeding from cystic artery and 1 had from port site.

Bile duct injury is the most serious complication during cholecystectomy, leading to conversion and is associated with significant morbidity. In our study we have three patients (6%) with bile duct injury which were repaired with T-tube kept in situ. There is a general belief that initial conservative treatment for acute cholecystitis increases the chance of successful laparoscopic cholecystectomy at a later date, for the ducts are more easily displayed at this stage. This is probably not true as severe attack of acute cholecystitis involving the tissues outside the gallbladder results in the formation of an inflammatory mass which resolves slowly and if cholecystectomy is delayed, dense scar tissue will have formed between Hartman's pouch and the common bile duct, rendering exposure of the ducts far from easy.

Dulemba et al[28] reported that spilled stones floating free in the peritoneal cavity may migrate to the pelvic area and become embedded there in the cul-de sac, causing a severe reaction. Due to the subsequent inflammatory reaction, the fertility may be adversely affected in a female. In the present study also, there were technical problem of gallbladder injury with spillage of the stones in four (8%) patients who had also other complications simultaneously. These stones were retrieved by extraction with a grasping forceps and laparoscopic suction. The procedure was completed without conversion. Retrieval of spilled stones can be done by pressure ejection, laparoscopic hovering and use of retrieval bags.[29]

In our study, 2 patients (4%) developed wound infection with mild discharge in the postoperative period. All the 2 patients who

developed wound infections were those converted into open cholecystectomy during surgery because of bile duct injury. Williams et al[30] reported wound infection rates of 0.5% in successfully performed laparoscopic cholecystectomies and infection rate of 3.6% in patients requiring conversion.

Similarly, Taragaronaet al[31] concluded that small biological impact induced by laparoscopy is followed by a greater preservation of the immune response as compared to the open procedure, thus lowering the incidence of infectious complications.

Five patients (10%) developed fever in the immediate post-operative period. Two of these patients were those who were converted to open cholecystectomy because of intra-operative problems while one patient had successfully undergone laparoscopic cholecystectomy. One of the patients of acute cholecystitis undergoing laparoscopic cholecystectomy developed fever in the immediate post-operative period which remained only for 1 day. The fever was associated with wound infection in both the cases of open cholecystectomy. The fever got relieved by giving anti-pyretics and appropriate treatment of the wound infection.

The mean hospital stay in successful laparoscopic cholecystectomy was 3.28±2.6 days) which was almost similar to the reports of Hardeep Sing Gill and his colleagues.[32]

CONCLUSION

Laparoscopic cholecystectomy is the procedure of choice for management of symptomatic gallstone disease which could at times is an easy procedure conducted in a short time whereas occasionally, it can be a difficult procedure extending to a longer duration of time. Per-operative difficulties especially dense adhesions, thick walled gall bladder, gangrenous gall bladder findings in laparoscopic cholecystectomy are the utmost culprits that may ensure different post-operative complications. Among the post-operative complications fever, SSI were the most significant.

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Original Article

The Association among Thyroid- Stimulating Hormone, Thyroid Hormones and Risk of Papillary Thyroid Cancer: A Single Center Case Control Study.

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ABSTRACT

INTRODUCTION: *The effects of thyroid-stimulating hormone (TSH) and thyroid hormones on the development of human papillary thyroid cancer (PTC) remain poorly understood. Thyroid nodules are very common. On the basis of differences in iodine nutrition the prevalence of 4 -7%. In United States the prevalence of thyroid cancer accounts for 1% of all new malignancies clinically, although the annual incidence is reported to be rising. Therefore, diagnosis of thyroid nodules represents a challenge, mainly because of the need to identify thyroid malignancy so as to avoid unnecessary thyroid surgery in patients with benign nodules. Thyroid cancer has the highest prevalence of all endocrine malignancies, and its incidence is rising faster than any other malignancy in both men and women.* ***OBJECTIVES:*** *To assess the relation among thyroid- stimulating Hormone, thyroid hormones and risk of papillary Thyroid cancer.* ***METHODS:*** *Case control study was conducted in the Department of Otolaryngology and Head Neck Surgery in Prime Medical College Rangpur. The patients came at outpatient department from August 2021 to April 2022 were included in this study.* ***RESULTS:*** *Compared to the middle tertile of TSH levels within the normal range, serum TSH levels below the normal range were associated with an elevated risk of PTC among women (OR=3.74, 95% CI: 1.53, 9.19) but not men. TSH levels above the normal range were associated with an increased risk of PTC among men (OR=1.96, 95% CI: 1.04, 3.66) but not women. The risk of PTC decreased with increasing TSH levels within the normal range among both men and women (P trend=0.0005 and 0.041, respectively).* ***CONCLUSION:*** *the present study showed a significantly increased risk of PTC associated with TSH levels lower than the normal range among women and higher than the normal range among men. The observed associations varied by histological subtype and tumor size.*

Key word: Thyroid stimulating hormone, papillary thyroid carcinoma, thyroid hormone.

INTRODUCTION

Thyroid nodules are very common, with an estimated prevalence of 4 -7% by palpation[1] depending on differences in iodine nutrition.[2] Clinically overt thyroid cancer accounts for 1% of all new malignancies in the United States, although the annual incidence is reported to be rising.[3] Therefore, thyroid nodules represent a diagnostic challenge, mainly because of the need to identify thyroid malignancy so as to avoid unnecessary thyroid surgery in patients with benign nodules.[4] Thyroid cancer has the highest prevalence of all endocrine malignancies, and its incidence is rising faster than any other malignancy in both men and women.[5] In the United States, thyroid cancer is the 9th most common cancer, accounting for 3.8% of all malignancies and 0.3% of all deaths from cancer.[6] The most common histological type of thyroid cancer is papillary thyroid cancer (PTC), which accounts for more than 80% of all thyroid carcinomas.[7]

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Follicular thyroid cancer (FTC) is the second most common type of thyroid malignancy worldwide after papillary thyroid cancer. It's incidence, however, is higher than papillary thyroid cancer in geographic areas of endemic goiter, accounting for 25%-40% of cases in areas of iodine deficiency compared to 10% of all cases of thyroid malignancy in iodine-sufficient areas.[8] Thyroid cancer incidence has doubled since 1990 and it is estimated that 60,000 new cases will be diagnosed this year though the mortality rates remain stable. It is more prevalent in women and is usually diagnosed at an earlier age compared to other adult cancers.[9] Follicular and papillary types of thyroid cancers are classified as differentiated and have a better prognosis compared to the anaplastic form, which is undifferentiated and more aggressive.[10] Peak incidence of follicular thyroid cancer in the US is between 30 and 60 years of age, with a female to male ratio of 3:1.[8] Thyroid-stimulating hormone (TSH) is the major growth factor for thyroid cells and regulator of thyroid functions. It controls the processes that lead to increased thyroid hormone production and secretion.[11] Blood concentrations of thyroid hormones (i.e., triiodothyronine [T3] and its prohormone thyroxine [T4]) inversely regulate the release of TSH through a negative feedback loop at the pituitary levels. High TSH levels have been associated with PTC pathogenesis in a mouse model.[12] Suppression of TSH is currently recommended to manage differentiated thyroid cancer (DTC) patients, which has shown benefits to patient survival[13]. Thyroid hormones have also been suggested to have a tumor promoting effect on several cancers, including pancreatic, breast, ovarian, and prostate cancer.[14] However, findings of epidemiological studies linking TSH and thyroid hormones to the risk of thyroid cancer have been inconsistent.[15]

MATERIALS AND METHODS

The study population was taken from department of Otolaryngology and Head Neck Surgery in Prime Medical College Rangpur. The patients came at outpatient department from August 2021 to April 2022 were included in this study. A calibrated Immulite 1000 (Siemens) analyzer was used to measure the serum concentrations of TSH and thyroid hormones using the manufacturer's reagents and calibrators. TSH was captured between two monoclonal antibodies (one was biotinylated, the other labeled with a ruthenium complex) which specific for sterically non-interfering epitopes of human TSH. TT3 and TT4 were dissociated from binding proteins using 8-anilino-1-naphthalene sulfonic acid (ANS) and competed with the exogenous biotinylated-T3 or -T4 for binding to a T3- or T4-specific antibody labeled. The intensities of the luminescence were inversely proportional to the serum concentrations of TSH and thyroid hormones. The normal ranges for serum concentrations of TSH, TT3, TT4, and FT4 were 0.3-4.2 mU/ml, 79-149 ng/dl, 5.0-10.6 mg/dl, and 0.80-1.80 ng/dl, respectively. All control samples were tested in the same batch as their matched case samples. Based on results obtained from quality-control samples (5%), intra-batch coefficient of variation ranged from 3.9% to 7.7%.

Statistical analyses

This is a case-control study. 55 patients were taken for the study. The correlations between TSH, TT3, TT4, and FT4 were estimated using the Pearson correlation coefficients. Given the individual-matched case-control design, conditional logistic regression analyses were employed to calculate odds ratios (ORs) and

RESULTS

All serum samples were drawn newly diagnosed with PTC. As anticipated, there were statistically significant strong positive correlations between TT3, TT4, and FT4 (r=0.68 for TT3 and TT4, p<0.0001; r=0.40 for TT3 and FT4, p<0.0001; and r=0.52 for TT4 and FT4, p<0.0001, respectively). TSH was weakly, but statistically significantly correlated with TT3, TT4, and FT4 (r=-0.06 for TSH and TT3, p=0.022; r=-0.17 for TSH and TT4, p<0.0001; and r=-0.19 for TSH and FT4, p<0.0001, respectively). Female cases had lower mean TSH levels as compared to their matched controls, while male cases had higher mean TSH levels as compared to their matched controls. None of these differences were statistically significant.

Table I: Distributions of selected characteristics among PTC cases and matched controls.

Age at diagnosis(year)	Case n=55	Number%	Case n=55	Number%	p value
<30	15	28.3	15	27.4	0.92
30-39	23	41.7	24	43.5	
40-49	14	25	13	24.2	
>50	2	5	2	5	
Gender					1.00
Male	30	54	30	54	
Female	25	46	25	46	
BMI (kg/m^2)					0.23
<25	19	34.6	21	38.5	
25-29.9	11	20	10	17.4	
>30	25	54.6	24	44.1	

We also observed non-significantly higher mean levels of thyroid hormones among female cases as compared to female controls, but thyroid hormone levels were similar between cases and controls among men.

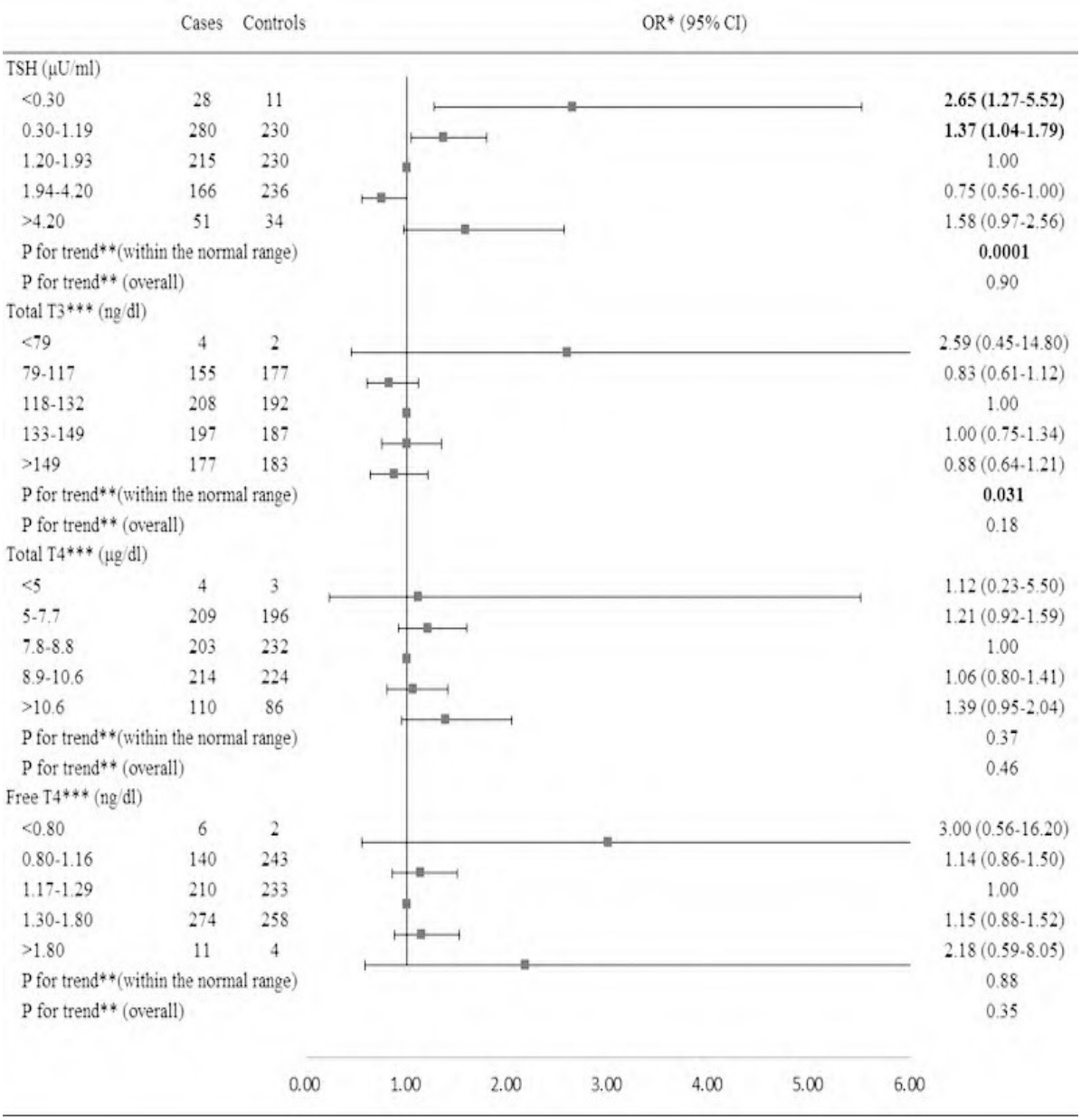

Figure 1: Risk of PTC associated with serum concentrations of TSH and thyroid hormones

In the overall population, serum TSH levels below the normal range were associated with a significantly increased risk of PTC (OR=2.65, 95% CI: 1.27, 5.52, Figure 1) compared to the middle tertile of the normal range.

Table II: Blood concentration level of Thyroid stimulating hormone and Thyroid hormone.

Age (years)	Frequency (%)	Range(years)
<0.30	5	3
0.30-1.19	15	14
1.20-1.93	18	13
1.94-4.20	12	18
>4.20	5	7
Total T3 (ng/dl)		
<79	2	1
79-117	12	15
118-132	18	17
133-149	13	12
>149	10	10
Total T4 (ng/dl)		
<5	2	3
5-7.7	12	11
7.8-8.8	12	15
8.9-10.6	18	19
>10.6	11	7
Free T4 (µg/dl)		
<0.8	4	3
0.8-1.16	11	18
1.17-1.29	16	17
1.30-1.80	18	15
>1.80	6	2

Paradoxically, TSH levels above the normal range were also associated with an increased risk of PTC (OR=1.58, 95% CI: 0.97, 2.56) with borderline significance. Serum concentrations of TT3, TT4, and FT4 below or above the normal range were not significantly related to an elevated risk of PTC. Within the normal ranges, the risk of PTC decreased with increasing TSH levels (P trend=0.0001) and with decreasing TT3 levels (P trend=0.031), but no dose-response relationships were observed for TT4 and FT4. TSH levels below the normal range were associated with increased risk of PTC among women (OR=3.74, 95% CI: 1.53, 9.19) but not among men (OR=1.07, 95% CI: 0.25, 4.62, Figure 2) compared to the middle tertile of the normal range.

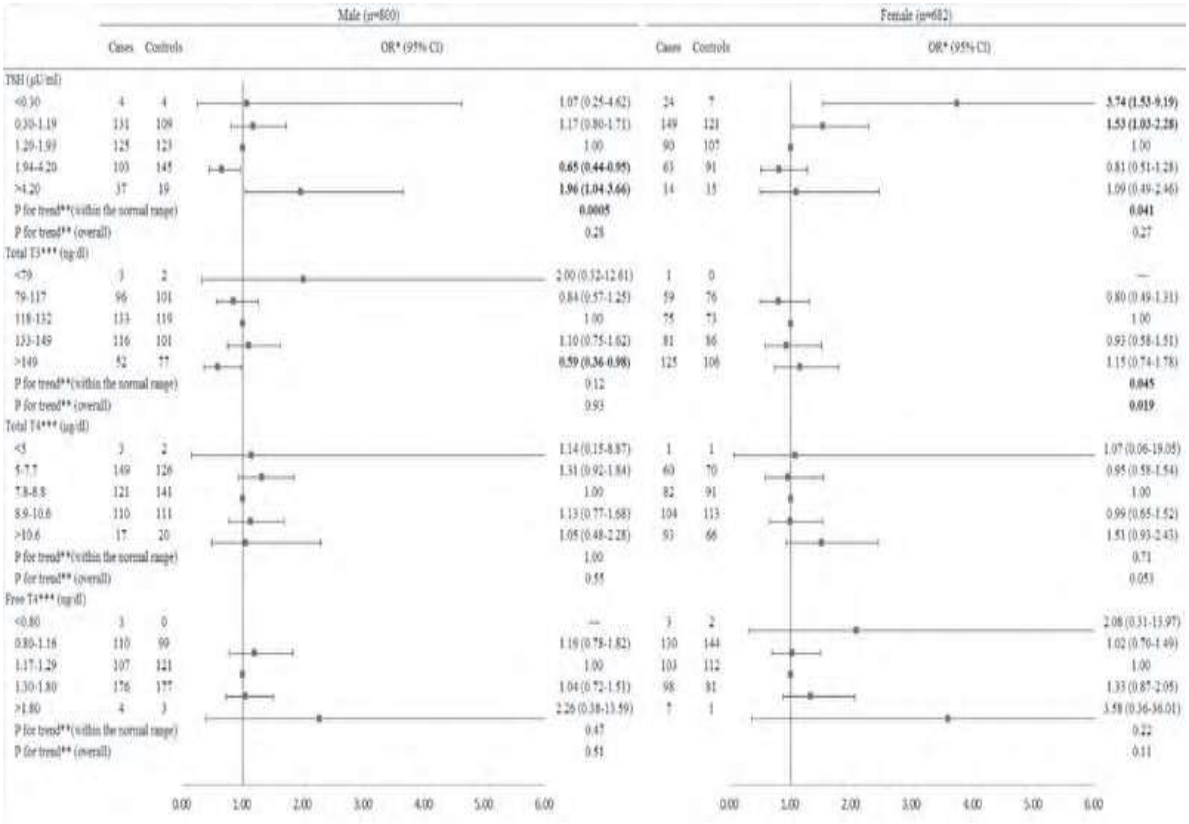

Figure 2: Risk of PTC associated with serum concentrations of TSH and thyroid hormones, stratified by gender.

Additionally, an increased risk of PTC in relation to TSH levels above the normal range was observed only among men (OR=1.96, 95% CI: 1.04, 3.66) but not among women (OR=1.09, 95% CI: 0.49, 2.46). The risk of PTC decreased with increasing TSH levels within the normal range among both men and women (P trend=0.0005 and 0.041, respectively). However, lower TSH levels within the normal range were associated with an increased risk of PTC and the association was stronger in women (OR=1.53, 95% CI: 1.03, 2.28) than in men (OR=1.17, 95% CI: 0.80, 1.71). In contrast, higher TSH levels within the normal range were associated with a reduced risk of PTC among men (OR=0.65, 95% CI: 0.44, 0.95). An inverse association between TT3 levels above the normal range and risk of PTC was observed only among men (OR=0.59, 95% CI: 0.36, 0.98); while the risk of PTC increased with increasing serum concentrations of TT3 among women (overall P trend=0.019). No significant associations with TT4 and FT4 were observed.

DISCUSSION

In this case-control study based on serum measures and with sufficient power to stratify by gender, we found that serum TSH levels below the normal range were associated with an elevated risk of PTC among women but not men. TSH levels above the normal range were only associated with an increased risk of PTC among men. There was an inverse association between PTC and TSH levels within the normal range among both men and women. The observed associations varied somewhat by histological subtypes (classical vs. follicular variant PTCs) and by tumor size (≤10mm vs. >10mm) among men and women. The gender effect on the association between TSH and PTC was only observed among classical PTC cases. TSH levels showed a stronger association with PTC with larger tumor size. A suggestive inverse association between higher TT3 levels and risk of PTC was observed among men. The inverse trends between TSH levels and risk of PTC observed in the present study was in accordance with results from a nested case-control study within a large population-based prospective cohort in Europe.[16] The cohort consisted of approximately 520,000 healthy individuals aged 35 to 69 years when recruited between 1992 and 1998 in 10 European countries. A total of 357 incident thyroid cancer cases (57 men and 300 women) diagnosed during 1992 to 2009 and 767 matched controls were included in the analyses. Blood samples were collected at enrollment. This European study found an inverse dose-response relationship between overall TSH levels and risk of differentiated thyroid cancer. The years between sample collection and thyroid cancer diagnosis were similar between the European study and our study. However, as compared to the European study, our population was younger and healthier[17], with participants aged 17 to 56 years at blood samples collection. Additionally, our study had a larger number of the male cases than the European study, which provides sufficient power to examine the associations among men. The present study observed inconsistent associations between TSH levels and risk of PTC among women as compared to men, while the European study reported similar associations among men and women. There were another two prospective studies with smaller sample size that investigated the association between TSH and risk of thyroid cancer. Although no significantly inverse association was observed in these studies, both reported lower TSH levels among thyroid cancer cases as compared to controls. A previous meta-analysis showed that higher TSH levels were associated with an increased thyroid cancer risk.[17] However, all 22 studies included in the meta-analysis were cross sectional studies and measured TSH levels after treatment of thyroid cancer began. The cross-sectional design could not clarify whether elevated TSH levels preceded thyroid cancer diagnosis or were effects of treatment. The low levels of thyroid hormones due to dysfunction of the thyroid gland among thyroid cancer patients could cause the pituitary gland to release more TSH. Additionally, higher TSH levels may promote the growth of already initiated thyroid cancer, making the cancer larger and more easily diagnosed. Therefore, the positive association seen in the cross-sectional studies could be due to ascertainment bias.10 On the other hand, controls in these studies were always patients with thyroid nodules or patients undergoing surgical treatment for a suspicious thyroid tumor. Some nodules can produce high levels of thyroid hormones, thus lowering TSH levels.

CONCLUSION

In conclusion, the present study showed a significantly increased risk of PTC associated with TSH levels lower than the normal range among women and higher than the normal range among men. The observed associations varied by histological subtype and tumor size. These results could have significant clinical implications for physicians who are managing patients with abnormal thyroid functions and those with thyroidectomy. Future studies are warranted to further understand these associations.

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Prime Medical Journal. July 2022; 12(2): 23-29

Original Article

Serum Creatinine and Serum Urea Status in Overweight Male Adults.

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ABSTRACT

BACKGROUND: *Overweight and obesity has been announced as a global epidemic by the World Health Organization which is strongly associated with renal function impairment.* ***OBJECTIVES:*** *To evaluate the serum creatinine and urea status in overweight male adults.* ***METHODS:*** *This cross sectional analytical study was conducted in the Department of Physiology, Rangpur Medical College, Rangpur. After briefing about objectives, a total 60 male subjects who met the inclusion and exclusion criteria were enrolled in the study with permission. Among them 30 were apparently healthy adult male with normal weight (Group-A) and 30 were apparently healthy overweight adult male (Group-B). The subjects were selected from different areas of Rangpur city. Their body mass index, serum creatinine and serum urea were measured. For statistical analysis, unpaired students "t" test was performed by computer based SPSS-25.0 for windows where p?0.05 was accepted as significant.* ***RESULTS:*** *The mean serum creatinine level and the mean serum urea level were significantly ($p<0.001$and $p<0.01$respectively) higher in overweight male adults than normal weight male adults.* ***CONCLUSIONS:*** *From this study it is evident that increased body weight is associated with elevated serum creatinine and serum urea levels in overweight male adults.*

Key word: Overweight, serum creatinine, serum urea, body mass index.

INTRODUCTION

The global epidemic of overweight and obesity termed "globesity", is the major public health problem in developed as well as developing world.[1] In 2016, more than 1.9 billion adults aged 18 years and older were overweight worldwide.[2] The rate of being overweight or obese climbed from 7% in 1980 to 17% in 2013 for Bangladeshi adults.[3] Overweight and obesity are the fifth leading preventable cause of death worldwide.[4] WHO estimated that, 4.5 million deaths worldwide in 2013 were attributable to complications caused by overweight and obesity.[5]

Overweight denotes the presence of excess body weight[6], where abnormal or excessive fat accumulation occurs to the extent that normal health functions may be impaired. The fundamental cause of overweight and obesity is an energy imbalance between consumed and expended calories.[2] Now a day, this effect has been attributed to the dietary changes and reduced physical activities.[7]

Body mass index (BMI) is a simple index of weight-for-height that is commonly used to classify overweight and obesity in adults[2]. The regional office of World Health Organization for Western Pacific Region, The International Association for The Study of Obesity And The International Obesity Task Force have

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categorized normal weight as BMI 18.5 to 22.9 kg/m^2, overweight as BMI 23 to 24.9 kg/m^2 and obesity as BMI 25 kg/m^2 or higher for the Asian adults.[7] When body weight is >20% above average, mortality rises 20% in men and 10% in women.[8]

The World Kidney Day 2017 promoted education on the harmful consequences of overweight and obesity and its association with kidney diseases.[9] A higher BMI is associated with increased prevalence and incidence of nephrolithiasis. A study on 6475 subjects in UK revealed that increased BMI is directly associated increased CKD. In adult prevalence of CKD is 13% and still growing.[10] 10% of all kidney cancers are attributable to excess body weight. It is also evident that weight loss improves kidney functions.[9]

The concentration of serum creatinine has long been the most widely used and commonly accepted measure of renal function in clinical medicine.[11] Elevated blood urea nitrogen represents an independent marker of renal dysfunction. A study in India suggested that rise of serum creatinine and urea should be regarded as a precursor of renal function loss in overweight and obesity.[12]

The renal consequences of excess body weight may occur at an early state before the clinical manifestations become apparent. To the best of our knowledge very few studies have been carried out in our country to see the effect of weight gain on renal functions. Therefore, this study has been designed to assess serum creatinine and serum urea in overweight individuals, which would emphasize screening of overweight male adults as an at-risk population.

MATERIALS AND METHODS

Study design and sample:

This cross sectional analytical study was conducted from January 2019 to December 2019 in the Department of Physiology, Rangpur Medical College, Rangpur. The study protocol was approved by Rangpur Medical college ethical committee and thesis protocol review committee. Total numbers of 60 male adults ageing from 20-40 years from different areas of Rangpur city, who fulfill the inclusion criteria were included by numbering. After selection of subjects, the objectives and procedures of study were explained in detail and their informed written consent 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 30 normal weight male adult were denoted as group A and 30 overweight male adult were denoted as group B. The subjects included in each group were matched in their age and socio-economic condition. Obesity and history of diabetes mellitus, hypertension, chronic kidney & liver disease, tobacco and alcohol abuse, endocrine disorders (thyroid, adrenal diseases etc.), psychiatric disorder (depression), taking neurotoxic drug were taken as exclusion criteria.

Measurement of body mass index (BMI)[13]:

Height and weight of each individual was measured by measuring tape and medical weighing machine respectively. Body mass index was calculated as the body weight in kilograms divided by square of height in meters.

BMI = Weight in kilograms / Square of height in meters (kg/m^2)

Collection of blood and sample processing

All study subjects were advised to be in overnight (8-10 hrs) fasting state. Then they were asked to attend next day at 8.00 am at the Department of Physiology, Rangpur Medical College, Rangpur. 5 ml of fasting venous blood was collected from ante-cubital vein from each subject under all aseptic precautions by a disposable syringe. Needles were detached from the nozzle and blood was immediately transferred into a de-ionized test tube with a gentle push to avoid hemolysis. The test tubes containing blood were kept in standing position till formation of clot. Serum was separated by centrifuging the blood at 3000mp for 5 minutes. The clear supernatant was taken and kept in ependorffs. Biochemical tests for measurement of serum creatinine and serum urea were carried out as early as possible by enzymatic colorimetric method at the Department of Biochemistry, Rangpur Medical College, Rangpur. All data were recorded systematically in a preformed history sheet and statistical analysis was done by computer using SPSS-25.0 version for windows. Comparison between study groups was done by unpaired students "**t**" test. Regarding the interpretation of results, <0.05 level of probability (p) was accepted as significant.

RESULTS

Table I shows the mean ± SD of age, height, weight and BMI of total 60 adult males.. The mean ± SD of weight were 58.60 ± 5.28kg in group A and 66.13 ± 4.71 in group B. and the mean ± SD of BMI were 21.04 ± 1.43 kg/m^2 in group A and 24.09 ± 0.62kg/m^2 in group B. The value of mean± SD of weight and BMI were significantly ($p<0.001$ and $p<0.001$ respectively) higher in group B than group A.

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

Parameters	Mean ± SD	
	Group A (n=30)	Group B (n=30)
Age (years)	30.10 ± 7.67	33.73 ± 7.20 NS
Height (m)	1.67 ± 0.06	1.66 ± 0.06 NS
Weight (kg)	58.60 ± 5.28	66.13 ± 4.71***
BMI (Kg/m^2)	21.04 ± 1.43	24.09 ± 0.62***

Data was expressed as mean ± SD. Unpaired student's 't' test was performed for comparison.
Group A: Apparently healthy normal weight adult male with BMI 18.5-22.9 kg/m^2.
Group B: Apparently healthy overweight adult male with BMI 23-24.9 kg/m^2.
n = Number of subjects ; SD = Standard Deviation
NS = $p > 0.05$; *** = $p \leq 0.001$

Table II shows the mean ± SD of serum creatinine and serum urea in group A and group B. The mean ± SD serum creatinine were 0.79 ± 0.29 mg/dl in group A and 1.07 ± 0.19 mg/dl in group B. and the mean ± SD serum urea were 16.05 ± 6.39mg/dl in group A and 21.76 ± 7.87 mg/dl in group B. The value of mean ± SD of serum creatinine and serum urea in group B was significantly ($p<0.001$ and $p<0.01$ respectively) higher than group A.

Table II: Mean ± SD of serum creatinine and serum urea level in group A and group B.

Variables	Mean ± SD	
	Group A (n=30)	Group B (n=30)
Serum creatinine (mg/dl)	0.79 ± 0.29	1.07 ± 0.19***
Serum urea (mg/dl)	16.05 ± 6.39	21.76 ± 7.87**

Data was expressed as mean ± SD. Unpaired t test was performed for comparison.
Group A: Apparently healthy normal weight adult male with BMI 18.5-22.9 kg/m^2.
Group B: Apparently healthy overweight adult male with BMI 23-24.9 kg/m^2.
n = Number of subjects ; SD = Standard Deviation
** = $p \leq 0.01$; *** = $p \leq 0.001$
# Normal level of serum creatinine is 0.6-1.2 mg/dl or 53-106 µmol/L for adult male and 0.5-1.1 mg/dl or 44-97 µmol/L for adult female[14].
# Normal level of serum urea is 15 - 40 mg/dl or 2.6-6.6 mmol/L[15].

DISCUSSION

This cross sectional analytical study was carried out to observe the status of serum creatinine and serum urea in overweight male adults. In this study, the mean serum creatinine level was significantly ($p<0.001$) higher in overweight in comparison to the normal weight male adults. These findings are in agreement with those of several studies.[11,12,16,17]

This study also shows that, the mean serum urea level was significantly ($p<0.01$) higher in overweight in comparison to the normal weight male adults, which is also similar to the reports by others.[12]

Increased body weight results in complex metabolic abnormalities that bring harmful

effects on kidney function. It is suggested that, some of these harmful consequences are mediated through diabetes mellitus and hypertension, as the risk of these comorbid conditions are increased by overweight and obesity.[9,18]

Literature review suggested several mechanisms for the elevation of serum creatinine and urea in overweight individuals. This is may be a result of elevated blood pressure due to increased body weight. It causes structural changes and increased metabolic demands by the kidneys. These alterations result in renal hyperfiltration followed by renal damage and loss of nephrons by glomerulosclerosis. Eventually the renal tubules may become ischaemic and gradually atrophic. These changes result in increased blood level of creatinine and urea.[12]

Creatinine production is proportional to the body weight, importantly the muscle mass. The creatinine clearance increases sequentially with increase in body weight (muscle mass, body fat and water) due to increased production and volume of distribution of creatinine along with glomerular hyperfiltration.[16]

The correlation between creatinine and BMI is not only connected to the muscle mass, but also with body fat content of the subjects11. High body fat is related to early inflammatory processes associated with increased renal perfusion and hyperfiltration. Ectopic fat deposition around kidneys and associated compression may initially increase loop of Henle sodium chloride reabsorption, reducing sodium chloride delivery to the macula densa. Via tubuloglomerular feedback it reduces afferent arteriolar resistance and increases renal blood flow, GFR and rennin secretion. Adipocytokines like resistin, adiponectin and leptin are also associated with glomerular hyperfiltration.[17]

Adiposity has direct impacts on kidney induced by its endocrine activity. Adipose tissue produces various adipokines like adiponectin, leptin and resistin. These adipokines are responsible for inflammation, oxidative stress, abnormal lipid metabolism, activation of the rennin-angiotensin-aldosterone system, insulin resistance and increased production of insulin. As a result, specific pathological changes occur in the kidneys. There is increased deposition of renal sinus fat and development of glomerular hypertension and hyperfiltration.[9,10] Increased fat mass also causes increased production of pro-inflammatory cytokines including tumor necrosis factor alpha (TNFα), CRP and interleukin.[6] CRP is a marker of renal injury and a risk marker of renal function loss.[17]

In Overweight person changes occur in the renal hemodynamics that promotes progressive kidney disease. These changes begin in early stage, before overt renal manifestations are clinically apparent. Elevated serum creatinine and serum urea may represent an independent marker of renal dysfunction in overweight individuals.[12]

CONCLUSION

The result of this study suggested that increased body weight is associated with elevated serum creatinine and serum urea levels in overweight male adults. As body weight increases, modifications in the renal system are found, which may precede overt clinical disease. These findings highlight the importance of

recognizing overweight individuals as an at-risk population for the development of impaired renal function. This might help in early diagnosis and could be used to prevent further complications associated with increased body weight. The study was conducted in a selected area; small sample size and were taken purposively. So, it may not be adequate to represent the total population. To be more conclusive the following recommendations are proposed: study with larger sample size, estimation of urinary microalbumin level, serum angiotensin-converting enzyme (ACE) level and serum lipid profile.

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Original article

Comparison of Superior Articular Surface of Head of Radius between Male and Female

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ABSTRACT

CONTEXT: *Radius is an important bone for sex determination. It is helpful for identification of sex in decomposed bodies in a mass disaster when other skeletons are not available. It also helps to design in reconstruction and rehabilitation procedures, for identifying bone morphology. The morphometry of superior articular surface of radial head helps the surgeon to plan preoperatively to design accurate radial head prosthesis and radial head implantation. The morphometry of radius can be used to prepare a baseline data that can be used in anatomy and for future researchers.* ***OBJECTIVES:*** *To determine the dimensions of fully ossified dry human left radius between male and female.* ***MATERIALS AND METHODS:*** *A cross sectional analytical study was carried out in the Department of Anatomy, Sir Salimullah Medical College, Dhaka from January, 2018 to December, 2018. Anteroposterior, transverse and maximum diameter of radial head were measured on 200 fully ossified dry human left radius by metallic wire and digital slide callipers.* ***RESULTS:*** *Mean (±SD) of anteroposterior, transverse and maximum diameter of radial head was significantly higher in male than in female.* ***CONCLUSION:*** *Significant morphometric difference exists between male and female radius.*

Key word: Anteroposterior, Transverse and Maximum diameter of radius.

INTRODUCTION

The radius bone is one of the long bones of the forearm, lies on the lateral side of the ulna. It extends from the lateral side of the elbow to the thumb side of the wrist. At the upper end it articulates with the capitulum of the humerus and forms the elbow joint and at the lower end it articulates with the scaphoid, lunate and triquetral bone and forms the bulk of the wrist joint. The upper end of the radius is narrow and it consists of head, neck and tuberosity.[1]

The size and shape of the radial head is essential for the construction of radial head prosthesis. The measurements of radial head and its angular relationship to surrounding structures are important in surgical techniques like reconstruction.[2] Even for designing and fabrication of prosthesis the data of normal dimensions of radius is needed.[3]

Radius plays a key role in identification of sex in decomposed bodies.[4] Sex determination of an unknown individual is one of the most important steps in medicolegal cases. In 1989 Liu considered that the anteroposterior diameter of radial head was the best for sex estimation. Barrier reported that the single best discriminating variable was maximum head

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diameter with 80% accuracy for male and 82 % accuracy for female. According to Leopold, maximum diameter of radial head is 94.93 % accurate for estimating sex.

The morphometric data of normal dimensions of radius is needed to find out valuable data of radius which can enrich the knowledge of anatomy. The data will provide valuable information in archeological cases to identify unknown bodies. It will also be helpful for future researchers.

Therefore the present study is taken up to have a baseline data regarding the dimensions of radius. As the radius is resisting degeneration for a long time unlike other bones the present study was undertaken to study radius for various morphological features.

METHODS

Study design and sample:

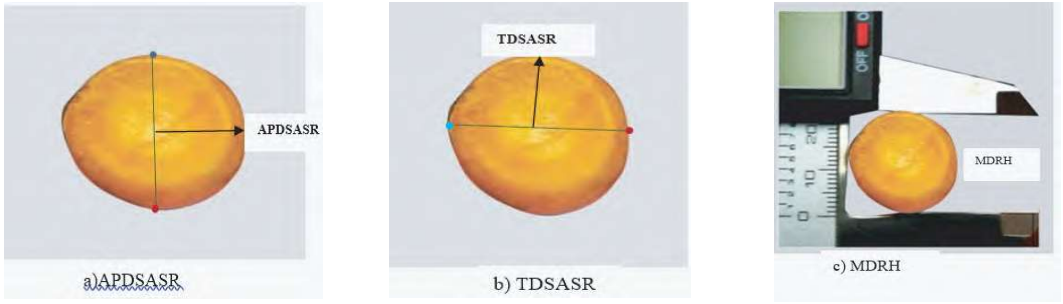
A total Two hundred (200) fully ossified dry human left radius of unknown sex were collected from the medical students of different government and private medical colleges. Broken or incomplete bone, congenitally deformed bones were excluded from the study.
Then the sex of the collected left sided adult radius was determined according to morphological criteria. After that, the sex of the radius was determined by linear discriminant function analysis technique.[5]

The discriminant function analysis is (DFA) = Constant+ co-efficient x variable $Z= b_o + b_1 \times 1$

Here, Z= Discriminant function
b_o= Constant
b_1= co-efficient
X_1= variable
In this study the value of Z for each specimen was calculated by substituting value of the variable in a linear function. A sectioning point was created by mean discriminant score which were also known as the group centroids or sectioning point. A value higher than the sectioning point was considered to be male and a value below it was considered to be female. Linear discriminant function analysis technique was applied to collect data for determination of sex by using computer based software, Statistical Package for Social Science (SPSS) version 20. By discriminant function analysis technique the sex was determined and the grouping was done.

Operational definitions:

Anteropoterior diameter of superior articular surface of the radius (APDSASR): Maximum distance between the anterior and posterior border of superior articular surface of radial head.[6]
Transverse diameter of superior articular surface of the radius (TDSASR): Maximum transverse diameter of superior articular surface of radial head.[6]
Maximum diameter of radial head (MDRH): Largest diameter measured while the digital caliper rotates around the convexity of radial head.[7]



Photograph 1: a) Measurement of anteroposterior diameter of radial head (APDSASR)
b) Measurement of transverse diameter of radial head (TDSASR)
c) Measurement of maximum diameter of radial head (MDRH).

Procedures for measurement of different variables:

Digital slide calliper and metallic wire were used for the measurements of the variables. Sexes of the collected radius were determined by stepwise discriminant function analysis technique and grouped into male (109) and female (91). Anteroposterior diameter and transverse diameter was measured by flexible metallic wire. Then the wire was measured with a digital slide caliper and recorded. Maximum diameter of radial head was measured directly with a digital slide caliper and then recorded. All the variables were measured three times and the average values of each variable was taken and recorded in millimeter. The study was approved by the Ethical Review Committee of Sir Salimullah Medical College, Dhaka.

RESULTS

The results are shown in Table I and Figure 1.

Table I: Anteroposterior diameter, transverse diameter and maximum diameter of radial head in male and female

Variables	Male (n= 109) Mean± SD	Female (n= 91) Mean± SD	P value
Anteroposterior diameter of radial head (mm)	21.91 ±0.72 (19.24- 25.35)	18.22 ±0.96 (12.60 - 21.58)	0.000*
Transverse diameter of radial head (mm)	21.26 ±0.95 (17.10- 23.50)	18.71 ±1.10 (17.01 - 22.10)	0.000*
Maximum diameter of radial head (mm)	22.16 ±1.31 (18.22- 23.79)	20.16 ±1.15 (17.22 - 21.79)	0.000*

Figure in parenthesis indicate range. SD = standard Deviation.
Comparison of values between male and female was done by Unpaired student's ' t' test
** = value< 0.01, n= sample size

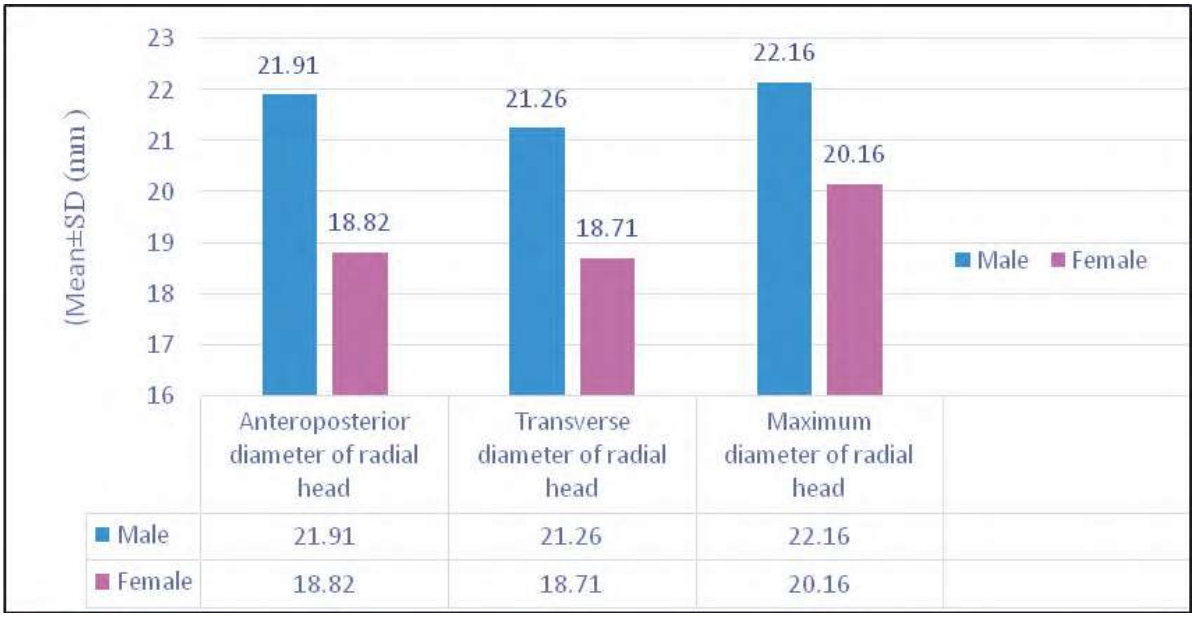


Fig 1: Bar diagram showing anteroposterior diameter, transverse diameter and maximum diameter of radial head in male and female

The findings of the present study were found higher in male than in female and were statistically significant ($p< 0.01$).

DISCUSSION

There are some factors such as genetics, environment, nutrition, life style and social status that might be responsible for affect the bone growth. Mechanical loading, occupation and activity patterns may affect the shape and strength of the bone over time. For the most part of the world males tend to be taller, larger and more robust than their female counterparts.[4] Some different physical traits are observed within this bone which distinguish male from female. In the present study male values were higher than female. The measured value of the present study was found similar to the findings reported by Sakaue[8] (2004) who studied on Japanese population,[6,9] who studied on Indian population[4], (2008) who studied on South African population,[7] who studied on Black and White North American population. In their study they reported anteroposterior, transverse and maximum diameters of radius were higher in male than in female.

CONCLUSION

Significant morphometric differences exist between male and female radius.

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Original article

Effects of Tobacco Consumption on Serum Albumin and Serum Bilirubin Levels in Tobacco Chewers.

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ABSTRACT

BACKGROUND: *In the recent decades there has been a massive global increase in tobacco use. In Bangladesh people use tobacco in both smoking and or smokeless tobacco form. High consumption of tobacco chewing may cause alteration of liver function.* ***OBJECTIVES:*** *To observe the effects of tobacco consumption on liver functions in tobacco chewers.* ***METHODS:*** *This cross-sectional analytical study was conducted from January 2017 to January 2018 in the Department of Physiology, Rangpur Medical College, Rangpur. A total number of 60 subjects were selected, among them 30 were apparently healthy non-tobacco chewer non-smoker subjects as control group (group A) and 30 were apparently healthy tobacco chewer non-smoker subjects as study group (group B). The subjects were selected from different areas of Rangpur city. The effects of tobacco chewing on liver function were studied by measuring the levels of serum albumin and serum bilirubin. For statistical analysis independent sample "t" test was performed by computer based software SPSS-17.0 version for windows.* ***RESULTS:*** *Serum albumin and serum bilirubin levels were significantly lower ($p< 0.001$) in tobacco chewer non-smoker subjects as compared with the healthy control subjects.* ***CONCLUSION:*** *The decreased serum albumin and serum bilirubin levels in tobacco chewer non-smoker subjects were evidence of development of liver function impairment due to tobacco chewing. This might offer a new approach to liver function impairment prevention in tobacco chewers.*

Key word: Tobacco chewer, Albumin, Bilirubin.

INTRODUCTION

Tobacco is a product prepared from the plant by curing them, which contains the alkaloid nicotine that is an extremely addictive drug.[1,2] In addition to nicotine, tobacco contains thousands of other chemicals such as cresol, pyrene, DDT, carbon monoxide, ammonia, hydrogen cyanide, acetone, methanol, formaldehyde, arsenic, cadmium etc.[3,4] Dried tobacco leaves are mainly used for smoking in cigarettes, cigars, pipe tobacco and flavored shisha tobacco. They can be also consumed as snuff, chewing tobacco and dipping tobacco.[1] There are two kinds of commonly used tobacco products in Bangladesh i.e. smoking and smokeless tobacco products. Smokeless tobacco products used include a wide range: betel quide with zarda only or zarda with supari; pan masla with tobacco; sadapata chewing; ghul, khoinee etc.[4]

Tobacco consumption is one of the leading causes of premature death, disease and disability in the world. In Bangladesh 43.3% adults (41.3 million) use tobacco in smoking and or smokeless tobacco form. More than five million people die globally each year due to tobacco related illness, the figure expected to increase to 8.3 million by 2030.[5,6]

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Tobacco consumption in any form has negative consequences on health and it has become a significant public health concern around globe.[5] The short term effects of chewing tobacco are addiction to nicotine, receding gums, permanent teeth loss, sensitive teeth, tooth decay, sores, patches and lumps in mouth, stained teeth etc. Long term effects of tobacco chewing have many adverse effects on the heart and may cause several types of cancers eg. lung, pancreas, breast, kidney, liver and different organs.[2]

Like cigarette smoking smokeless tobacco is also addictive and carcinogenic. It is being made available in many forms and cheaper, which is used by literates and illiterates as an alternative to tobacco smoking. Smokeless tobacco products are used without combustion. According to the manner of administration and to the content of various toxic products, including nicotine and tobacco-specific nitrosamines the use of smokeless tobacco may result in other health hazards, locally and systematically. Chewing tobacco contains more than two dozen cancer causing ingredients.[7]

Now a days the adverse effects of tobacco chewing on liver function have gained more attention, because it is a major preventable cause of morbidity and mortality. Tobacco chewing and cigarette smoking are considered to be the most common particular risk factor for the liver function disorder.[7,8]

In tobacco chewers three to four times more nicotine concentration has been observed than that of cigarette smoker. Nicotine stays for a longer time in blood and inhibits antigen mediated signaling in T-cells, which block the proliferation and differentiation of lymphocyte and suppression of antibody forming cells. Again, nicotine may causes inflammation of liver as its metabolites leads to increased production of pro-inflammatory cytokines (IL-1, IL-6 and TNF- α) and decrease in antioxidant enzymes like hepatic glutathione, glutathione peroxidase, Super oxide dismutase and catalase and increased lipid peroxidation[7]. It has been observed that hepatic lipid peroxidation induced damage to the DNA at first cause DNA mutation, then hepatocellular carcinoma in smokeless tobacco user.[7]

It has been observed that smoking has declined consistently over the last few years due to vigorous efforts toward increase awareness of adverse effects of tobacco, however, the use of smokeless tobacco and snuff has greatly increased.[9]

The purpose of this study was to assess the effect of tobacco on some hepatic parameters in tobacco chewer subjects of northern region 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 unjudicial tobacco use on hepatic system.

METHODS

This Cross-sectional analytical study was conducted in the Department of physiology, Rangpur Medical College, Rangpur from January 2017 to December 2017. The Rangpur Medical college ethical committee and thesis protocol review committee approved the study protocol. Total numbers of 60 apparently healthy subjects of both sexes with age 30-45 years were divided into following groups: Group A - 30 apparently healthy non-tobacco chewer non-smokers and Group B - 30

apparently healthy tobacco chewers non-smoker. The subjects included in each group were matched in their age and socio-economic condition. The duration of smoking was more than three years. All the subjects were free from history of liver, heart, lung and other chronic systemic diseases, obesity and diabetes mellitus, hypertension, pregnancy and lactating mother. After selection of subjects, the objectives and the procedure of the study was explained and written consent was taken. A standard questionnaire was filled after taking history and through clinical examinations. At first day all the subjects were advised to be overnight (8-10 hrs) fasting state. Then they were asked to attend next day at 8.00A.M. in the Department of Physiology, Rangpur Medical College, Rangpur. Fasting venous blood sample was collected from the antecubital vein from each subject under all aseptic precaution by a disposable syringe. The test tube containing blood was kept in standing position till formation of clot. Serum was separated by centrifuging the blood at 3000 rpm for 5 minutes. The clear supernatant was taken and kept in ependroffs. All biochemical tests were carried out as early as possible and done by enzymatic colorimetric method 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.

RESULTS

The mean serum albumin and serum bilirubin levels were significantly (***= $p<0.001$ and ***= $p<0.001$ respectively) lower in tobacco chewer non-smoker subjects than those of healthy control subjects (Table-I).

Table-I: Mean ±SD serum albumin and bilirubin levels in two groups (n=60)

Variables	Group A	Group B
	Range (L-H)	Range (L-H)
Serum	4.5833 ±	3.9167 ±
albumin	0.45264	0.33330***
(gm/dl)	(3.30-5.00)	(3.20-4.60)
Serum	0.5433	0.3533 ±
bilirubin	± .18696	0.13060***
(mg/dl)	(0.30-0.90)	(0.20-0.70)

Group A=Apparently healthy subjects of Non-tobacco chewers non-smokers (Control).
Group B= Apparently healthy subjects of Tobacco chewers non-smokers (Experimental).
n= Number of subjects. L-H = low and high range
***= $p<0.000$.
Normal range of serum albumin level is 3.4-5.0 gm/dl[10].
Normal range of serum bilirubin level is 0.2-1.00 mg/dl[11].

DISCUSSION

In this cross-sectional study serum albumin and bilirubin levels were significantly lower in tobacco chewer non-smoker subjects than those of healthy control subjects which is comparable to other studies.[12,13]

Literature review suggested several mechanisms for these changes of serum albumin and bilirubin levels in tobacco chewer non-smoker subjects. Lower levels of serum albumin in tobacco chewer non-smoker subjects might be due to smokeless tobacco (pan masla tobacco) contains hepatotoxic agent, which causes intoxication of liver that leads to impairment of liver functions. As a result decrease the synthesis of albumin in tobacco chewer non-smoker subjects. Researchers also suggested that long-term usage of smokeless tobacco and tobacco related products are the potential generators of free radicals. The highly reactive radicals and reactive oxygen species can act as initiators of carcinogenesis, cause DNA damage, activate pro-carcinogens and alter the cellular antioxidant defense system. Changing the balance towards an in the pro-oxidants over the capacity of the antioxidants is defined as oxidative stress, which might lead to oxidative damage. Albumin help to reduce oxidative damage by scavenging free radicals and by detoxifying the oxidants.[12] Smokeless tobacco chewer are exposed to higher levels of nicotine and tobacco specific nitrosamine, lower levels of antioxidants etc. Bilirubin might be acts as an antioxidant, which helps to reduce oxidative stress.[13]

Therefore, the lower serum albumin and bilirubin levels in tobacco chewer non-smoker subjects might be due to tobacco chewing for a prolong period of time, which induced sustained rise of blood nicotine level. Increased concentration of nicotine, and free radicals might be cause of impaired liver functions in tobacco chewers.

CONCLUSION

The decreased serum albumin and serum bilirubin levels in tobacco chewer non-smoker subjects were evidence of development of liver function impairment due to tobacco chewing and this might offer a new approach to liver function impairment prevention in tobacco chewing population. But from this study the exact mechanism of lower serum albumin and bilirubin in this group of people could not be demonstrated. Estimation of serum nicotine level, in same study population with large sample size may help us to elucidate the mechanism of decrease serum albumin and bilirubin levels due to tobacco chewing.

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Original Article

Sacralization of Lumbar Vertebra in Dry Adult Human Sacrum

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ABSTRACT

CONTEXT: *The sacrum is a large, trilateral bone located at base of the vertebral column serving to transfer the body weight from the trunk to the pelvis and lower extremities. Its base articulates with the last lumber vertebra and there is an anatomical variant that may be unilateral or bilateral producing partial or complete sacralization resulting from sacralization of lumbar vertebra at cranial end.This unusual gross variation encourages the interest of anatomists and causes concern for clinicians.* ***OBJECTIVES:*** *This study was aimed to improve the knowledge about anatomical variation of sacralization of lumbar vertebra.* ***METHODS:*** *The descriptive observational study was conducted in the Department of Anatomy, Sylhet MAG Osmani Medical College, Sylhet over a periodof July 2017 to June 2018.* ***RESULTS:*** *Out of 60 sacra, 57 (95.0%) showed in normal sacra, 3 sacra (5.0%) showed sacralization of lumber vertebra where's male 2 (3.33%) & female 1 (1.67%).* ***CONCLUSION:*** *Sacral variation has paramount importance in clinical field such as sacralization of lumbar vertebra may compress the fifth lumber or 1stsacral nerve causing sciatica, back pain and also cause herniation of disc above sacralization. Degenerative spondylolisthesis commonly develops at L4-L5.*

Key word: Sacralization,PLID (ProlapsedLumbar Intervertebral Disc),Sciatica, LSTV (Lumbosacral transitional vertebra), Spondylolisthesis.

INTRODUCTION

Low Back Pain is an increasing problem in the world. Most of the causes of low back pain is PLID. It occurs in sedentary workers, field workers (e. g: cultivators, rickshaw puller, mason, daily labour, etc.), low socioeconomic group who are hardworking people, lifting heavy weights in their daily life. It may be due to traumatic causes such as road traffic accident which is increasing day by day.[1] LSTV is an anatomical variation which also increase the probability of low back pain.[2] Between L5-S1 intervertebral disc may be thin and narrow and on the other hand the anatomical organization of lumber vertebra is like robust structure and it support the upper body,transfer weight to axial to appendicular skeleton and provide mobility in lower region of back. So, any disorientation of structural defect that is accidental or congenitalmay cause of various serious complications oflow back pain, complicated delivery or labor, vertebral deterioration or disc compressions.[3,4,5]

Sacralization is the congenital anomaly in the segmentation of the lumbosacral spine in which

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the transverse process of the fifth lumbar vertebra fuses to the sacrum on one side or both or to ilium or both and represents the transitional state at lumbosacral junction and are susceptible to degenerative changes resulting from the altered load bearing patterns.[6]

Some author says, due to sacralization of lumbar vertebra there could be difficulty in numbering the vertebral level corresponding to an emerging nerve root at the time of spinal block and on that time if lumbar sacralization is suspected, radiological examination is necessary before lumber epidural injection or selective nerve root block. There may be herniation of disc above sacralization, associated with back pain and fifth lumber or 1stsacral nerve may be compressed leading to sciatica.[7,8]

And on the other hand, the measurement of the distance between the sacral promontory and the inner pubic arch of pubic symphysis is important for the estimation of the obstetrical conjugate, which should be at least 11cm. Obstetricians may use the method of palpation, of the sacral promontory, which also means that the accuracy of the obstetrical-conjugate measurement can be influenced by morphological variations of the sacrum, and specially of LSTV variations.[9]

So, the obstetrical outcome of sacralized fifth lumber vertebra angle of inclination increases, there is delay in engagement of head of fetus as uterine axis does not coincide with that of inlet of pelvis. It favors occipito-posterior position of fetal head which is not common position encountered in normal delivery and may lead to difficult labor. There is difficulty in descent of head of fetus due to long birth canal.[10]

In forensic identification procedures, anatomical variations and congenital sacrum abnormalities used for human identification purposes. The discovery of a LSTV during medicolegal examination of skeletal remains facilitated the forensic identification of the deceased.[11] So, the aim of this study is to know the anatomical knowledge of sacralization of lumbar vertebra which may implementation in clinical aspect.

MATERIALS AND METHODS

This study was performed on 60 dried completely ossified, grossly normal adult sacra of unknown sexes fulfilling the inclusion criteria from the stocks of Anatomy laboratory of Sylhet MAG Osmani Medical College, Sylhet from July 2017 to June 2018. Sex determination of the collected unknown sacra was done by using discriminant function analysis and found 30 (50.0%) male and 30 (50.0%) female. Ethical clearance was taken from the Ethical Board of Sylhet MAG Osmani Medical College, Sylhet.Here,sacralization of lumbar vertebra was regarded as sacrum showed five pairs of foramina and six vertebral segments (Fig: 2,3).

RESULTS

Sacralization of lumbar vertebra was found in 5.0% of cases irrespective of sex (Table-I). It was observed that presence of sacralization of lumbar vertebrais more in case of male (02 out of 30) than female (01 out of 30) (Fig:1).

Table-I: Showing frequency distribution of sacralization of lumbar vertebra

Sacra	Male (n)	%	Female (n)	%	Total, n (%)
Normal sacra	28	46.67%	29	48.33%	57 (95.0%)
Sacralization of lumbar vertebra	2	3.33%	01	1.67%	03 (5.0%)
Total (n)	30	50.00%	30	50.00%	60 (100%)

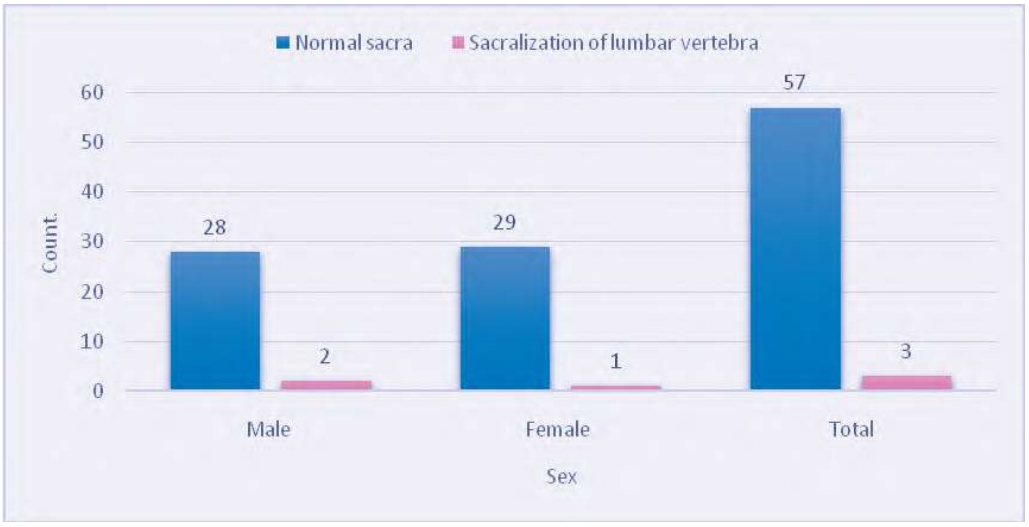

Fig-1: Bar diagram showing sacralization of lumbar vertebra in case of male and female.

Fig-2: Photograph showing sacralization of lumbar vertebra from ventral surface of sacrum.

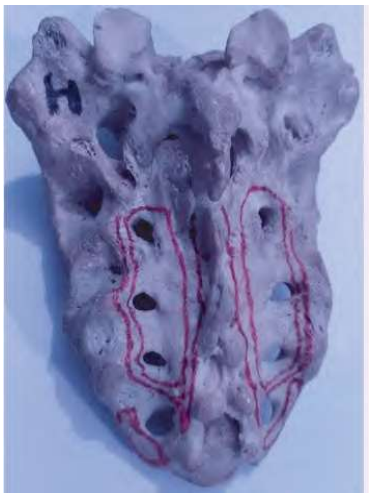

Fig-3: Photograph showing sacralization of lumbar vertebra from dorsal surface of sacrum.

DISCUSSION

In the present study 60 (Sixty) dried completely ossified adult human sacra of both sexes (30 male and 30 female) were included. It shows that the frequency of developing sacralization of lumbar vertebra (3, 5%) is more in male 3.33% in comparison to female 1.67%. The incidence of lumbar sacralization was similar to the study done by others.[12,13,14]

Vertebral malformations in lumber region like fused vertebrae, split vertebrae and ossified fusion between vertebrae and neural arches occur due to in transgenic mice deficient for one functional copy of Pax 1, mutation in Pax 9 which may lead to fifth lumbar vertebra may get sacralized[15]. On the other hand, Hox 10, Hox 11 triple mutants both severely affect sacral formation and this result in complete loss of lumbar vertebra, but the total number of vertebral elements are not altered.[16] These genes are among the major players in the specification of morphological identity of the vertebra[17].So, probably mutation in this gene could lead to lumber sacralization. The embryological development and osteological defects are linked to the occurrence of lumbosacral transitions. Embryologically, the vertebra receives contribution from caudal half of one sclerotome and from the cranial half of succeeding sclerotome.[18] The improper formation and union of somites can cause vertebral abnormalities, including block vertebrae, cleft vertebra, and unilateral or bilateral hemivertebrae.[19] And the complications of sacralization of lumbar vertebra which causes pain and that is well explained by Bertollity,1917 and the complications are actual pressure on nerves or nerve trunks, ligamentous strain, compression of soft tissue between bony joints, by an actual arthritis if a joint is present

and by a bursitis if a bursa is present.On the other hand, incorrect numbering can theoretically lead to problems with the administration of epidural or intradural anesthetics in patients with lumbosacral transitional vertebra. Failure to recognize and to number lumbosacral transitional vertebra during spinal surgery may have serious consequences. LSTV may produce low back pain due to arthritic changes which occur at the site of articulation. So, LSTV patients often present various secondary pathological conditions of the spine due to the mechanical alterations of the area, such as spinal canal or foraminal stenosis, intervertebral disc herniation and facet joint degeneration and arthrosis.[20] So, all of this basis the presence of LSTV is supposed to be associated with an increased the probability for a patient to develop low back pain.

CONCLUSION

Clinical awareness of known and newly discovered anatomical variations is the key to successful result in the clinical setting. LSTV is an important anatomical variation of sacrum. So, in depth knowledge of sacral variations is vital to avoid complications in surgery, anesthetics and obstetrics as well as in forensic identification procedures. This is why the normal anatomical organization, embryological development, about factors that can lead to developmental variation, about ossification process, as well as knowledge about intervertebral disc is very necessary to understand about sacralization of lumber vertebra.

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Original article

Study of Variation in the Shape of Calcaneal Articular Facets in Human Talus

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ABSTRACT

CONTEXT: *Talus is the second largest bone of tarsals. It is responsible for receiving the whole body weight. Inferior surface of talus takes part in the formation of various articulations in the form of talocalcaneonavicular, talocalcaneal or subtalar joints. The most important movement of subtalar joint is inversion and eversion. So anatomic features need to be precisely evaluated and correlated with biomechanical and physiologic data to develop more effective treatments for disability involving subtalar complex. Consequently analysis of articular surfaces of these joints provide vital information in understanding the dynamics of foot, especially following the postoperative fixation and artificial joint production.* ***OBJECTIVES:*** *To determine the patternS of calcaneal articular facets of fully ossified dry human left talus.* ***MATERIALS AND METHODS:*** *One hundred and fifty (150) fully ossified dry human left talus were observed for variations in the shape of calcaneal articular facetsin the Department of Anatomy, Dhaka Medical College, Dhaka from January, 2018 to December, 2018.* ***RESULTS:*** *In total one hundred and fifty study samples, type I was found in 3 cases (2.0%), type II(A) in 50 cases (33.3%), type II(B) in 50 cases (33.3%), type III in 16 cases (10.7%), type IV in 29 cases (19.3%) and type V in 2 cases (1.3%).* ***CONCLUSION:*** *The findings of the present study revealed that most common articular facets were Type II(A&B).*

Key word: Calcaneal articular facets.

INTRODUCTION

Talus is the second largest bone of tarsals and is the key bone of the medial longitudinal arch of the foot[1]. The talus has a body, a neck and a head. The plantar surface of the head has three articular areas separated by smooth ridges.[2] Three articular facets on talus makes joint more stable and less mobile.[3] The articulation betweenthe talus and the calcaneum is by posterior and anterior compartments and is separated by the sinus tarsi and canalis tarsi. The posterior compartment, often referred to as the subtalar joint comprises of the posterior facet of the calcaneum and talus, while the anterior compartment corresponds to the talocalcaneonavicular joint.[4] The plantar surface articulates with the middle one third of the dorsal calcaneal surface by an oval concave facet. The subtalar joint proper involves the concave posterior calcaneal facet on the posterior part of the inferior surface of the talus and the convex posterior facet on the superior surface of the calcaneus and is a modified multiaxial joint.

Talocalcaneonavicular joint is a complex joint as comprising of two articulations, the anterior part of the 'subtalar' joint and the talonavicular joint. The ovoid talar head is continuous with

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the triple-faced anterior area on its inferior surface. The whole fits the concavity and its formed collectively by the posterior surface of the navicular, the middle and anterior talar facets of the calcaneus and the superior fibrocartilaginous surface of the plantar calcaneonavicular (spring) ligament[2]. The subtalar joint is vital to movement as it helps to readjust the lateral (side-to-side) position when to navigate uneven or shifting terrain and to absorb shockfoot.[5] Without the subtalar joint, a person is unable to run, jump, walk or move with any precisio.[5] With regards to the subtalar joint, the talocalcaneonavicular joint helps gliding and rotatory movements which are involved with the inversion and eversion of the foot.[6]

Talar facets can be helpful in diseased foot for reconstruction and rehabilitation procedures[7]. Analysis of the articular surfaces of the subtalar joint provide vital information in understanding the dynamics of the foot, especially following as postoperative fixation and artificial joint production.[4]

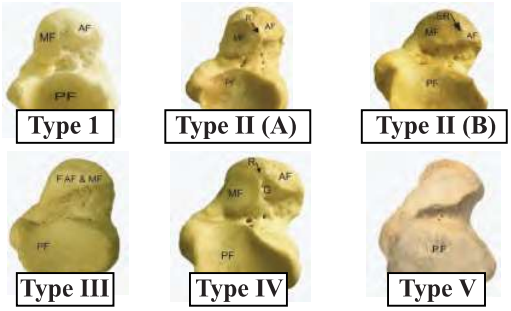
METHODS

One hundred and fifty (150) fully ossified dry human left talus were collected from the medical students of Dhaka Medical College, Dhaka and Northern International Medical College, Dhaka. Broken or incomplete bones, congenitally deformed bones were excluded from the study. Types of calcaneal articular facets classified and each talus was carefully observed and numbered for various patterns of articulating facets for calcaneus on plantar surface of talus following Phunchago, et al.[8]

Six types were classified-

type I - three facets are separated.
type II(A) - the anterior and middle facets are partially connected with predominant ridge.
type II (B) - the anterior and middle facets are partially connected with slight ridge.
type III - the anterior and middle facets are fully fused to form a single facet.
type IV - the anterior and middle facets are partially separated by a ridge and partly by a groove.

Different types of calcaneal articular facets on left talus



Photograph 1: showing different types of calcaneal articular facets on talus. AF- represents anterior facet, MF- represents middle facet, PF- represents posterior facet, FAF & MF- fused anterior and middle facet, R- represents rige, G -represents groove.

Ethical clearance: The study was approved by the Ethical Review Committee of Dhaka Medical College, Dhaka.

RESULTS

The results are shown in figure 1

Table I: Types of calcaneal articular facet on talus

Type of calcaneal articular Facets	Frequency	Percentage (%)
Type I	3	2.0
Type II (A)	50	33.3
Type II (B)	50	33.3
Type III	16	10.7
Type IV	29	19.3
Type V	2	1.3
Total	150	100.0

Figures in parentheses indicate percentage

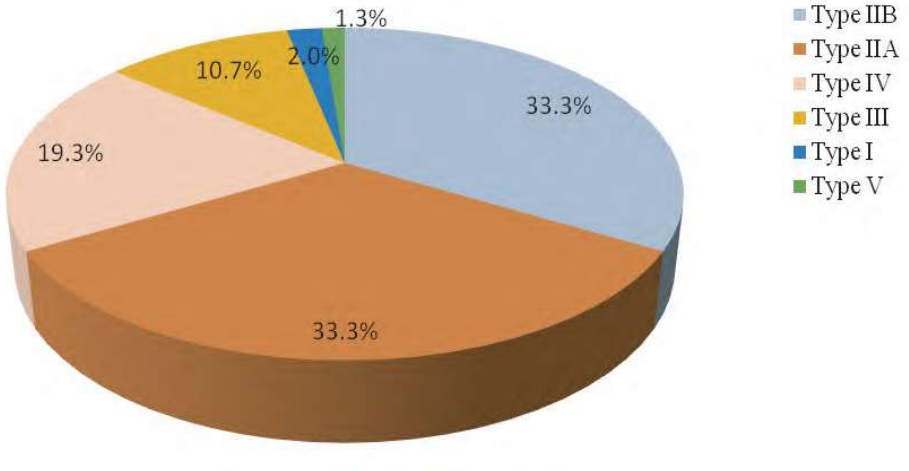


Fig.1 Pie chart showing percentage of types of different calcaneal articular facets on talus

DISCUSSION

There are variations in the shape of the articular facets. Various reasons for variations of articular facets on talus may be due to different races, types of gait, built of an individual, living in plain surface/hilly areas. Some variations could be because of impact on position of axis of movement between talus and calcaneum resulting in different positions relative to load and force .[3]

In the present study, out of 150 left talus type II(A&B) articular facets were commonly observed Phunchago et al.[8], carried out a study on Thai population.They observed type II (A) articular facet was the most common which was consistent with the findings of the present study.

Researchers like Garg, et al.[1] who worked on Frech population, Azra, et al.[3] who worked on Indian people and Bilodi and Agrawal,[9] who worked on Nepalese population found type II (A) articular facets were the most common in their studies. Type II (A) articular facets of calcaneus on talus coincide with the findings of the present study.

CONCLUSION

Type II (A&B) articular facets were common in Bangladeshi population.

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Original article

Pattern of Dermatological Disorders among Patients Attending OPD of Dermatology: A Tertiary Care Hospital Record Based Cross-sectional Study

Md. Shamim Ahmed[1], Md. Mohasin Abdullah Khan[2], Mohd. Asaduzzaman Babu[3], Talha Bin Yousuf[4], Krishna Chandra Das[5], Md. Shafiqul Islam[6]

ABSTRACT

BACKGROUND: *Pattern of skin diseases varies from country to country and different region of the same country. Now a day's magnitude of dermatological disorders is rising.* ***OBJECTIVE:*** *This study was aimed to determine the pattern of dermatological disorders among the patients attending OPD of dermatology, North Bengal medical college hospital, sirajganj, Bangladesh.* ***METHODS:*** *This retrospective cross-sectional descriptive study was conducted in the department of Pharmacology and Therapeutics with the help of hospital patient's record data during 1st October, 2019 to 30th March, 2020. On the basis of selection criteria total number of 634 patients was enrolled in this study. Diagnosis of dermatological disorders was done by qualified dermatologists. Statistical analyses (percentage calculation) and graph generation were done using Microsoft Excel software.* ***RESULTS:*** *Out of 634 patients females were 361 (57%) and males were 273 (43%). Majority was Muslims (615, 97%) and remain with the age group of 19-40 years. Most common dermatological disorders were fungal infection (131, 20.66%), dermatitis (124, 19.56%) and acne vulgaris (106, 16.72%). Rest of the patients suffering from urticaria (56, 8.83%), scabies (51, 8.05%), prurigo nodularis (44, 6.95%), psoriasis (19, 2.99%), alopecia (16, 2.53%) and Melasma (12, 1.9%).* ***CONCLUSION:*** *Fungal infection was the most common skin disease. Female, children & young adults were the common victims. Health service providers would be able to prevent, control & thus reduce the skin disease in the light of present study.*

Key word: Dermatology, Skin diseases, Dermatitis

INTRODUCTION

Dermatology is a rapidly growing branch of medical science that deals with diagnosis and treatment of skin, hair and nail related disorders. Skin is the largest and most visible organ of the human body which acts as first line defense against injury. Various factors are injurious to skin such as extrinsic factors like environmental, chemical, infectious agents as well as intrinsic factors like metabolic, genetic and immunological etc.[1] Now days a large number of dermatological disorders are emerging. Almost all individuals at one or the other point in their lifetime encounters skin diseases either minute or serious one. Dermatological disorders act as a mirror of various internal diseases because they are identified by dermatological manifestations.[2,3]

Globally, skin diseases are common and major contributors of disease burden in society. Neonates to elderly all individual can affect by various skin diseases. There are more than 2000 different types and presentations of skin diseases.[4] Skin disorders have serious harmful effect on quality of life in general population. Most of the skin diseases are chronic and require long duration of treatment, so physical, social, psychological as well as financial sufferings are common.[5] Moreover, severe skin

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related symptoms on the face and body can deteriorate self?esteem and self-confidence of patients, which significantly affect their involvement in social activities.[6,7] Skin diseases are 18th leading cause of health burden in the world[8]. and ranking the fourth among causes of non-fatal morbidity[9]. Dermatological disorders constitute 2% of total Out Patient Department (OPD) consultations worldwide[10]. The global burden of disease project reported that, dermatological disorders were estimated to cause 41.6 million disability-adjusted life years, which is equivalent to 1.79% of the total burden of diseases. Among the skin diseases, dermatitis accounts for the highest burden.[11]

Sometimes less common health problem draw the attention of public health strategy in developing countries rather than high frequency of some skin diseases.[12-14] From country to country and different region of the same country, pattern of skin diseases may differ. Many factors like religion, occupation, nutrition, habits, genetic change, and race may influence the types of dermatological disorders. Season and climate changes influence the different types of skin disease in particular region. In our country there is wide variation in climate and socioeconomic status. Low hygiene, overcrowding, poor access to water and high interpersonal contact are responsible for certain skin diseases.[15-18]

Considering the above factors and lack of adequate knowledge about the pattern of skin diseases in northern region of Bangladesh, this study was conducted to find out the actual picture of skin disorders among the patients attending the OPD of Dermatology and Venereologyof North Bengal Medical College Hospital, Sirajganj, Bangladesh.

METHODS

This retrospective cross-sectional descriptive study was carried out in the department of Pharmacology and Therapeutics with the help of hospital patient's record data. On the basis of selection criteria total number of 634 patients were enrolled in this study out of 1089 patients with dermatological disorders attending OPD of Dermatology and Venereology, North Bengal Medical College Hospital, Sirajganj, Bangladesh, during 1st October, 2019 to 30th March, 2020. Diagnosis of dermatological disorders was done by qualified dermatologists. Patients suffering with comorbidity diseases e.g. Diabetes Mellitus, Hypertension etc., and patients in whom the diagnosis was difficult were excluded from this study. Informed written permission was taken from hospital authority. Statistical analyses (percentage calculation) and graph generation were done using Microsoft Excel software.

RESULTS

A total of 1089 dermatological patients were treated in the OPD of North Bengal Medical College. Among them 634 patients were included in the study as per selection criteria.
Among the study subjects (n-634) majority 361 (57%) of the patients were female (Figure 1).
Male and female ratio was 0.75:1.

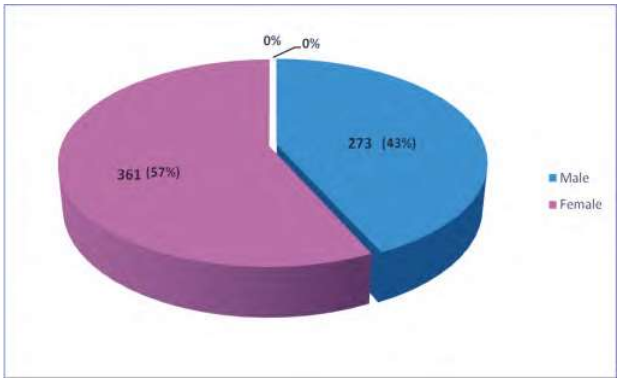

Figure 1: Sex distribution of study subjects

Maximum 615 (97%) patients were belong to Islam by their religion (Figure 2).

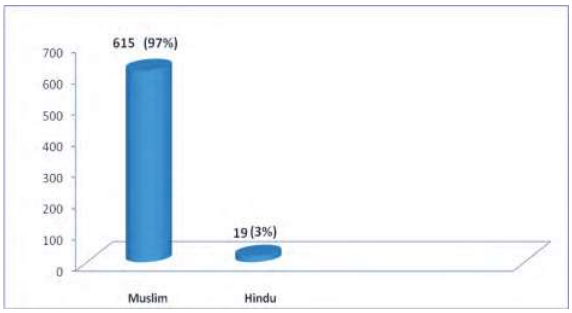

Figure 2: Distribution of religions among the study population.

Age range and mean age were 2 months to 85 years and 34.56 years respectively. Maximum patients having dermatological disorders were within the age range of 19-40 years (Table I).

Table I: Age distribution of study subjects (n-634)

Age groups (in years)	Frequency n (%)
<1 (Infant)	19 (2.99)
1-18 (Children)	238 (37.54)
19-40 (Yung adult)	282 (44.48)
41-60 (Adult)	78 (12.30)
>60 (Geriatrics/Old)	17 (2.68)
Total	634 (100)

Table II: Pattern of dermatological disorders

Name of skin disease	Frequency n (%)
Fungal infection	131 (20.66)
Dermatitis	124 (19.56)
Acne vulgaris	106 (16.72)
Urticaria	56 (8.83)
Scabies	51 (8.05)
Prurigo nodularis	44 (6.95)
Psoriasis	19 (2.99)
Skin and soft tissue infection	19 (2.99)
Alopecia	16 (2.53)
Melasma	12 (1.9)
Others/Miscellaneous	56 (8.83)
Total	**634 (100)**

Highest number of patients in this study suffered from fungal infection. One hundred thirty one (20.66%) patients were treated with antifungal medications. Second, third and fourth most common skin disease were dermatitis 124 (19.56%), acne 106 (16.72%) and urticaria 56 (8.83%) respectively. Incidences of scabies, prurigo nodularis, psoriasis, alopecia, melasma are mentioned in the Table: II. A total of fifty six (8.83%) patients suffered from very less common diseases like vitiligo, miliaria, nevus, drug reaction, icthyosis, keratosis pilaris, keratoderma, viral warts, angular stomatitis, aphthous ulcer, lichen planus, lichen simplex chronicus, hand foot and mouth disease etc.

DISCUSSION

Pattern of skin diseases vary from country to country, even it varies from region to region in the same country. Skin diseases depend on different ecological, socio-economic, religious and environmental factors. This study presents the report of 634 patients from dermatology outpatients department (OPD) of North Bengal Medical College Hospital (NBMCH), sirajganj, Bangladesh.

In our study, out of 634 patients, 361 (57%) were female and 273 (43%) were male. It indicates that prevalence of skin diseases may be more in female than male. Higher incidences of skin disease in female was also 239 (62%) reported in a study done in Rajshahi medical college hospital, Bangladesh by Afroz et. Al.[19] Our finding is also in aggrement with other studies.[18,20,21] It may be due to high sensitivity of females to health-related issues or over consciousness about their body image at a younger age.

In terms of religion, this study found that most of the patients (615, 97%) were Muslim. Bangladesh is a Muslim majority country and it is not a matter of being surprised that most of the skin diseases are occurring in Muslim families.

In was found that more than 80% of OPD patient were the children and young adult age group. Prevalence of skin disease is more in second, third and fourth decades of life may be due to lack of personal hygiene, health education, health awareness, health care facilities and overcrowding as well as occupational variation etc. Our study findings are very much consistent with the findings of Afroz et. al[19] and Khan et. al.[22] These two studies were conducted in Rajshahi Medical College Hospital and BIRDEM general Hospital, Dhaka, Bangladesh respectively. In Singapore[23] more patients were in age group 20 to 39 years; in India[2] it was more in third and fourth decade; however, in Egypt[24] it was more on second decade.

This present study revealed that the most common 131 (20.66%) skin disorder was superficial fungal infection. The warm and highly humid climate of the country, lack of maintenance of personal hygiene, malnutrition, lack of immunity may account for the high incidence of fungal infections. This finding is supported by other studies[22,25] conducted in BIRDEM general hospital and Faridpur Medical college hospital of Bangladesh. They found prevalence of fungal infection 17.26% (2699) and 28.3% (1570) respectively. Other similar studies reported same result in India[1] (2200, 19.57%) and Pakistan[26] (7023, 34.8%).

Dermatitis was the second largest (124, 19.56%) group of skin disorder in our study. Afroz et. al[19] and Sarkar et. al[25] reported almost similar finding (83, 21.6% and 3000, 19.2%) of Rajshahi medical college hospital and Faridpur medical college hospital respectively. Among dermatitis, atopic dermatitis was common in children and contact dermatitis was common in adult population.This findings was in accordance with other studies.[1,22,26] Contact dermatitis was common due occupational variation in this region. Most of the adult populations are related to work with dye.

The third most common skin disease in this study was acne vulgaris (106, 16.72%). Most of the patients were female. Excessive use of cosmetics, steroid preparation, emotional stress etc. may be the key factors for this disease. Several other studies mentioned similar observation.[22,27]

We reported prevalence of urticaria 8.83% (n-56). Almost similar finding was reported bySharma et. al,[1] Sarkar et. al[25] and Nguyen et. al.[28] Whereas less prevalence reported by other studies.[19,26,27] Scabies was less prevalent in this study where as high prevalent in several other similar studies.[1,19,25,27] Actual reason of less prevalence of scabies in northern region could not be identified clearly. Prurigo nodularis is an uncommon chronic skin disorder. We prevalent 6.95% (44) patients suffering from this problem. It may be due to most of the patients gave history of chronic pruritus.

This Study was a single-center study. So, the results may not reflect the scenarios of the whole country. Hence more studies in this field are required which can give deeper insight on actual causes of different skin diseases and their extent of effect on the quality of life.

CONCLUSION

It can be concluded that considering the sex group, females are more commonly affected by dermatological diseases than the males. So females should be provided with more personal health care facilities at family level as well as social perspectives.
Health care providers can procure medicines and logistics in the light of this study.

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Conflict of interest: None.

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Original Article

Comparative Study of Metabolic & Biochemical Status between Type -II Diabetes Mellitus Patients and Nondiabetic Person.

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ABSTRACT

BACKGROUND: *Type 2 diabetes mellitus (T2DM) is a well-known disease in both developing and developed countries. Obesity and dyslipidemia are closely related to T2DM and share a common pathogenesis associated with "insulin resistance".* ***OBJECTIVES:*** *Objectives of this study were(1) To compare the lipid profile, body mass index (BMI) and waist circumference (WC) in type 2 diabetic patients having poor and good metabolic control and with that of a normal control group. (2) To study the correlation between glycosylated hemoglobin (HbA1c) values with serum triglycerides (TG) and high-density lipoprotein (HDL) in patients with Type 2 DM plus normal non-diabetic participants.* ***METHOD:*** *This study was conducted at the medicine out-patients' department of Rangpur Community Medical College& hospital from January 2019 to December 2020. Patients were fasted overnight (8 to 12 hours); fasting blood samples were collected for estimation of lipid profile and HbA1c. Waist circumference was measured in centimeters; body weight in kilogram and height in centimeter. Then BMI was calculated using the formula weight (kg)/height (m2).****RESULTS:*** *Waist circumference and mean BMI values are significantly high in diabetic patients in compared to the non-diabetic control group, it is also significantly higher in diabetic patients who had poor metabolic control in compared to the patients who had good metabolic control. Prevalence of dyslipidaemia is more among the diabetes patient in both poor and good metabolic control groups in compared to the normal control group. A negative correlation between HbA1c and HDL and a positive correlation between HbA1c and Triglycerides was also observed in this study.* ***CONCLUSIONS:*** *Lifestyle &dietary modifications may help to optimize weight and dyslipidaemia in addition to drug treatment in Type 2 DM for overall reduction of cardiovascular events. HbA1c can provide valuable supplementary information about the extent of circulating lipids besides its primary role in monitoring long-term glycemic control.*

Key word: Type 2 Diabetes Mellitus, Dyslipidaemia, Obesity, Body mass index, Waist circumference.

INTRODUCTION

Type 2 diabetes mellitus (T2DM) is a well-known disease in both developing and developed countries. T2DM is the predominant form of diabetes worldwide, accounting for 90% of cases globally.[1] Obesity is a key risk factor for T2DM, cardiovascular disease (CVD), hypertension, respiratory disease, and other chronic noninfectious diseases. It is becoming an important global public health problem that leads to disability, which adversely affects the individual's quality of life and increases their financial burden on the state.[2]

Obesity develops when energy intake exceeds expenditure over a long period, and weight gain and obesity largely result from eating too much and not taking enough exercise. Most obesity develops as a result of modern lifestyles in genetically susceptible individuals. These changes include increased consumption of high-energy food and at the same time physical

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activity levels have declined dramatically, the nefarious edge of a double-edged sword that brings safer, easier lives, and television and computers make a significant contribution. In many societies less affluent people appear to be at greater risk. Around 90%of Western people are predisposed to developing the 'abdominal' phenotype. We put on 0.9 g every day from around ages 25 to 55, which contrasts with 'wild-type' humans, who no longer exist, but whose weight plateaued in adulthood. We are, on average, 15 kg heavier than 100years ago (although a little taller, by approximately 1 cm/decade).[3]

The prevalence of obesity in Bangladesh was not as high as that in developed countries; but in recent years, it has shown an upward trend, and obesity-related metabolic syndrome is now receiving widespread attention. Over the last 33 years, rates of either being overweight or obese doubled among Bangladeshi adults but remained low among children, according to a new, first-of-its-kind analysis of trend data from 188 countries. In 1980, 7% of adults and 3% of children were overweight or obese. In 2013, those rates had climbed to 17% for adults but only 4.5% for children.[4]

'Cocacolarisation' is very evident in communities recently exposed to western lifestyles, asexemplified by Aboriginals where the 'thrifty gene' hypothesis has been postulated - that our ancestors were predisposed to diabetes because those predisposing mechanismsallowed survival during famine, but perhaps in reality, allpeople have this 'thrifty' potential.[3]

Obesity is determined and categorized by calculating body mass index (BMI) and by measuring the waist circumference following WHO criteria. Even though BMI captures the degree of overweight and obesity, it ignores body fat distribution. Visceral fat tissue is metabolically more active than non-visceral fat and secretes more hormones and cytokines, which might be important for the development of diabetes.[6] It is a simple way to assess the levels of visceral fat using the measurement of waistline.[6,7]

It is also reported that most patients with T2DM could have dyslipidemia at varying degrees, characterized by increased levels of triglyceride (TG) and decreased serum high-density lipoprotein cholesterol (HDL-C). When this characteristic lipid profile is seen in T2DM, it is referred to as diabetic dyslipidemia and confers a risk of CVD. Insulin resistance and T2DM are generally accompanied by low levels of HDL-C and high TG8-10. Both obesity and dyslipidemia are closely related to T2DM and share a common pathogenesis associated with "insulin resistance".[11]

The aim of this work is to compare the lipid profile, body mass index (BMI) and waist circumference (WC) in T2DM patients, having poor and good metabolic control and with that of a normal control group at a multidisciplinary hospital setup in Bangladesh. We also aimed to find out the correlation between glycosylated hemoglobin (HbA1c) values with serum triglycerides (TG) and high-density lipoprotein (HDL) in patients with Type 2 DM.

MATERIALS AND METHODS

This descriptive comparative study was conducted for a period of 24 months among the

patients attending to the medicine outpatient department of Rangpur Community Medical College& Hospital from January 2019 to December 2020.Study was conducted among 140 subjects aged from 40 to 60 years. They were divided into three study groups based on their HbA1c values,

1. Group 1: Type II diabetic patients with poor metabolic control (with HbA1c values >6.5).
2. Group 2: Type II diabetic patients with good metabolic control (with HbA1c values <6.5).
3. Group 3: Normal age-matched control.

Inclusion criteria: Newly diagnosed T2DM patients, patients with T2DM who are on treatment and randomly selected age matched normal subjects who are not diabetic.

Exclusion Criteria: Patients with history of smoking, alcohol consumption, acute infections and inflammatory diseases, hepatic or renal disease, coronary heart disease, macrovascular, and microangiopathic complications in diabetes and patients who are taking drugs for lipid abnormality were excluded from the study.

Patients were fasted overnight (8 to 12 hours); fasting blood samples were collected for estimation of lipid profile and HbA1c. Waist circumference was measured in centimeters using a tape kept horizontally midway between lower costal margin and the upper border of iliac crest at right mid-axillary line with the subject standing in gentle expiration. Body weight in kilogram and height in centimeter were measured using standard scales. Then BMI was calculated using the formula weight (kg)/height (m^2).

We used a WHO approved BMI scale for Asian populations: Underweight (<18.5 kg/m^2), Normal weight (18.5 to <23.0 kg/m2), Overweight (23.0 to <27.50 kg/m2), and Obese (?27.50 kg/m^2)[5,6].

Abdominal obesity, which is closely associated with intraabdominal or visceral fat (which can be distinguished from subcutaneous fat by imaging) and measured by waist circumference; for male>102 cm and for female >88 cm (male >90 and female >80 among Bangladeshi people)[5].

Statistical Analysis: Data were analyzed using Statistical Package for the Social Sciences (SPSS) version 16. Results were expressed as mean ± standard deviation. Mean difference between the groups were analyzed using ANOVA (Analysis of Variance) test. To find out whether there is a significant association or not between two variables, coefficient of correlation was calculated. The correlation coefficient used to denote association between two continuously measured variable is the Pearson's correlation coefficient. Correlation coefficient "r" tends to lie between +1.0 and -1.0. If r is near +1, it indicates a strong positive association between X and Y that is when one variable increases the other variable also increases. A value near -1.0 indicates a strong negative association that is when one variable increase and the other variable decreases. Chi-square test was also done to find out significance between two variables. $P < 0.05$ was taken as the level of significance.

RESULTS

Age & Sex of the participants:

Among 140 participants, 79 (56.43%) were male and 61 (43.57%) were female. Participants were divided into three groups

groups according to their diabetes status, the mean age of participants in different groups are given in Table I. Age of participants among the three groups (in case of both male and female) don't show significant differences (p value > 0.05)

Table I: Mean age of participants in different groups

		Number of Participants	Mean age	F-stat	P value
Normal (Non-diabetic)	Male	35	47.65 + 5.84		
Diabetics with good metabolic control	Male	24	48.85 + 6.61	0.99571	0.373992
Diabetics with poor metabolic control	Male	20	50.10 + 6.86		
Normal (Non-diabetic)	Female	29	48.30 + 5.78		
Diabetics with good metabolic control	Female	12	48.30 + 6.62	0.93824	0.3976
Diabetics with poor metabolic control	Female	20	50.75 + 7.20		

Obesity status:

BMI and waist circumferences in three groups of participants are given bellow in **Table II** and **Table III.**

Significantly higher mean BMI value was observed among the diabetic patients in compared to normal control group AND significantly higher mean BMI value was also observed among the diabetic patients having poor metabolic control in compared to the patients having good metabolic control in both male (P <0.000018) and female (P< 0 .000232).

Significantly higher mean WC value was observed among the diabetic patients when compared to normal control group AND significantly higher mean WC value was also observed among the diabetic patients having poor metabolic control in compared to the patients having good metabolic control in both male (P =0.0102) and female (P = 0.0341).

Table II: Comparing BMI (means) between three study groups of patients

		Number of Participants	Mean age	F-stat	P value
Normal (Non-diabetic)	Male	35	23.44 +2.21		
Diabetics with good metabolic control	Male	24	25.64 + 2.80	12.57585	**0.000018**
Diabetics with poor metabolic control	Male	20	26.61 + 2.41		
Normal (Non-diabetic)	Female	29	21.03+ 3.22		
Diabetics with good metabolic control	Female	12	23.29 +4.03	9.80979	**0 .000232**
Diabetics with poor metabolic control	Female	20	25.76 + 2.52		

Table III: Comparing Waist circumference (means) between three study groups

		Number of Participants	Mean age	F-stat	P value
Normal (Non-diabetic)	Male	35	86.29 + 5.18		
Diabetics with good metabolic control	Male	24	87.83 + 5.44	4.8586	0.0102
Diabetics with poor metabolic control	Male	20	90.80 + 4.97		
Normal (Non-diabetic)	Female	29	78.13 + 4.43		
Diabetics with good metabolic control	Female	12	79.32 + 7.35	3.6001	0.0341
Diabetics with poor metabolic control	Female	20	81.60 + 1.53		

Serum lipids and Diabetes.

Mean values of various serum lipids are given in **Table IV** below.

" In this study, higher mean values of TC, LDL and TG are observed among the diabetic patients (both in poor metabolic control and good metabolic control groups)in compared to the normal control group. Among the diabetic patients; poor metabolic control group had higher value than good metabolic control group. These higher levels are not statistically significant for TC and LDL (p values are 0.59807 and 0.60227) but statistically significant for TG (p value < 0.05).

" The results of this study also showed a lower mean value of HDL in diabetic patients (in both poor metabolic control and good metabolic control groups)in compared to normal control group. Among the diabetic patients, poor metabolic control group had lower value than good metabolic control group. These lower levels are statistically significant for both male and female participants (p values < 0.05).

Table IV: Mean values of serum lipids

	Non diabetic Control	Diabetes with good metabolic control	Diabetes with poor metabolic control	P value
Total cholesterol	172.97 + 43.45	181.58 + 43.42	185.69 + 75.14	**0.59807**
HDL (Male)	51.11 + 6.92	50.19 + 7.52	40.30 + 6.92	**0.0000**
HDL (Female)	43.15 + 6.81	42.40 + 9.26	36.65 + 5.21	**0.0000**
LDL	111.00 + 21.15	112.43 + 22.97	114.95 + 16.39	**0.60227**
Triglyceride	149.36 + 37.32	170.19 + 66.07	292.33 + 69.90	**0.0000**

Table V, shows the distribution of three groups of participants according to their serum lipid levels (normal or high in case of total cholesterol, LDL-Cholesterol and triglycerides and normal or below normal in case of HDL).

It is observed that as the metabolic control became poorer, there is more and more people appear to have high serum triglycerides level; this is statistically significant (X2(2, N = 140) = 12.1781, p = 0.002). In the other hand more and more people shown having low serum HDL level as metabolic control gets poorer; this is also statistically significant, X2(2, N = 140) = 16.5332, p = 0.0003).

Regarding other lipids, more people also appear with increased serum total cholesterol and LDL levels as the metabolic control gets poorer; but this change didn't show statistical significance.

Table V: Distribution of different groups of participants (Normal control, diabetes with better metabolic control and diabetes with poor metabolic control) according to their lipid profile (normal lipid and dyslipidaemia status).

Lipid profiles		Normal (Control)	Diabetics with good metabolic control	Diabetics with poor metabolic control	Chi-square value	P value
Total Cholesterol (Normal < 150 mg/dl)	***Normal***	51	31	29	2.1489	0.341
	Above normal	13	5	11		
	$X^2(2, N = 140) = 2.1489, p = 0.341483$					
LDL (Normal 60-130 mg/dl)	***Normal***	55	31	32	0.7771	0.678
	Above normal	9	5	8		
	$X^2(2, N = 140) = 0.7771, p = 0.678038$					
HDL (Normal Male > 50 mg/dl Female > 40 mg/dl)	***Normal***	43	22	11	16.5332	**0.0003**
	Below normal	21	14	29		
	$X^2(2, N = 140) = 16.5332, p = 0.0003$					
Triglyceride (Normal < 150 mg/dl)	***Normal***	44	25	12	12.1781	**0.002**
	Above normal	20	11	28		
	$X^2(2, N = 140) = 12.1781, p = 0.002$					

The correlation between HbA1C level & HDL-cholesterol and correlation between HbA1C & HDL-cholesterol:

The correlation between levels of HbA1C & HDL-cholesterol and the correlation between levels of HbA1C and triglyceride are shown in scattered diagram 1 and 2.

" Correlation between HbA1C and HDL level: The value of correlation coefficient R is -0.4609. It shows a negative correlation; which means HDL levels decrease with increasing levels of Hb A1c. The P-Value is <.00001; means, this decreasing trend of HDL with increasing HbA1C is statistically significant.

" Correlation between HbA1C and HDL level: The value of correlation coefficient R is -0.4609. It shows a negative correlation; which means HDL levels decrease with increasing levels of Hb A1c. The P-Value is <.00001; means, this decreasing trend of HDL with increasing HbA1C is statistically significant.

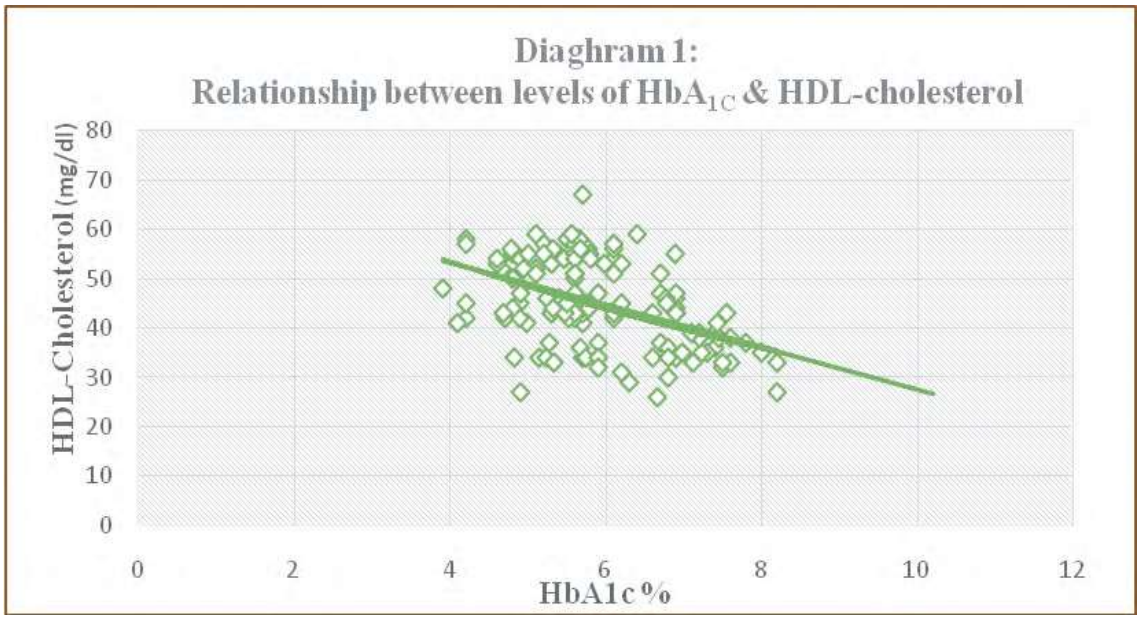

Diagram 1:(r (138) = -0.4609, p < .00001.)

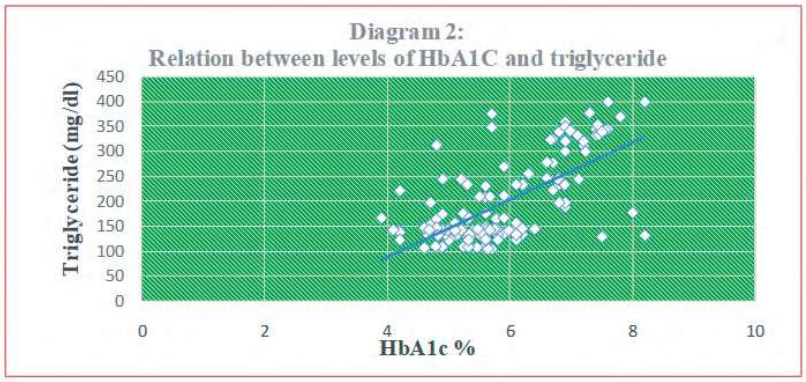

Diagram 2: (r (138) = 0.6552, p = <.00001)

DISCUSSION

In this study, we found a negative correlation between HbA1c and HDL **(Diagram 1)** and a positive correlation between HbA1c and Triglycerides **(Diagram 2)**. These findings are consistent with results obtained by studies done by Khan[12] and Khan et al[13] These findings suggest that HbA1c can provide valuable supplementary information about the extent of circulating lipids besides its primary role in monitoring long-term glycemic control. Increase in TG and decline in HDL with HbA1c rise shows the impact of glycemic control on lipoprotein levels and that dyslipidemia of diabetic patients may be correctable by improving blood sugar.

In this study, the mean BMI of diabetic patients with poor metabolic control and good metabolic control was significantly higher than normal controls (Table II). Mean BMI value of the participants in the control group was within normal BMI value compared to the diabetic patients who were found overweight. These values were also significant when compared between diabetic patients with poor and good metabolic control and with the normal control group.

In this study, there was a significant elevation of mean WC values in both male and female diabetic patients when compared to normal controls. These values were also significant when compared between diabetic patients with good and poor metabolic control (Table III). The risk for diabetes increases if WC values in men are more than 90 cm, and in woman if they are more than 80 cm.[14] In this study, 40% of the males had WC more than 90 cm and 65% of the females had WC more than 80 cm.

Combining both sexes, 50% of the participants had WC above normal. It clearly depicted that half of the participants were overweight and had abdominal adiposity. Freemantle et al. observed that there is a strong association between abdominal obesity and the development of Type 2 diabetes and reduction of WC decreased the risk of developing Type 2 diabetes.[15]

Insulin resistance causing defective glucose utilization and fatty acid mobilization from adipose tissue. These fatty acids are mobilized for energy purpose, and excess fatty acids are accumulated in the liver which are converted into TG.[16] Suryavanshi et al. suggested that insulin resistance is associated with the diminished level of LDL receptor with an increase in LDL particle and the resultant increase in LDL cholesterol[17]. Decline in HDL is due to increased HDL catabolism with augmented TG hepatic lipase activity. TG rich HDL particles are hydrolyzed by hepatic lipase and are rapidly catabolized and cleared from plasma. Low HDL cholesterol is often accompanied by elevated TG levels, and the combination has been strongly associated with an increased risk of coronary heart disease. Increased caloric ntake, obesity, and lack of muscular exercise contributes to dyslipidemia observed in Type 2 DM.[17]

CONCLUSION

Increase in TG and decline in HDL with HbA1c rise, shows the impact of glycemic control on lipoprotein levels and that hyperlipidemia of diabetic patients may be correctable by improving blood sugar. Majority of diabetic

patients were overweight and had abdominal adiposity. High level of cholesterol, TG, LDL cholesterol, and low HDL cholesterol may be due to obesity, increased caloric intake and lack of muscular exercise in patients of DM. Lifestyle modifications such as weight control with reduction in WC, increased Physical exercise along with proper control of hyperglycemia, and hyperlipidemia are effective interventions to ensure a better quality of life, prevent adverse cardiovascular outcomes and to retard the progression of microvascular and macrovascular complications in the long run.

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Original Article

Study on Maintanance of Personal Hygine through Hand Washing among the Children Attending of Government Primary School

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ABSTRACT

BACKGROUND: *The school environments and home are of special concern for the transmission of infectious diseases among young children who are at the greatest risk. Childhood is the best time for children to learn hygiene behaviors. A child has to be healthy to learn and besides home, school is an important place where a child learns to be healthy. Hand washing is one of the best ways to avoid getting sick and spreading illness to others.* ***OBJECTIVE:*** *Objectives of the study was to observe maintanance of personal hygine through hand washing among the children attending at Goverment Primary School.* ***METHODS:*** *This study was a cross-sectional observational study conducted in the department of Microbiology, Sylhet M.A.G Osmani Medical College. Simple random sampling method used to select schools and 100 school children were enrolled in this study. Data were taken after obtaining informed written consent from each participant/ class teacher/ legal guardian. To examine the hypothesis information about hand washing practice were documented by direct interview. The study found that comparison between urban and rural area was insignificant regarding hand washing practice.* ***RESULTS:*** *Out of 100 children, 2 children regularly practiced hand washing with soap before taking Tiffin, 44 children had irregular practice of hand washing with soap before taking Tiffin and 54 children did not practice hand washing with soap before taking Tiffin. Among those 57 children had regular practice of hand washing with soap after using toilet, 42 children had irregular practice of hand washing with soap after using toilet and one child had no practice of hand washing with soap after using toilet.* ***CONCLUSION:*** *This study showed that the proportion of students who practiced proper hand washing in the school was low.*

Key word: Hand Washing, Personal Hygine.

INTRODUCTION

Hygiene has two aspects - personal and environmental. Personal hygiene include bathing, clothing, washing hands after toilet and before eating and any other activity which has potentiality to contaminate hands. Training in personal hygiene should begin at a very early age and must be carried through school age.

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Hand washing before eating and after using toilet.[1]

In developing countries, two main killers of young children are respiratory infection and diarrhoeal diseases and both are in some extent preventable by hand washing. Poor hand washing practice is responsible for Diarrhoeal diseases, Respiratory infections, Helminthic infections, Skin infections and Eye infections.[2]

Hand washing with soap and water is the cheapest and most effective measure of personal hygiene and universally accepted practice for reducing the transmission of potentially pathogenic microorganisms. Hand washing is an effective and cost effective means to reduce respiratory and gastrointestinal

infection (two global paediatric killers) in health care settings as well as in the community.[3]

Infectious diseases are transmitted by various routes, among them the most common and important route is through the hands. Children are always touching things around them in the environment, touching each other and placing their hands in mouth, eyes and noses. Though children remain together in school, play grounds and in any functions, child to child exchange of bodily secretions and surface-particles is very common. Bacteria, viruses, parasites and fungi often travel on hands from one person to another.[4] Many infectious diseases which are commonly spread through hand to hand contact include some respiratory diseases and several gastrointestinal disorders, such as infectious diarrhoea.[5]

The contaminated hands harbor the common pathogenic microorganisms and act as the major means for faecal-oral transmission of diseases and eventually lead to serious infections.[6] As a consequence, school absenteeism is a major problem among school going children and almost 75% of all school absences are due to illness.[7,8] A hand washing intervention study showed significant reduction of illness related absences in primary school children by as much as 26%.[9]

This study was conducted for trained up a child to develop the habit of hand washing before eating, after using toilet and other key times.

METHODS

This cross sectional observational study was carried out in the department of Microbiology, Sylhet M A G Osmani Medical College from January 2015 to December 2015. Study population were students of four government primary schools situated in Sadar Upazilla of Sylhet District, amongst which two schools are located in the City Corporation area (urban) while two are out of City Corporation area (rural). Simple random sampling method used to select schools and enrolled children for this study. A total of 100 school children were included in the study and two hand swabs (right and left) were collected from each student during school hour in weekdays for bacteriological analysis. Data and hand swabs were taken after obtaining informed written consent from each participant/ class teacher/ legal guardian. Prior to the beginning of this study, approval of the research protocol was obtained from the Ethical Review Committee of Sylhet MAG Osmani Medical College, Sylhet.

RESULTS

Table -I shows the distribution of children according to class. Twenty five school children were selected from each of the four primary schools comprising of 5 from each grade.

Table I: Distribution of children by Class (n=100)

Class	Number	Percentage
Class one	20	20%
Class two	20	20%
Class three	20	20%
Class four	20	20%
Class five	20	20%
Total	**100**	**100**

Out of 100 students 50 were from urban area (City Corporation) and 50 were from rural area (out of City Corporation). This Table-II shows distribution of children according to their residence.

Table II: Distribution of children according to their residence (n=100)

Residence	Number	Percentage
Urban	50	50%
Rural	50	50%
Total	**100**	**100%**

Table-III shows out of 100 children, 38 children wash single hand and 62 children wash both hands during hand washing.

Table III: Distribution of children according to hand washing practice (single or both hands)

Hand washing	Number	Percentage
Single	38	38%
Both	62	62%
Total	**100**	**100%**

Table -IV showed that data regarding hand washing practice before meal (p=0.598) or before Tiffin (p=0.127) and after using toilet (p= 0.601), we did not find any significant difference irrespective of the location of school whether urban or rural.

Table IV: Comparison of hand washing practice between school children of urban and rural area.

Variable	Hand Wash Practice	Urban	Rural	'P' value
Hand wash before meal	Regular	18	19	0.598
	Irregular	31	31	
	No	1	0	
Hand wash before Tiffin	Regular	2	0	0.127
	Irregular	18	26	
	No	30	24	
Hand wash after using toilet	Regular	28	29	0.601
	Irregular	21	21	
	No	1	0	

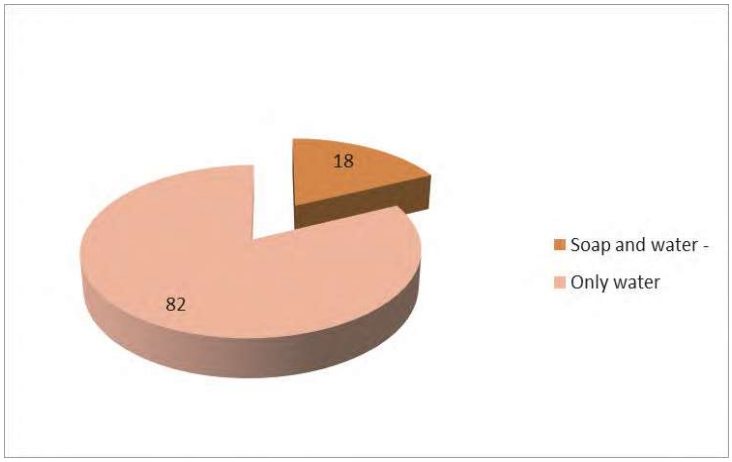

Figure 1: Pie diagram showing distribution of Children based on the materials used for hand washing at school.

Figure 1 shows out of 100 children, 18 children wash their hands with soap and water and remaining 82 children wash their hands with only water at school.

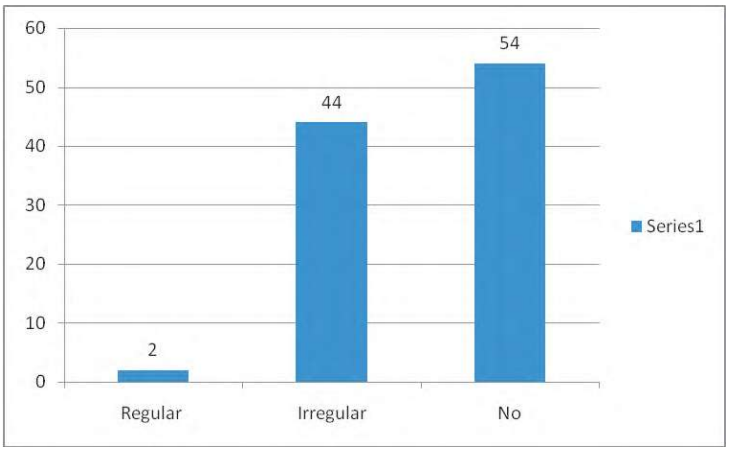

Figure 2: Bar diagram showing distribution of Children according to their hand washing practice with soap before taking tiffin in overall study sample.

Out of 100 children, 2 children regularly practiced hand washing with soap before taking tiffin, 44 children had irregular practice of hand washing with soap before taking tiffin and 54 children did not practice hand washing with soap before taking tiffin (Figure 2)

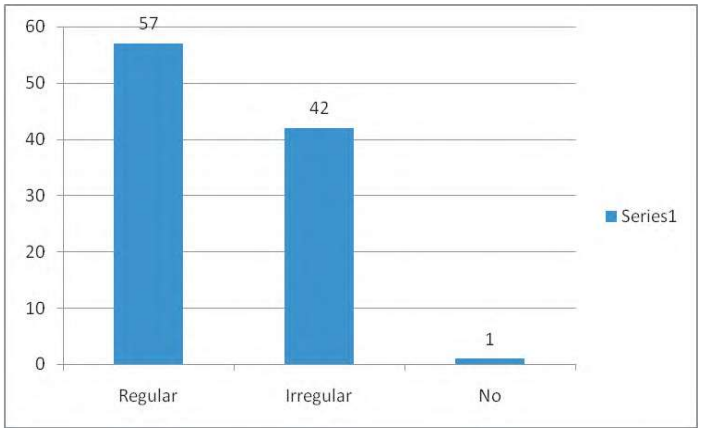

Figure 3: Bar diagram showing distribution of Children according to their hand washing practice with soap after using toilet in overall study sample.

Figure 3 shows out of 100 children, 57 children had regular practice of hand washing with soap after using toilet, 42 children had irregular practice of hand washing with soap after using toilet and one child had no practice of hand washing with soap after using toilet.

DISCUSSION

Hygiene is necessary for the public health mission to reduce the transmission and consequences of infectious diseases. Poor school sanitation and hygiene is a major problem in developing countries and remains high risk behavior among primary school children. In the present study a total 100 students from urban and rural vicinity were taken as study samples for data source. Fifty students were included from two government primary school situated in the Sylhet City Corporation area. The other 50 students were taken from a rural school situated outside the City Corporation area of Sadar Upazilla of Sylhet District. Twenty five students were selected randomly from each school comprising five students from each grade (class I to class V) and the age of the school children were between 6 and 12 years. In their study carried out in Ghana, Steiner-Asiedu et al. (2011) included the school children who were between 6 and 14 years of age.[10] Vivas et al. (2010) in their study included the participants of grades I to VI at Angolela Primary School, located in rural Ethiopia.[11]

This study had an important focus on comparison of hand wash practice in between school students of urban and rural vicinity. The meaning of regular and irregular hand washing practice and structured questionnaire were put to them explained and their spontaneous answers were documented. Data collected regarding hand washing practice before meal (p=0.598) or before tiffin (p=0.127) and after using toilet (p=0.601), here was no significant difference irrespective of the location of school whether urban or rural. But Admasie (2018) found that students living in urban area were 18.84 times more likely to practice proper hand washing compared to students residing in rural area.[12]

In this study among 100 children only 18 children wash their hands with soap and water remaining 82 children wash their hands with only water at school. So current study revealed that soap was not available for use by the students. Usually the soap was kept in teachers' common room and the school children had to seek permission for using the soap. Manandhar (2017) in Kathmandu found only 8.5% students washed their hand in school with soap and water.[13]

In the context of hand washing with soap before taking tiffin, among 100 children, two children had regular practice, 44 children had irregular practice and 54 children did not practice. Xuan and Hoat, (2013) observed such practice both at school and home. The fact revealed in their study that almost all students cleaned the playground with their hands for playing certain games (exposure to dirt/ soil) but did not wash hands after these activities.[14]

Hand washing practice after using toilet or defecation were very important aspect of daily life hygiene practice. In this study there were 57 children who had regular practice of hand washing with soap after using toilet, 42 children had irregular practice and one child was found giving statement of no practice of hand washing with soap after using toilet. A study done in Columbia by Lopez QC showed 33.6% of the students always wash their hands with clean water and soap before eating and after toilet[15]. A study done by Gawai P et al from Mumbai, India mentioned that 18.1% students washed hands after using toilet.[16]

Training in personal hygiene should begin at a very early age and must be carried through school age. The child should be trained to develop the habit of hand washing before eating, after using toilet and other key times.

CONCLUSION

This study showed that the proportion of students who practiced proper hand washing in the school was low. Schools have an encouraging learning environment for children which can stimulate or initiate change. Childhood is the best time for children to learn hygiene behaviors'. Proper hand hygiene is the simplest, most effective and least expensive means of reducing infectious diseases in the community and hospital acquired infection (HAI) in hospital as well. Some students did hand wash by water only or some did not wash hand at all due to unavailability of hand washing material. However, proper environment should be created at early life in school as well as home for practicing hand washing before food and after defecation. The habit which develop at early age, may last for entire life and thus children may be the 'agent of change' in the society.

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Original Article

Facemask Usage and Its Adverse Events Among Healthcare Professionals During COVID - 19 Pandemic

Md. Mahfuzer Rahman[1], ASM Shafiujjaman [2], NilufaYesmin[3], Akter Banu[4]

ABSTRACT

BACKGROUND: *In March 2020, Bangladesh encountered its first official case of COVID-19 (Coronavirus disease 2019). This novel coronavirus, referred to as SARS-COV2, originated in Wuhan, China in December 2019. Within a short amount of time, hundreds to thousands of cases were diagnosed around the World, causing the World Health Organization to announce it as an official infectious disease pandemic on January 30, 2020. COVID-19 is spread by respiratory droplets, and healthcare professionals are mandated to wear PPE when caring for COVID-19 patients. Long term use of face mask may be necessary, but compliance may be low, and physiologic effects have not been well evaluated. The purpose of this study is to determine the physiologic and subjective effects of prolonged use of mask experience by healthcare professionals.* ***METHODS:*** *Forty web based questions were distributed electronically to healthcare professionals who were working in different health centers. Total 417 health service providers participated in this study. This study was cross sectional analytical and was done from 01'August,2020 to 30'September,2020 in Rangpur Medical College and Hospital. All data generated were statistically analyzed using the computer based SPSS in 23.0 version of windows.* ***RESULTS:*** *Age of total 417 respondents ranged from 18 years to 58 years years, 46% were in 30 - 40 years of age, male were 75% & female were 25%. Among healthcare professionals doctor were 88%, nurse were 5%, ward boy were 5% and others were 2%. All respondents had experienced some sorts of adverse events due to wearing face mask. Among the adverse events headache in 50%, pain behind ear in 81%, acne in 15%, extra wrinkles in 55%, rash in 13%, runny nose/ sneezing in 26%, nasal blockage in 24%, sore throat in 14%, cloudiness in goggles in 64%, exertional dyspnea in 66%, palpitation in 20%, tiredness in 67%, reduce memory in 12% and foul smell in oral cavity in 34% of the participant.07% health service providers became rt PCR positive for COVID19 in spite of wearing face mask.* ***CONCLUSION:*** *TAll respondents had experienced some adverse events due to wearing face mask.*

Key word: Facemask, Healthcare professionals, Adverse events, COVID - 19 pandemic

INTRODUCTION

In March 2020, Bangladesh encountered its first official case of COVID-19 (Coronavirus disease 2019). This novel coronavirus, referred to as SARS-COV2, originated in Wuhan, China in December 2019. Within a short amount of time, hundreds to thousands of cases were diagnosed around the World, causing the World Health Organization to announce it as an official infectious disease pandemic on January 30, 2020. COVID-19 is spread by respiratory droplets, and healthcare professionals are mandated to wear PPE when caring for COVID-19 patients. PPE includes gowns, gloves, masks, and face shields.[1] Following the outbreak of the SARS-COV2 pandemic, use of face mask is widely recommended by international, national and local authorities. The aim of the regulations is to reduce the respiratory droplet excretion in pre-symptomatic and asymptomatic individuals.[2] The evidence for face masks to reduce respiratory virus infections or to improve clinical outcomes is heterogeneous.[3,4] However, as long as no effective treatment or

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vaccination against SARS-COV2 is available, health policies need to rely on non pharmacological interventions such as social distancing, intensified hand hygiene and the wearing of face masks.[2] Current recommendations to wear a face mask during times of contact to other individuals affect millions of persons. Especially healthcare professionals are required to wear masks for long periods of time.[2] Disposable surgical masks are intended to reduce transmissions from the wearer to the patient, hand to face contact and facial contact with large droplets. FFP2/N95 face piece respirators meet filtration requirements of small airborne particles, fit tightly to the wearer's face and have been suggested to be more efficacious than surgical masks in reducing exposure to viral infections.[5] They are, therefore, widely used by health care professionals for self-protection, especially during the SARS-COV2 pandemic. However, randomized trials did not find significant differences between FFP2/N95 and surgical masks in preventing influenza infections or respiratory illness.[6,7] The last incidence of prolonged use of PPE among healthcare professionals was during the SARS outbreak in 2003-2004 which originated in Guangdong, China. Studies focusing on effects of prolonged use of PPE during the SARS outbreak were published in subsequent years. A study by Lim, et al. focused on headaches related to mask use8, and another study by Foo, et al. discussed adverse skin reactions such as rashes, acne, and itching from mask use.[9] Wearing masks for a prolonged amount of time causes a host of physiologic and psychologic burdens and can decrease work efficiency. Activity cannot be performed as long or as efficiently while wearing masks as compared to when masks are not worn.[10] Prolonged use of N95 and surgical masks cause physical adverse effects such as headaches, difficulty breathing, acne, skin breakdown, rashes, and impaired cognition. It also interferes with vision, communication, and thermal equilibrium.Headaches related to prolonged mask use can be attributed to mechanical factors, hypercapnia, and hypoxemia. Tight straps and pressure on superficial facial and cervical nerves are mechanical features causing headaches. Cervical neck strain from donning PPE, sleep deprivation, irregular meal times, and emotional stress are other sources of headaches among healthcare professionals during prolonged mask use11. Tight fitting masks cause inadequate ventilation and increased levels of CO_2 known as hypercapnia. As CO2 is known respiratory stimulant, a build up of exhaled CO_2 between the mask and face will cause increased lung ventilation and respiratory activity. Symptoms of hypoxemia such as chest discomfort and tachypnea are also noted in healthcare professionals with prolonged mask use. Exhaled CO_2 builds up between mask and face, and increased levels of CO_2 cause confusion, impaired cognition, and disorientation.[10] The moist environment and pressure from tight fitting masks also block facial ducts. This can explain the increase of acne with prolonged mask use.[9] Frequent PPE and mask changes may cause shearing and breakdown of the skin, and breakdown on the bridge of the nose and cheek bones can be attributed to tight fitting masks and goggles that put pressure on these specific areas.[12] Urticaria and contact dermatitis can occur from sensitivity to components of masks and PPE.[13] Long term use of face mask may be necessary, but compliance may be low, and physiologic effects have not been well evaluated. The purpose of this study is to determine the physiologic and subjective effects of prolonged use of mask experience by health service providers.

METHODS AND MATERIALS

40 web based survey questions were distributed electronically among health service providers who were working in different hospitals. Total 417 health service providers participated in this study. This study was cross sectional analytical and was done from 01'August, 2020 to 30'September, 2020 in Rangpur Medical College and Hospital. All data generated were statistically analyzed using the computer based SPSS in 23.0 version of windows.

RESULTS

Of total 417 respondents male were 75% and female were 25%. Age of respondents ranged from 18 years to 58 years, 22% ages 18 - 30 years, 46% ages 30 - 40 years, 22% ages 40 - 50 years and 10% ages more than 50 years and mean age were 36.12±14 years. 65% health service providers wore facemask 8 to 12 hours in a day, 30% 4 to 8 hours, 5% wore more than 12 hours and none wore less than 4 hours a day.

Out of 417 respondents, majority (88%) were doctor, 5% were nurse, 5% were ward boy and 2% were other healthcare professionals. All respondents had experienced some sorts of adverse events due to wearing face mask. Among cardiopulmonary experiences 66% had dyspnea, 20% palpitation, increased cough in 18%, 26% had runny nose, 24% developed nasal blockage and 14% experienced sore throat. According to neurological adverse events, 50% respondents developed headache, 20% vertigo, 23% blurring of vision, 67% experienced tiredness and 12% noticed reduction of memory. According to dermatological adverse events, 15% experienced acne, 55% abnormal wrinkles in face and 13% had rash in their face. 81% health service providers developed pain behind the ear, 64% noticed cloudiness of goggles, 34% experienced foul smell in oral cavity and 4% developed oral ulcer. 07% health service providers became rt PCR positive for COVID19 in spite of wearing face mask.

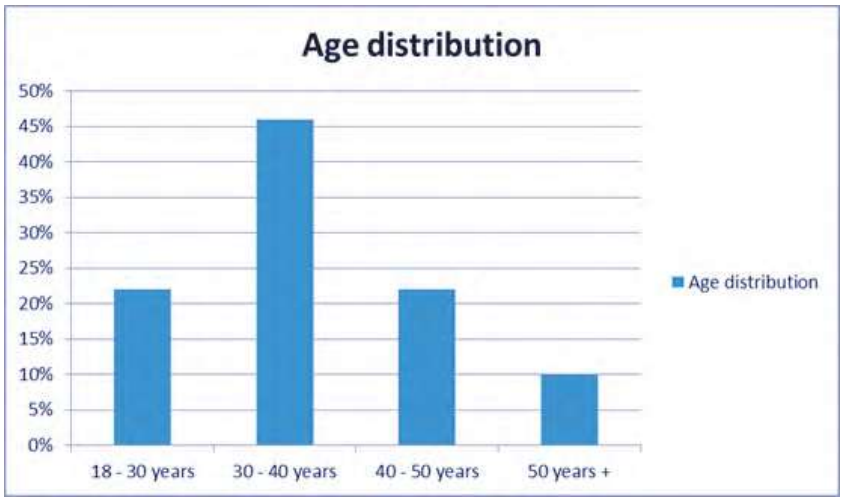

Figure 1: According to age distribution . 22% respondent health service providers were in between 18 - 30 years, 46% were in 30 - 40 years, 22% were in 40 - 50 years and 10% were above 50 years.

Fugure 2: According to duration of using facemask in a day. 65% health service providers wore facemask 8 to 12 hours in a day, 30% 4 to 8 hours and none wore less than 4 hours a day

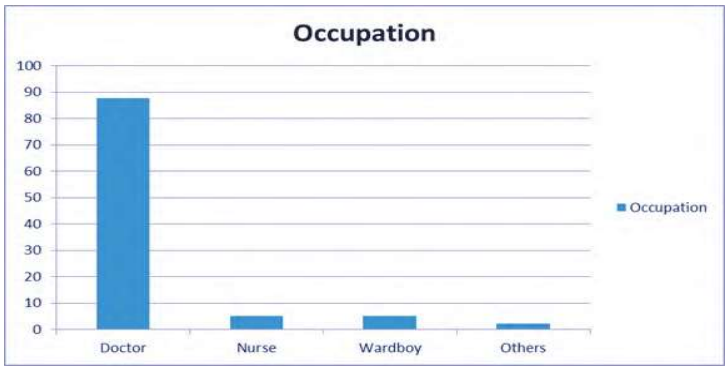

Figure 3: Distribution of the study population according to occupation (N=417). Out of 417 respondents, 88% were Doctor, 5% were Nurse, 5% were Ward boy and 2% were other health service providers.

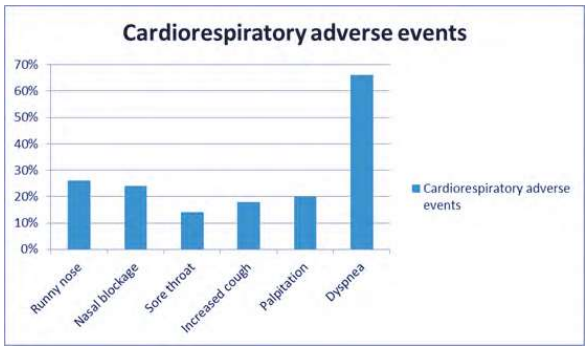

Figure 4: According to Cardiopulmonary adverse events. Among all respondents 66% experienced dyspnea, 20% palpitation, increased cough in 18%, 26% had runny nose, 24% developed nasal blockage and 14% experienced sore throat.

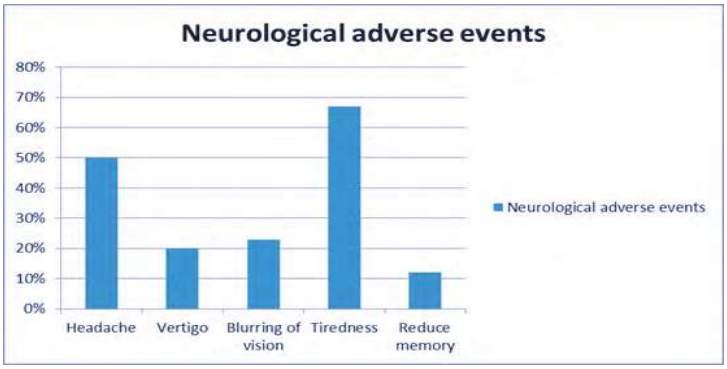

Figure 5: According to neurological adverse events. 50% respondents developed headache, 20% vertigo, 23% blurring of vision, 67% experienced tiredness and 12% noticed reduction of memory

Figure 6): According to dermatological adverse events. 15% experienced Acne, 55% abnormal Wrinkles in face and 13% had rash in their face.

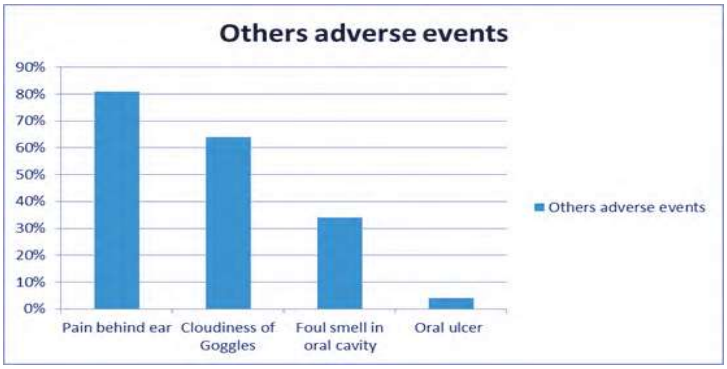

Figure 7: According to others adverse events. 81% health service providers developed pain behind the ear, 64% noticed cloudiness of goggles, 34% experienced foul smell in oral cavity and 4% developed oral ulcer.

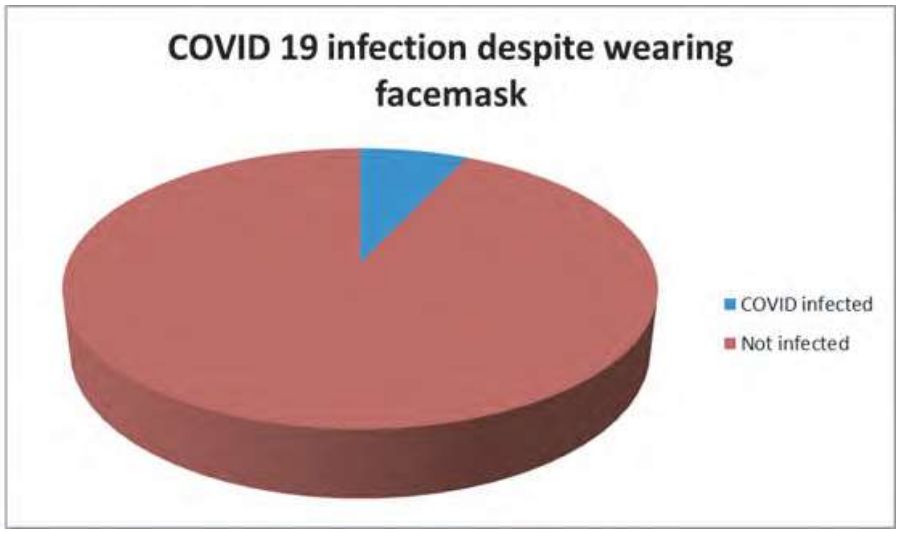

Figure 8: According to develop COVID 19 despite wearing face mask. 07% health service providers developed COVID 19 infection.

DISCUSSION

A profound number of health service providers who participated in this survey reported adverse events to prolonged face mask use during COVID 19 pandemic. Exertional dyspnea (66%), headache (50%), tiredness (67%), pain behind ear (81%), cloudiness of goggles (64%), abnormal wrinkles in face (55%), foul smell in oral cavity (34%) and acne (15%) were all recognized as common adverse effects. Similar distribution was also found in the study conducted by Rosner E et al who found headache in 71.4% , skin breakdown in 47.8% and acne in 11% respondents.[1] Terri Rebmann et al reported many subjective symptoms like perceived shortness of breath, headache, light headedness, perceived exertion and impeded communication. CO_2 levels increased from a baseline average of 32.4 at the beginning of the shift to 41 at the end of each shift.[14] As we are still amidst the pandemic and second wave is predicted in future, tips and recommendations for enduring prolonged mask use are vital for health and comfort of health service providers.

RECOMMENDATIONS

Frequent work breaks to be incorporated into work shifts to allow for shorter duration of mask use. More national concentrations is needed to improve training on using PPE among health service providers. Preventive measures like applying moisturizers, emollients and barrier cream to prevent skin breakdown. Improved mask design with a focus on safety , comfort and tolerability.

CONCLUSION

All respondents had experienced some sorts of adverse events due to wearing face mask. 07% healthcare professionals became rt PCR positive for COVID19 in spite of wearing face mask.

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