ISSN 1992-2426

Osmani Medical Teachers Association Journal

Volume 17: Number 2
July 2018

Teachers Association, Sylhet MAG Osmani Medical College, Sylhet, Bangladesh

Teachers Association, Sylhet MAG Osmani Medical College

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EDITORIAL

The Osmani Medical Teachers Association Journal Volume 17 Number 2

Minimal Access Surgery in Colorectal Cancer - difficulties and challenges

Introduction

Minimal access surgery describes an area of surgery that crosses all traditional disciplines from general surgery to neurosurgery. It is not a discipline unto itself but more a philosophy of surgery, a way of thinking. Minimal access surgery is a means of performing major operations through small incisions often using miniaturized, high tech imaging systems to minimize the trauma of surgical exposure.

Colorectal cancer is the most common malignancy of gastrointestinal tract and third most lethal cancer in United States. In surgical treatment of colorectal carcinoma, a rapid progression from conventional open surgery to minimal access surgery has occurred over the last two decades. Though many surgeons became comfortable with laparoscopic colectomy for benign disease, the application of minimal access surgery for malignant colorectal disease was slow due to oncologic concerns. With time, numerous randomized controlled trials comparing minimal access surgery to open surgery for colon cancer were published which clearly demonstrated that in experienced hands, appropriate oncologic resections can be performed with similar oncologic outcomes to open technique. In contrast, outcomes of MAS for rectal cancer have not yet been definitively studied.

History of Minimal access surgery

Although the term minimal access surgery is relatively recentbut the history of its component parts is more than 100 years. The first introduction of an experimental laparoscopic procedure was by Georg Kelling of Dresden in 1901 In the late 1950s, Hopkins described the rod lens, a method of transmitting light through a solid quartz rod with no heat and little light loss. In the 1970s, the application of flexible endoscopy grew faster than that of rigid endoscopy. First video laparoscopic cholecystectomy was performed in France in mid 1990s. The explosion of video assisted surgery in the past 20 years was a result of the development of compact, high resolution, charge coupled devices that could be mounted on internal end of flexible endoscopes or on the external end of a Hopkins telescope.

The first endoscopic surgical procedure was colonoscopic polypectomy. Percutaneous endoscopic gastrostomy invented by Gaudere and Ponsky may have been the first NOTES procedure reported in 1981. Newer technologies of Minimal access surgery. The acceptance of MAS by both patients and surgeons has led many surgical innovators and industry to develop new technology with the goal of less invasive approaches. The advent of single incision laparoscopic surgery devices has allowed fewer incisions. Robotic techniques popularized in other specialities, have been applied to surgery for rectal cancer to overcome the limitations of conventional lapaoroscopy in confined working space of pelvis. The clinical application of NOTES has not yet fully transpired, though there have been major advances as instrumentation improves. Laparoendoscopic single site surgery (LESS) is a recent addition to the armamentarium of MAS.

The term robot defines a device that has been programmed to perfrom specific tasks in place of those usually performed by people. The major revolution in robotic surgery was the development of a master-slave surgical platform that returned the wrist to laparoscopic surgery and improved manual dexterity by developing an ergonomically comfortable work station with 3-D imaging, tremor elimination and scaling of movement.

Advantages of Minimal access surgery

Generally larger incisions are associated with more post operative pain, longer recovery periods, a period of physical disability, greater morbidity in cases of wound infection, more risk of incisional hernias and a higher rate of symptomatic adhesive bowel obstruction in future. Image guided surgery greatly diminishes postoperative pain and morbidity of wound infection and longer term problems. Minimal access surgery can also be used as a learning aid as this is ideal for recording static images or videos for documentation of findings. These images can be attached to medical record and stored with radiolgic picture archiving and communication system. These can be reviewed with radiologist, pathologist and other consultants for patient care or quality improvement initiatives also.

Difficulties and challenges in Minimal access surgery in Colorectal carcinoma

To perform minimal access surgery with safety, the surgeon must operate remote from the surgical field using an imaging system that provides a two dimensional representation of the operative site. The instruments are longer which creates significant problems of hand- eye coordination. The learning curve

is well described and long for novice surgeons. There is loss of tactile feedback in context of some procedures to surgeon. Laparoscopic imaging also is monocular compared with binocular view in open surgery as telescopes have a single lens system. Laparoscopy has limited field of view. Another problem occurs when there is intraoperative arterial bleeding. Hemostasis may be very difficult to achieve endoscopically as blood obscures the field of vision and there is significant reduction of image quality due to light absorption. Rectal cancer surgery demands more technical expertise for total mesorectal excision or low pelvic anastomosis. Many have concerns that oncologic principles may be compromised when rectal cancer is treated laparoscopically.

Advantage of minimal access surgery in colorectal carcinoma

Pelvic dissection for rectal carcinoma is technically challenging due to limited visual exposure, operating within a narrow confined space and the possibility of local invasion to surrounding structures. Laparoscopic dissection may overcome some of these difficulties by offering improved visual angles and magnification of pelvis. But few technical challenges must be overcome also. Adequate rectosigmod retraction must be achieved by operative assistant to provide exposure and tissue tension for dissection. Narrow confines of the pelvis limit the mobility of standard laparoscopic instruments. If an anterior resection is performed, the current laparoscopic stapling devices are difficult to maneuver into a narrow pelvis and position for a perpendicular staple line leading to suboptimal distal rectal transection from multiple staple firings.

Despite evidence demonstrating improved short term outcomes of MAS, widespread implementation of this technique was slow. The lack of formalized training, outside single day laparoscopic training courses and the significant learning curve for straight laparoscopic techniques likely represented significant barriers to adoption. This era is of minimal access surgery. So great concern should be taken to improve learning facilities, proper ergonomics and establishment of well equipped centres to popularize minimal access surgery for the betterment of patient's outcome.

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ORIGINAL ARTICLE

The Osmani Medical Teachers Association Journal Volume 17 Number 2

Comparison of Single Dose Regional Antibiotic with Three Dose Intravenous Systemic Antibiotic Preventing Wound Infection in Clean Orthopaedic Procedures

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Abstract

Objective of this study is to evaluate the effectiveness of single dose intravenous regional antibiotic against three dose intravenous systemic antibiotic in clean orthopaedic procedures. This cross sectional comparative study was carried out in the Department of Orthopaedics, Sylhet MAG Osmani Medical College Hospital during the period of January, 2014 to December, 2015. A total of 30 patients admitted in the study place during the study period for orthopaedic surgery fulfilling inclusion and exclusion criteria were enrolled in this study. The patients were informed in details regarding the procedure of the study and written consent were obtained. Each patient was provided a random number and those with even was included in the group who were received single dose regional antibiotic (Group I) and those with odd number was treated with three doses of systemic antibiotics (Group II).Male and female were equal in number in group I but in group II male were predominant than female. Maximum patients were in age group 21 - 40 years in both groups followed by <20 years and 41 - 60 years. Length of incision was 6 - 10 cm in 14 out of 15 cases in group II but in group I, 7 patients (43.8%) had 6 - 10 cm , 6 patients (40.0%) had 11 - 14 cm incision and 2 patients (13.3%) had >14 cm. There was statistical significant difference between group-I and group-II. Mean (SD) preoperative hospital stay was 14.2 (6.7) days in group I and 13.7 (4.9) days in group II. There were no statistical significant differences in serous exudates, erythema, purulent and separation of deep tissue between two groups. Patients of group II (3.33 ± 0.97 days) stayed in hospital less than that of patients of group I (4.06 ± 2.40 days). All cases were satisfactorily healed in group II.Even 13 out of 15 cases were satisfactorily healed also in group I, there were two cases with disturbance of healing. Single dose intravenous regional antibiotic is as effective as three dose intravenous systemic antibiotic in clean orthopaedic procedures. Systemic Antibiotic, Clean Surgery

[OMTAJ 2018; 17 (2)]

Introduction

Surgical Site Infection (SSI) is one of the most common healthcare associated infections (HAI). Use of prophylactic antibiotics has lowered the incidence of superficial and deep wound infections after surgery. Prophylactic administration of antibiotics inhibits growth of contaminating bacteria[1] and their adherence to prosthetic implants, thus reducing the risk of infection. By definition, prophylactic antibiotic treatment is the use of antibiotic before, during, or after a diagnostic, therapeutic, or surgical procedure to prevent infectious complications. Therapeutic antibiotic treatment is the use of substances that reduce the growth or reproduction of bacteria, including eradication therapy[2]. This term is used to describe antimicrobial therapy prescribed to clear infection by an organism or to clear an organism that is colonising a patient but is not causing infection. In clean orthopaedic surgery, the occurrence of deep infective complications involving the implants used can be devastating, often requiring additional surgical[3].

Presence of biomaterial in the wound is susceptible to bacterial colonization4 . Every wound has its own critical inoculum level which is probably lower in bone than in soft tissue and it is about 10^5 organisms[5]. Reducing the number of bacteria in the operating room and strict asepsis is the method of choice in reducing the contamination of the wound during the time of operation. Organism given off in the room by the occupants is predominantly pathogenic staphylococci and occasional streptococci, the carriers of this organism in the nose and mouth and these organisms are removed rapidly by clean circulating air from an efficient

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ventilating systems[2]. Reduction of air borne organisms by 90% is possible using a disposable drape and gowns compared to cloth[6]. A relatively small number of bacteria are required to produce overt tissue infection in the presence of foreign material or an implant. High risk factors predisposing to infections are preoperative antibiotic, diabetes, and anaemia with a haemoglobin level less than 60% and hypoalbuminaemia[7]. Prophylactic systemic antibiotic is administered 4 hours prior to surgery and after surgery, with mild unrecognized respiratory, kidney and bowel infection[8]. In theory, maintaining concentrations beyond the time of potential contamination attains no additional benefit. Prophylaxis that is both brief and inexpensive may be effective[9].

There is significant reduction of infection with prophylactic antibiotic compared with placebo in conventional operation theatre (0.7% & 5.2%). Single per operative dose of cephalosporin was as effective as cephalosporin began the night before surgery and continued for 4 days post operatively in patients undergoing a variety of surgical procedures[10]. Effective prophylaxis depends on effective concentrations throughout the period of potential tissue contamination[11]. Use of more expensive drugs, assuming equal effectiveness, would erode the financial benefit of prophylaxis[9]. Large group of operative procedures, in which large foreign implants are implanted, infection in this group of patients can be so catastrophic that antibiotic prophylaxis is both justifiable and necessary. In general, the greater the expected infection rate and the more catastrophic the results of an infection would be, the more important prophylactic antibiotics become. Thus, use of maximum dose of drugs in critical time is beneficial[12].

A single standard therapeutic dose of antibiotic is sufficient for prophylaxis under most circumstances[13]. Intravenous prophylactic antibiotics should be given 30 minutes before the skin is incised. Antibiotic prophylaxis administered too late or too early reduces the efficacy of the antibiotic and may increase the risk of SSI. Administration of antibiotic more than three hours after the start of the operation significantly reduces its effectiveness[14]. Additional dosage may be indicated for longer surgery or shorter-acting agents to maintain activity for the duration of the operation. In the event of major intraoperative blood loss in adults (>1,500 ml), additional dosage of prophylactic antibiotic should be considered after fluid replacement[15]. In arthroplasty there is evidence from a very large observational cohort that 24 hours of antimicrobial prophylaxis is associated with lower rates of reoperation than a single dose[16]. Use of antibiotics is not without any drawbacks. The risks associated with antibiotic use include allergic reactions, anaphylactic shock, antibiotic-associated Clostridium Difficile diarrhea[17], and the development of antibiotic resistance[18]. Rates of antibiotic resistance are increasing in all hospitals[19]. The prevalence of antibiotic resistance in any population is related to the proportion of the population that receives antibiotics and the total antibiotic exposure[20]. Increased antibiotic use leads to more resistance as demonstrated by a variety of large and small scale studies[21]. Three uncontrolled observational studies showed that when antibiotics were given for surgical prophylaxis there was an increased risk of acquiring antibiotic resistant strains following treatment[22]. This study is intended to evaluate the efficacy of single dose of prophylactic antibiotic against three doses of antibiotic in clean orthopaedic surgical procedure.

Material and Methods

This Cross sectional comparative study was carried out at Department of Orthopaedic Surgery, Sylhet MAG Osmani Medical College Hospital from 1st January, 2014 to 31st December, 2015. All the patients admitted in the study place during the study period for orthopaedic surgery fulfilling inclusion and exclusion criteria were enrolled in this study.Patient underwent clean orthopaedic procedure was the inclusion criteria. The patients were informed in details regarding the procedure of the study and written consent were obtained. Each patient was provided a random number and those with even was included in the group who were received single dose regional antibiotic and those with odd number was treated with three doses of systemic antibiotics. There were 15 patients in each group. The salient results based on minimum 6 months follow-up. Data were collected by investigator and then recorded in a structured preformed questionnaire. The quantitative data will be expressed as mean and standard deviation and qualitative data as frequency distribution and percentage. Data were processed and analyzed using Computer based SPSS (statistical package for social science) soft-ware for windows, version 16. Data presented on categorical scale will compared between groups with the help of Chi-square (X2) or Fisher's Exact Probability Test. Quantitative data were compared between groups using Student's t-Test, multivariate logistic regression analysis and fisher's exact test, as applicable. P value of less than 0.05 will be considered as significant.

Operative Procedure

Group I: Single dose regional antibiotic : The extremity was clean shaved and washed with soap water prior to operation. After induction of anesthesia, the intravenous cannula was inserted into the extremity to be operated on. The extremity was then exsanguinated and tourniquet

was applied. Antibiotic was then pushed through the cannula. 750 mg Cefuroxime in 20-40 ml for upper extremity vein and 40-60 ml distilled water for lower extremity vein depending on size of the limb. Cannula was then removed and an antiseptic skin preparation was done by Povidone Iodine 10% solution. All operations were done in a conventional operation theatre. Tourniquet was released and haemostasis was done in all the cases. The wound was irrigated with normal saline. Povidone iodine (10%) solution was used around the wound prior to wound closure. A close drainage tube was used in all cases and removed after 72 hours. No antibiotic was used subsequently. In addition to usual aseptic precaution, two BP blades one for skin incision and another for soft tissue dissection in deeper plane was used. The surgeon was used two pairs of gloves. Stitches were removed after one week for the upper extremity and 10-14 post operative days in lower extremity operations.

Group II: Three doses of systemic antibiotic: The extremity was clean shaved and washed with soap water prior to operation. All operations were done in a conventional operation theatre. Tourniquet was released and haemostasis was done in all the cases. The wound was irrigated with normal saline. Povidone iodine (10%) solution was used around the wound prior to wound closure. A close drainage tube was used in all cases and removed after 72 hours. Three doses of Inj. Cefuroxime Intravenous 1.5 gm at induction of anaesthesia followed by 750 mg IV at 8 & 16 hours was used.

Follow up: Check dressing and wound inspection done on 3rd post operative day. Stitches were removed after one week for the upper extremity and 10-14 post operative days in lower extremity operations. Patients were followed up 3 weeks after removal of stitches, then 6 weeks after operation for soft tissue procedures. For the bony procedures in addition, patients were followed up every 3 month up to 1 year and subsequently if there is pain at the operation site. Development of infection in the primary operative incision(s) was considered as failure of anti microbial prophylaxis.

Results

Table I: Distribution of patients according to age (n=30)

Age (years)	Group		p
	Group I n (mean±SD)	Group II n (mean±SD)	
≤20	7 (19.14 ± 0.89)	6 (18.67 ± 0.81)	>0.05
21-40	8 (32.44±7.10)	6 (35.66 ± 5.64)	
41-60	0 (0.0±0.0)	3 (40.33 ± 4.16)	
Total	**15 (26.62±8.58)**	**15 (29.80±10.28)**	

Chi square test was done to measure the level of significance

Table I shows distribution of patients according to age. Maximum patients were in age group 21 - 40 years in both groups followed by <20 years and 41 - 60 years. Most of the patients in group-I (100.0%) and group-II (80.0%) were at or below 40 years. There was no statistical significant difference between the age groups of the patients in group-I and group-II.

Table II: Distribution of patients according to gender (n=30)

Gender	Group		p
	Group I	Group II	
Male	7 (46.7)	11 (73.3)	>0.05
Female	8 (53.3)	4 (26.7)	
Total	**15 (100.0)**	**15 (100.0)**	
Ratio	**1:1.14**	**2.75:1**	

Chi square test was done to measure the level of significance

Table II shows distribution of patients according to gender. Male and female were equal in number in group-I but in group-II male were predominant than female. But there was no statistical significant difference between group-I and group-II.

Table III: Distribution of patients according to length of incision (n=30)

Length of incision (cm)	Group		p
	Group I	Group II	
6 – 10	7 (46.7)	14 (93.3)	>0.05
11 – 14	6 (40.0)	1 (6.7)	
>14	2 (13.3)	0 (0.0)	
Total	15 (100.0)	15 (100.0)	

Chi square test was done to measure the level of significance

Table III shows distribution of patients according to length of incision. Length of incision was 6 - 10 cm in 14 out of 15 cases in group II but in group I, 7 patients (43.8%) had 6 - 10 cm , 6 patients (40.0%) had 11 - 14 cm incision and 2 patients (13.3%) had >14 cm. There was statistical significant difference between group-I and group-II.

Table IV: Pre operative hospital stay

	Group		p
	Group I Mean (SD)	Group II Mean (SD)	
Preoperative hospital stay (days)	14.2 (6.7)	13.7 (4.9)	>0.05

Unpaired t test was done to measure the level of significance

Table IV shows there was no statistical significant difference in preoperative hospital stay between group-I and group-II.

Table V: Condition of the wounds

Condition of the wounds	Group		p
	Group I Mean (SD)	Group II Mean (SD)	
Serous exudate	2.12 (0.95)	1.93 (0.45)	>0.05
Erythema	2.75 (0.57)	2.80 (0.41)	>0.05
Purulent	2.00 (1.73)	0 (0.0)	
Separation of deep tissue	2.33 (1.52)	0 (0.0)	

Table VI shows condition of the wounds in two groups. There were no statistical significant differences in serous exudate, erythema, purulent and separation of deep tissue between group-I and group-II.

Table VI: Post operative hospital stay

Post operative hospital stay (days)	Group		p
	Group I	Group II	>0.05
	4.06 (2.40)	3.33 (0.97)	

Unpaired 't' test was done to measure the level of significance

Table VII shows there was no statistical significant difference in post operative hospital stay between group-I and group-II.

Table VII: Distribution of patients according to category of infection

Category of infection	Group		p
	Group I	Group II	
Satisfactory healing	13 (81.3)	15 (100.0)	
Disturbance of healing	2 (12.4)	0 (0.0)	>0.05
Total	16 (100.0)	15 (100.0)	

Chi square test was done to measure the level of significance.

Table VIII shows distribution of patients according to category of infection. All cases were satisfactorily healed in group II. Even 14 out of 16 cases were satisfactorily healed also in group I; there were two cases with disturbance of healing and one case with minor wound infection. But there was no significant difference in infection between group-I and group-II.

Discussion

Surgical Site infection (SSI) remains an important cause of postoperative complications. Infection in orthopedic surgery is one of the most dreaded complications. It is associated with prolonged morbidity, disability and increased mortality. Surgical site infection in clean wounds includes incisional and organ space infections. This cross sectional interventional comparative study was conducted in the Department of Orthopaedics, Sylhet MAG Osmani Medical College Hospital during the period of January, 2014 to December, 2015 to evaluate the efficacy of Single dose Intravenous Regional Antibiotic against three dose Intravenous systemic antibiotic in Clean Orthopaedic Procedures. Patients of group I were treated with single dose intravenous regional antibiotic and group II were treated with three doses intravenous systemic antibiotics In this study, maximum patients were in age group 21 - 40 years in both groups followed by <20 years and 41 - 60 years. There was no statistical significant difference between these two groups. Mean age was 35.51±20.79 years in group I and 26.17±19.79 years in group II [23]. Male and female were equal in number in group I but in group II male were predominant than female. But there was no statistical significant difference between these two groups. But there was a significantly higher proportion of male patients in group II than in group I (p=0.006) [23].

Length of incision was 6 - 10 cm in 14 out of total 15 cases in group II but in group I 7 patients had 6 - 10 cm, 6 patients had 11-14 cm and 2 patients had more than 14 cm incision. There was statistical significant difference between these two groups. Mean (SD) preoperative hospital stay was 14.2 (6.7) days in group I and 13.7 (4.9) days in group II. There was no statistical significant difference in preoperative hospital stay between two groups. There were no statistical significant differences in serous exudate, erythema, purulent and separation of deep tissue between two groups. Even though there was no statistical significant difference in post operative hospital stay between two groups but we can see patients of group II (3.33 ± 0.97 days) stayed in hospital less than that of patients of group I (4.06 ± 2.40 days). There was no significant difference between the two groups regarding mean duration of stay in hospital[23].

All cases were satisfactorily healed in group II. Even 13 out of 15 cases were satisfactorily healed also in group I; there were two cases with disturbance of healing. There was no significant difference between these two groups. In single dose antibiotic prophylaxis, rate of infection was 4.54% while in 3-dose therapy rate of infection was 7.77% [24]. Our result is reverse to their study. Two cases of disturbance of healing were for superficial surgical site infection probably the cause was skin necrosis due to tight plaster and swelling immediately after operation. No deep SSI was found. The skin was dressed regularly and skin grafting done later on.

Conclusion

In this study it was observed that duration of post operative hospital stay and infection was comparatively higher in single dose intravenous regional antibiotic group than that of three doses intravenous systemic antibiotic group but there was no statistical significant

difference between these two groups. So, it can be concluded that Single dose Intravenous Regional Antibiotic is as effective as three dose Intravenous systemic antibiotic in Clean Orthopaedic Procedures. But single dose regional antibiotic is better than three doses, as it is cost effective.

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ORIGINAL ARTICLE

The Osmani Medical Teachers Association Journal Volume 17 Number 2

A prospective study on Management of fractures of the distal tibia by minimally invasive plate osteosynthesis in combined Military Hospital, Dhaka.

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Abstract

Minimally invasive plate osteosynthesis (MIPO) is an established technique for fixation of fractures of the distal third tibia. But treating distal tibia fractures is often challenging because of soft tissue damage around the fracture , the risk of infection and other complications with internal fixation and the accompanying incisions. Our study aimed to evaluate the functional outcome, duration to union, advantages and complications using this technique and follow them prospectively. Fifty Four adult patients with fractures of distal tibiawere operated by MIPO technique with a distal tibial anatomical locking plate& were followed for a period of 2 years (August 2015 to August 2017) The mean fracture healing time was 20.41 weeks with a range of 16-28 weeks and average AOFAS score 96.1 was out of a total possible 100 points. Based on this scores excellent results were obtained in 47(87%), good in 4 and fair in 3 cases. MIPO technique provides effective stabilization of distal tibia fractures and decreases incidence of nonunion It not only helps in achieving reduction in difficult situations, but also in rapid union, because it facilitates preservation of the blood supply to the fragment and anatomical reduction of the fracture. Distal third tibia fracture, Minimally invasive plate osteosynthesis (MIPO), Locking compression plate (LCP).

[OMTAJ 2018; 17 (2)]

Introduction

Distal tibial fracture has always been challenging despite of their best method of management due to subcutaneous location of larger portion of the tibia, paucity of soft tissue coverage and precarious blood supply to the distaltibia.[1] Fractures of the distal third tibia are unique in that the bone is subcutaneous with depleted muscular cover; the consequent decreased vascularity leads to complications like delayed bone union, wound complications such as dehiscence and infection. These fractures can be managed with various techniques. Small wire fixators,[2-4] and Open reduction and plating,[5,6] have been used with varying results.[7]

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In current orthopaedic practice, minimally invasive plating osteosynthesis (MIPO) and interlocking nailing are the preferred techniques for fractures of the distal third tibia. The intramedullary nail spares the extraosseous blood supply, allows load sharing, and avoids extensive soft tissue dissection.[8,9] However, proximal and distal shaft fractures can be difficult to control with an intramedullary device, increasing the frequency of malalignment.[10] Concerns regarding difficulties with reduction, inappropriate fixation in fractures with articular extension, anterior knee pain[10] and hardware failure have slowed the acceptance of intramedullary nailing as a treatment of fractures of the distal tibia. The recent innovation of nails with tip locking is a testimony that earlier nails were insufficient fixation tools for distal tibia; however tip locking is technically difficult and fractures that require it are essentially difficult to fix with nails.[8,10,12]

Anatomical LCP are commonly used for fracture fixation as it provides an angular stability to the fixation. Locked screws prevent the plate from pressing the bone, preserving periosteal blood supply.This system stimulates callus formation due to flexible elastic fixation. Anatomical shape of the plate prevents malalignment of the fracture and provides a better axial and angular weight distribution.[13] Minimally invasive submuscular and subcutaneous plate fixation (MIPO) can address several of the issues associated with intramedullary nailing, while amalgamating all biological benefits of closed reduction and fixation.[14,15] We studied the clinical indications and efficacy of MIPO in close fractures of distal third tibia.

Materials and methods

From August 2015 to August 2017, we conducted a prospective case series at our Combined Military Hospital,Dhaka,Bangladesh. A total of 54patients were included. The study was approved by our institutional ethicalcommittee . All patients with age more than 18 years, closed fractures of the distal third tibia with or without intra articular extension, upto 1 week old and Gustilo and Anderson Grade I compound fractures of the distal third tibia presented within six hours from time of injury,were included in the study. Informed consent for both the surgery and inclusion in the study were taken before the procedure. We excluded patients

with pathological fractures, fractures older than 1 week, Gustilo and Anderson Type II and Type III fractures, and elderly patients with multiple co-morbid conditions. After stabilizing the traumatised patient, routine pre-anaesthetic investigations were carried out. The leg was immobilised in a plaster slab till definitive surgery.Complete preoperative radiographic assessment was done and preoperative plan was prepared. Broad spectrum intravenous antibiotics were given immediate preoperatively. The patient was positioned supine on a radiolucent operating table under regional anaesthesia with a tourniquet. Locking Plate Osteosynthesis is done with the MIPO technique. A vertical or curvilinear incision was made at the level of medial malleolus with utmost care not to injure great sepheneous vein and sepheneous nerve. Subcutaneous plane was made without striping periosteum and disturbance to fracture haematoma.Fracture was reduced under C-arm guidance. Precontoured anatomical LCP was tunnelled into subcutaneous plane by retrograde technique and its position was reconfirmed with C-Arm and was fixed with screws.

Locking sleeves can be attached to plate and used to hold the plate at distal end while insertion. Plate is passed in such a way that end of plate is visualized adequately and screws can be inserted distally. Using C arm plate is adjusted to meet the contour of the bone. Fracture reduction is achieved under image intensifier by assessing length, axial and rotational alignment by indirect means without opening the fractured area. Plates can be held temporarily by K wires whenever required. Varus-valgus angulation of <50, anterior posterior angulation $<10^0$, and shortening of <15mm were considered acceptable reduction. Sagging of distal fragment at fracture site-can be prevented by elevating fracture site with a bolster and plantar flexion of foot . Non locking screws were inserted first in either the proximal or distal fragment as required to aid in the reduction of the fracture so as to pull the bone to the plate.

The locking screws were inserted only and only when the fracture reduction was satisfactory. The proximal holes can be located in thin patient by palpation through the skin. A similar sized LCP placed over the skin helped localise the hole in the inserted plate (Mirror plate technique[17]). Remaining screws are inserted by stab incisions. At least 6-8 cortices were held proximal and distal to fracture site. Associated fibula fractures when present at syndesmotic level was fixed with plates. Wound was irrigated with saline and closure done in layers. Sterile dressing was done and well padded posterior splint was given with ankle in neutral position.[16]

Static quadriceps exercises & toe movements, as tolerated were begun from 1st postoperative day. Ankle mobilization was started from 3rd postoperative day. Intra-venous antibiotics were given for 3 days followed by a course of oral antibiotics for 5 days. Analgesics were given as per need. Suture removal was done on 14th Postoperative day. Protected weight bearing was allowed only once signs of progress toward union were evident, usually at 6 weeks postoperatively. Clinically union was defined as painless fracture site during full weight bearing. Splint was continued for 4-6 weeks. Weight bearing was increased depending on the progress of clinical and radiological fracture healing. Full weight bearing was allowed at fracture union, which was defined as union in 3 cortices and painless weight bearing usually after 10 to 12 weeks . Patients were followed up for a period of 1 year at 6 weeks, 16weeks, 6 months and 1 year . At the final follow up patients were evaluated using American Orthopaedic Foot and Ankle Society (AOFAS) score .[7,1316]

Results

Table I: Distribution of Trauma patients according to age and sex (n=54)

Age group (Years)	Number patients	of Male	Female	Percentage (%)
<20	4	3	1	7.4
21-30	17	12	5	31.5
31-40	15	11	4	27.8
41-50	11	7	4	20.4
51-60	5	3	2	9.2
>60	2	2	0	3.7
Total	54	38 (70.4%)	16 (29.6%)	100

M:F-2.4:1

The age of the patients ranged from 18 to 66 years with mean age of 36 years. Most of the patients (n= 32,59.3%) were in the age group of 20-40 years. There were 38 male and 16 female patients included in the study (Table-I).

Table- II: Distribution of patients according to etiology and side of injury (n=54)

Etiology	Left side	Right side	Total	Percentage (%)
Road traffic accident	17	16	33	61.1
Fall from height	6	4	10	18.5
Physical assault	4	3	7	13.0
Others	3	1	4	7.4
Total	30 (55.6%)	24 (44.4%)	54	100.0

The mode of injury in the majority of the patients was road traffic accidents(high energy trauma) (n=33,61.1%) and 10 cases(18.5%) sustained fractures following fall (low energy trauma).30 patients(55.6%) had fracture of left and 24 patients (44.4%) had fracture of right tibia (Table-II).

Table-III: Distribution of patients according to AO/OTA classification (n=54)

Type (AO/OTA)	Frequency	Percentage (%)
Extra-articular i.e.43-A	48	88.9
Partially articular i.e.43-B	4	7.4
Intra articular i.e.43-C	2	3.7
Total	54	100.0

The majority of the fractures operated in our study were extra-articular fractures, i.e. AO/OTA 43-A (n=48,88.9%). We also operated four (7.4%) partially articular AO-OTA 43-B and two (3.7%) intra articular AO/OTA 43-C fracture in our study(Table-III). 40 patients (74.1%) had a both bone leg fracture, with majority of the fibular fractures occurring at the level of the tibial fracture, suggesting a bending mechanism. Out of the 40 patients with an associated fibular fracture, only 10 patients needed fixation of the fibula (25%). Of these, all fibula fractures were fixed with one third tubular plates.

Table-IV: Showing time between trauma and surgery (n-54)

Time duration	Number of patients	Percentage (%)
17 days	43	79.6
>7 days	11	20.4
Total	54	100.0

The average duration between trauma and surgery was 5.6 days with a range of 0-12 days. Most of the cases were operated upon within 7 days of injury (n=43,79.6%) (Table-IV).

The average operative time was 74.6 min with a range of 55-114 min. The majority of the fractures were operated within 100 min of operative time (n=48,88.9%). Operative time was longer in fractures with intra-articular extension or which needed fixation of the fibula.

Table V: Showing duration of fracture union (n=54)

Time duration (weeks)	Number of patients	Percentage (%)
16	4	7.4
20	40	74.1
24	8	14.8
28	2	3.7
Total	54	100.0

The mean time for radiological union was 20.41 weeks with a range of 16-28 weeks. 40 fractures (74.1%) healed at 20 weeks and only 2 fractures (3.7%) need a period of 28 weeks for union (Table-V).

Table-VI: Showing distribution of complications (n=54)

Name of complication	Number of patients	Percentage (%)
Superficial skin infection	4	7.4
Ankle stiffness	3	5.55
Delayed union	2	3.7
Implant failure	1	1.9
Varusmalalignment	3	5.55
Malleolar skin irritation	2	3.7
No complication	39	72.2
Total	54	100.0

In our study,39 patients(72.2%) developed no complication. We encountered superficial infection in 4 (7.4%) of our patients which were managed with dressings and appropriate antibiotics (Table-VI).

Table -VII: Outcomes as per clinical scoring system of AOFAS.

Grade	Frequency	Percentage (%)
Excellent (Score 90-100)	47	87.0
Good (Score 80-90)	4	7.4
Fair (Score<80)	3	5.6
Total	54	100.0

On union, majorityof the patients had an AOFAS score of 90 or greater out of a possible 100 points. The mean score was 96.1. Based on AOFAS scores excellent results were obtained in 47(87%), good in 4 and fair in 3 cases (Table-VII).

One patient of 31 years old smoker who had implant failure 14 weeks post-operatively. There was breakage of plate and screw. In this patient, a tibialinterlocking was done and fracture healed subsequently. There was no non-union in our series.

Discussion

Distal third of tibia fractures are one of the most problematic injuries to manage. Results of operative treatment are dependent on the severity of the initial injury, the quality and stability of the reduction. The mechanism of injury, status of soft tissues, the degree of comminution and articular damage affect the long term clinical outcome. A variety of treatment options are available. But there is no consensus on the best treatment modality[18]. Options for surgical fixation include external fixation, intramedullary nailing and plate fixation. External fixators are used in open fractures with soft tissue injury where nail or plate fixation is contraindicated. Many complications are reported when external fixators are used for definitive management of distal tibia fractures. Review of literature report high rate

of malunion (5-25%), nonunion (2-17%), loss of reduction and pin tract infection (10-100%) which makes it less preferred technique . MIPO is by now an established technique of management of fractures of the distal third tibia.[7,13,16,18,19].

The age of the patients in our study ranged from 18 to 66 years with mean age of 36 years. Most of the patients (n= 32,59.3%) were in the age group of 20-40 years. It is comparable to the studies by Bahariet al.[20] and Redfern et al.[21] The age of the patient had no bearing on the time to union in our study.[7] The mode of injury in the majority of the patients was road traffic accidents (high energy trauma) (n=33,61.1%) and 10 cases(18.5%) sustained fractures following fall (low energy trauma).30 patients(55.6%) had fracture of left and 24 patients(44.4%) had fracture of right tibia. The mode of injury is similar to other studies.[7,13,16] The majority of the fractures operated in our study were extra-articular fractures, i.e. AO/OTA 43-A (n=48,88.9%). We also operated four (7.4%) partially articular AO-OTA 43-B and two (3.7%) intra articular AO/OTA 43-C fracture in our study. 40 patients (74.1%) had a both bone leg fracture, with majority of the fibular fractures occurring at the level of the tibial fracture, suggesting a bending mechanism. Out of the 40 patients with an associated fibular fracture, only 10 patients needed fixation of the fibula (25%). Of these, all fibula fractures were fixed with one third tubular plates. The average duration between trauma and surgery was 5.6 days with a range of 0-12 days. Most of the cases were operated upon within 7 days of injury (n=43,79.6%).These results are comparable to others.[7,13,16] The average operative time was 74.6 min with a range of 55-114 min compares favourably with other studies.[7,22] The majority of the fractures were operated within 100 min of operative time (n=48,88.9%). Operative time was longer in fractures with intra-articular extension or which needed fixation of the fibula.

As the time interval between surgery and the injury increase it becomes more and more difficult to indirectly reduce the fracture fragments. Our operative time is comparable with other studies. In the study by Collinge and Protzman,[23] out of a total 38 fractures, they had one malalignment with >5° angulation and 1 cm shortening. Redfern et al.[21] had 1 malunion in a series of 20 patients treated with MIPO with DCP. In their study on Minimally Invasive Plate Osteosynthesis in distal tibial fractures. Stefano Gheraet al.[24] (2004) reported one malunion out of 18 cases. Helfetet al.[25] in their series of 20 patients of distal tibial fractures treated by MIPO reported 4 cases of malunion; 2 with >5 degrees of varus and 2 with >10 degrees of recurvatum. Our study is comparable to these findings. In our study,39 patients (72.2%) developed no complication. We encountered superficial infection in 4 (7.4%) of our patients which were managed with dressings and appropriate antibiotics.

In the study by Paluvadiet al.[7, 5] patients (10.0%) had post-operative superficial wound infection and 1-patient had a deep infection. The infection rate in the current series is similar to other studies .On the otherhand,open reduction and internal fixation leads to increased risk of infection and nonunion.[21,26] The mean time for radiological union was 20.41 weeks with a range of 16-28 weeks. 40 fractures (74.1%) healed at 20 weeks and only 2 fractures (3.7%) need a period of 28 weeks for union.Inthe series of fractures by Paluvadi et al.[7] the mean time to union was 21.4 weeks with a range of 16-32 weeks. 96% fractures united within a period of 25 weeks. Lau et al.[27] reported the average time to radiological bony union as 18.7 weeks, which ranged from the shortest 12 weeks to the longest 44 weeks. In the study of Bahari et al.[20] mean fracture healing in distal tibial fractures was found at 22.4 weeks postoperatively Redfern et al.[21] in their study reported that the mean time to union for distal tibial fractures was 23 weeks (range: 18-29 weeks), without need for further surgery.

Paluvadi et al.[7] found the mean time to union in smokers was 22.63 weeks while the mean time to union in non-smokers was 20.68 weeks, which was found statistically significant at 10% level of significance. Ravindraet al.[28] found the average duration to union was 16 weeks with two cases of delayed union (>20 weeks) due to superficial infection. On union, majority of the patients had an AOFAS score of 90 or greater out of a possible 100 points. The mean score was 96.1. Based on AOFAS scores excellent results were obtained in 47(87%), good in 4 and fair in 3 cases.One patient of 31 years old smoker who had implant failure 14 weeks post-operatively. There was breakage of plate and screw. In this patient, a tibial interlocking was done and fracture healed subsequently. There was no non-union in our series.

The AOFAS score of this present study is comparable with Paluvadiet al.[7] On union, all of the 50 patients had an AOFAS score of 90 or greater out of a possible 100 points. The mean score was 95.06. Collinge and Protzman[23] reported a good to excellent result with a mean AOFAS score of 85. In the study undertaken by Redfern et al.[21] all patients returned to their pre-injury occupation or level of activity. The mean AOFAS score in the MIPO group of the study by J JGuoet al.[9] was 83.9. Akram et al.[13] found 46 patients (76.66%) had excellent results, 8 patients (13.33%) had good result, 4 patients (6.66%) had fair results and 2 patients (3.33%)

had poor result according to the clinical rating system by Teeny and Wiss.Fractures with minimal involvement of the ankle can be treated successfully by intramedullary nailing but this technique is inappropriate for pilon fractures with significant articular involvement.[29] Modern tibial nail designs have interlocking holes that enable distal placement of screws in close proximity to the tip of the nail, but these screws have less purchase in metaphyseal bone; there is increased stress on the screws to maintain fracture alignment. Consequently late complications, in particular loss of reduction, are attributed to implant failure at the distal locking sites of the intramedullary nail.[30] Removal of LCP can be difficult and includes all general risks associated with surgical procedures. Complication rates of 20% have been reported. Stripping of screw head or threads occurs frequently. Screw extraction devices cannot be engaged to remove locking screws which makes the procedure cumbersome.[31] The locking compression plate (LCP) is part of a new plate generation requiring an adapted surgical technique and new thinking about commonly used concepts of internal fixation using plates.

Conclusion

The MIPO technique is a reliable fixation approach to fractures of the distal third tibia, preserving most of the osseous vascularity and fracture haematoma and thus providing for a more biological repair. MIPO technique provides effective stabilization of distal tibia fractures and decreases incidence of nonunion It not only helps in achieving reduction in difficult situations, but also in rapid union, because it facilitates preservation of the blood supply to the fragment and anatomical reduction of the fracture. It is a simple, rapid and straight forward procedure which has good results. There was reduced incidence of infection due to limited exposure. Infection can also be prevented by careful handling of soft tissues and by minimizing the operating time.

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ORIGINAL ARTICLE

The Osmani Medical Teachers Association Journal Volume 17 Number 2

Functional & aesthetic outcome of Roux-trotter and Mc Gregor lower lip splitting incisions; A clinical analysis.

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Abstract

The lower lip splitting incision has been widely used in head and neck cancer surgery to provide improved access to intraoral, pharyngeal and parapharyngeal tumors as well as to the cervical part of the spinal column. The study analyses the functional and esthetic aspects of these incisions to avoid unwanted post-operative embarrassment relating to these incisions. The objective of this study is to analyze the functional and esthetic outcome of lower lip-splitting incisions in terms of lip sensation, lip movement, oral continence, vermillion appearance and lip skin appearance. The non-randomized non-blinding controlled study was conducted in Indoor clinic of Oral and Maxillofacial Surgery Department, Dhaka Dental College Hospital from July' 2013 to March' 2014. A total of thirty patients were enrolled. Out of 30 patients 15 of them had Roux-Trotter & 15 of them had McGregor lower lip splitting incisions. Then follow-up was given at 3rd and 6th post-operative week. The patients were asked to answer a questionnaire regarding the degree of satisfaction about cosmetic result of the procedure and were clinically assessed for sensory and functional impairment resulting from the incision. In this study the McGregor incision produced the best results across most parameters but the Roux incision had good functional results with less esthetic results. The statistical analysis revealed that there was not much difference in the examiner and patient evaluation .The McGregor incision produced the best results with a more satisfactory results in all parameters evaluated. The modifications of the lip-splits produce good results apart from ensuring adequate tumor clearance.

Key words: Lower lip splitting incisions- Roux-trotter and McGregor, Functional outcome, Aesthetic outcome

[OMTAJ 2018; 17 (2)]

Introduction

The lower lip-chin splitting incision has been widely used in oral & maxillofacial surgery to provide improved access to intraoral tumours. It is also used by head & neck surgeons to provide access to pharyngeal and parapharyngeal tumours, as well as to the cervical part of the spinal column. A large benign lesion (such as large ameloblastoma of mandible) and malignancies of oral cavity invading mandible which requires hemimandibulectomy can be easily accessed by lip splitting. The lip splitting incision improves oral access to pathological conditions of the maxillofacial region. The lower lip split with mandibulotomy displays the oral cavity, pharynx and upper cervical spine. Transfacial approaches incorporating lip splits attempt to use anatomical landmarks and good principles of incision design to hide the resultant scar line[1].

A midline split of the lower lip and mandible in the surgical approach to tumour of the anterior tongue was first described by Roux in 1839[2]. Trotter extended this approach by dividing the tongue in the midline to expose tumours of the posterior tongue and pharynx[3]. This midline incision lies in a relaxed skin tension line[4] and minimizes injury to the muscles, vessels and nerves of the lower lip. However, both contracture of this straight line scar over the lower lip below the vermilion border together with a depression of the vertical line over the chin prominence may combine to produce an unsightly scar. McGregor modified the midline lip splitting incision to follow the outline of the labiomental groove and chin prominence[5]. This modification breaks up the straight line of the scar and attempts to conceal the incision in the skin crease. However, the semi-circular incision around the chin prominence crosses vertical relaxed skin tension lines along much of its course with the potential to produce a more noticeable scar. Contracture of the straight midline scar over the lower lip below the vermilion border may still occur. This study was aimed to evaluate & compare the aesthetic & functional outcome of two most widely used lower lip splitting incisions that is Roux-Trotter & McGregor incision.

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Appendix- A Photographs

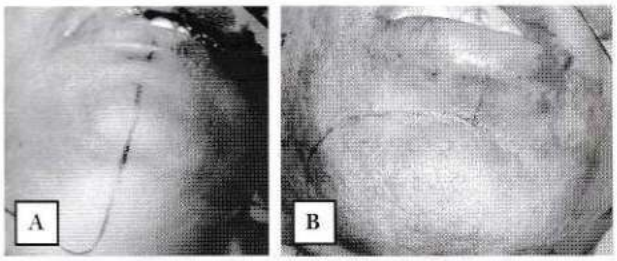

Fig : Peroperative images showing incision design A) Roux-Trotter incision, B) McGregor incision.

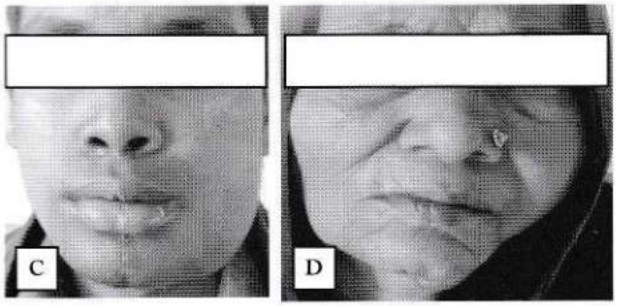

Fig : Images showing postoperative view of C) Roux-Trotter incision, D) McGregor incision.

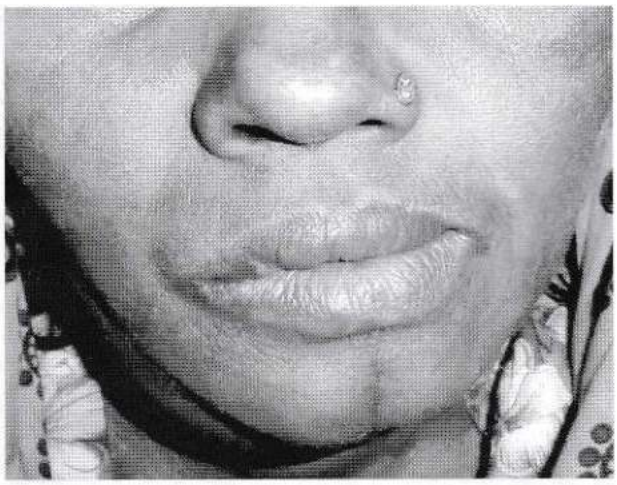

Fig: Post-operative image of Roux-Trotter incision resulting in division of chin pad.

Material and Methods

This Study was carried out in the department of Oral and Maxillofacial Surgery, Dhaka Dental College & Hospital from July, 2013 to march, 2014.Study population included patients who had been admitted in Dhaka Dental College & Hospital with intra oral tumours needing surgery by lower lip splitting incisions. Sampling method was convenient sampling. It is a comparative study between Roux-Trotter & McGregor lower lip splitting incision. Patients having surgery during the study period were evaluated post-operatively at 3rd week and 6th week. Patients were evaluated for aesthetic & functional outcome. For malignant diseases where neck dissection was planned, at first neck dissection was done & then lower lip splitting incision was designed. (Fig: Appendix-A)Roux-Trotter incision was given by no.10 BP blade at straight midline incising lip & chin at middle. Skin, muscle & mucosa were incised. Then intra-oral lesion was exposed. After removal of lesion during wound closure lip wound was closed in three layer that is mucosa & muscle (orbiculris oris) by 3/0 round body vicryl and skin by 4/0 cutting body prolene. Chin was closed in two layer that is muscle with periostium by 3/0 round body vicryl and skin by 4/0 cutting body prolene.

In case of McGregor incision, no. 10 BP blade was used to incise the lip in the middle to follow the outline of labiomental groove and chin prominence. Skin, muscle & mucosa were incised. Then intra-oral lesion was exposed. After removal of lesion during wound closure lip wound was closed in three layer that is mucosa & muscle (orbiculris oris) by 3/0 round body vicryl and skin by 4/0 cutting body prolene. Chin was closed in two layer that is muscle with periostium by 3/0 round body vicryl and skin by 4/0 cutting body prolene. The patients evaluated the results subjectively by answering a questionnaire while, at the same visit, they were clinically assessed by the examiner.

The evaluation parameters were: vermilion appearance (presence of notching), lip skin appearance, lip sensation, lip movement, and oral continence. Results were classified as good or poor. The data gleaned from the questionnaire and the information collected from evaluation of the patients were tabulated and analyzed according to type of lip-splitting incision.

A standardized structured data collection was used to collect necessary information of the subject group. Data sheet included all of the variables regarding to the study. Data were screened and cleaned for any discrepancy. After cleaning data were entered in to template of SPSS@17 software. Demographic and baseline characteristics were compared with the use of chi-square test for categorical variables and analysis of variance acceptance test for continuous variables. Descriptive statistics were generated to see the distribution of baseline characteristics of the patient. A two-sided $p<0.05$ level of significance was selected for all analysis. An informed written consent was taken from every patient explaining the nature and objectives of the study.

Results

Table I : 3.1 Age distribution:

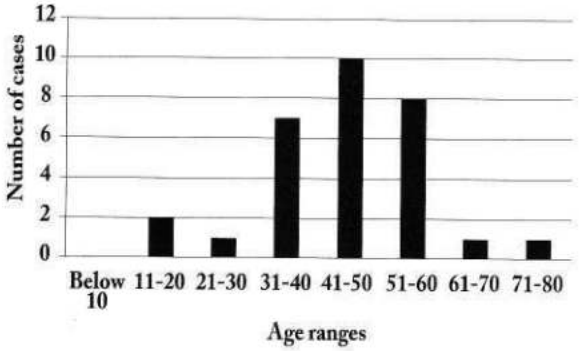

Figure 3.1 demonstrates highest percentage (33%) of the total subject from both group was from the age group 41-50 years.

Table II : 3.2 Sex distribution :

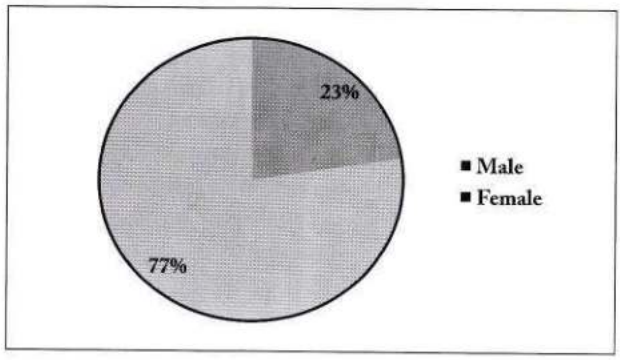

Figure 3.2 demonstrates the sex distribution of the subjects. In this study among 31 patients, male were 7 (23%) and female were 23 (77%).

Table III : 3.3 Name of the surgical incision :

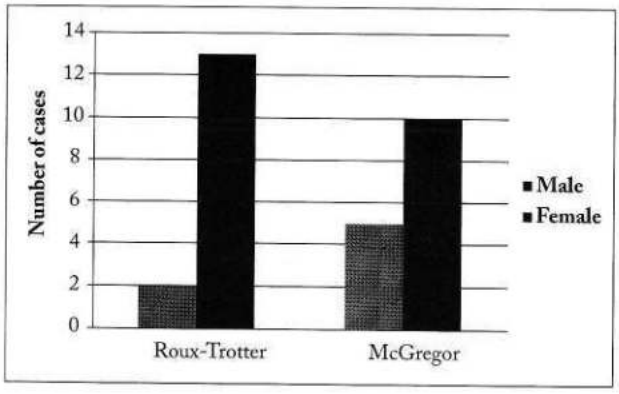

Figure 3.3 descries the distribution of the surgical incisions in the subjects.

Table IV : 3.4 Comparison of aesthetic outcome 3.1 Evaluation of aesthetic outcome of both incisions by Examiner

	Roux-Trotter			McGregor		
	E (%)	G (%)	P(%)	E (%)	G (%)	P(%)
VA	0	60	40	6.67	86.67	6.67
LSA	0	46.67	53.33	6.67	66.67	26.67

VA = Vermillion Appearance LSA = Lip Skin Appearance E = Excellent G = Good P = Poor % = Percentage

Table : 3.5 Evaluation of functional outcome of both incisions by examiner

	Roux-Trotter			McGregor		
	E (%)	G (%)	P (%)	E (%)	G (%)	P (%)
LM	13.33	46.67	40	6.67	66.67	26.67
LS	13.33	60	26.67	6.67	46.67	46.67
OC	13.33	66.67	20	6.67	73.33	20

LM = Lip Movement LS = Lip Sensation OC = Oral continence

Discussion

To achieve the best postoperative functional and aesthetic results after a lip-splitting approach, adherence to the basic surgical principles and correct closure of the incision are critical. This includes suturing in layers and careful approximation of previously determined skin points. Special attention should also be paid to proper alignment of the vermilion border, which is an especially prominent aesthetic unit. In present study 30 patients had been evaluated post-operatively for 3rd and 6th post-operative week period. Age ranges of the patients were from 12 years to 75 years and highest percentage (32%) was from age group 41 to 50. Female patients were 23 (77%) and male patients were 7 (23%). 15 patients were selected for McGregor incision and 15 patients were selected for Roux-Trotter incision. Among both incision group female patients were higher than male patients. Roux-Trotter incision were used in 15 patients and showed comparatively poor results than McGregor aesthetically. Rassekh et al reported that straight scars are more prone to clinically significant contracture.[6] In examiner's evaluation, Roux-trotter incision showed poor aesthetic results. It showed 40% and 53.33% poor results in terms of Vermillion appearance and lip skin appearance respectively. That

was presence of vermillion notching and straight line scar contracture. Rapidis et al used Roux-trotter incision in 15 patients and showed 23% poor result in vermillion appearance and 53.85%% poor result in lip skin appearance[7]. Satoshi et al reported that Roux-trotter incision divides chin pad contour, resulting in unsightly chin[8]. To prevent chin pad division the author used chin contour incision (McGregor modification) in 46 patients and found not a single case of chin pad division[8]. McGregor and Mc-Donald, Hayter et al[9] and Rassekh et al have proposed modifications, by breaking the incision line to better conform to the anatomic contours of the region and thus causing less muscle fiber disruption and scar contracture and reported better aesthetic result. McGregor modification avoids cutting through the chin pad.

In this study McGregor incision were used in 15 patients & showed better aesthetic result. In examiner's evaluation only 6.67% poor results were showed in terms of vermillion appearance & 26.67% poor results in lip skin appearance. Rapidis et al used McGregor incision in 15 patients and showed 10.53% poor results in vermillion appearance & 31.58% poor results in lip skin appearance. So this study reflects the almost same result.Roux-trotter lip-splitting incisions have the advantage of avoiding injury to branches of the mental nerve or the marginal mandibular branch of the facial nerve. Rassekh et al reported reduced risk of functional deficiencies in Roux-trotter incision.In the study Roux-Trotter incision showed 40% poor results in terms of lip movement in examiner's evaluation. Rapidis et al showed 38.46% poor results in lip movement and explained the cause due to reduced lip mobility secondary to pronounced scar contracture because it disrupts many muscle fibers, most notably those of the orbicularis oris muscle. In present study 26.67% poor results were found in terms of lip sensation in Roux-trotter incision in examiner's evaluation. Though the incision is functionally safe the cause of poor sensation was due to surgical resection of tumour. As in most surgeries, partial mandibulectomy were needed causing damage to mental nerve.

In McGregor incision 26.67% poor results were found in terms of lip movement and 46.67% poor results were found in terms lip sensation. It became apparent that a lip-splitting incision that carefully follows the anatomic contour of the lower lip and chin stays close to the midline to avoid nerve injury gave satisfactorily functional results. Gooris et al. described the versatility of lip-splitting incisions (McGregor 1983) highlighted the excellent access provided with this approach[10]. Our study noted that the functional aspect also could be improved with modifications.

Oral continence depended on the surgical technique. Oral incontinence in patients having ablative surgery is not attributed only to the lip-splitting incision but also could be the result of other factors: impaired lip motility caused by scarring, loss of facial nerve function and loss of lip support caused by removal of teeth and underlying bony structures. The findings of the study by Rapidis et al also highlighted this. Oral continence results were almost same in both incisions in present study. Poor results were 20% in both McGregor and Roux-Trotter incisions. Meticulous suturing of previously determined skin points holds the key for good results as per the findings of our study. While evaluating the results of the study we assessed the number of poor results. This enabled this study to critically analyze the incisions. The evaluation of vermilion appearance and lip sensation revealed that Roux-trotter had the poor results when evaluated by both examiner and the patient. McGregor had the good result.

Conclusion

This study shows that the modifications provide good cosmetic results apart from giving good functional results and adequate three dimensional tumor clearances. Several other modifications proposed have not stood the test of time. The lower lip-splitting incision will in all probability continue to be the surgical approach of choice for surgeons in the coming years.The McGregor incision is the better option between the two lip-splitting incisions studied. The Hayter et al modification of McGregor incision has been proposed as an improvement of the McGregor incision. This incision needs to be studied further. The aim is to constantly evolve new techniques so that the ultimate goal of patient care and benefit can be achieved.

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ORIGINAL ARTICLE

The Osmani Medical Teachers Association Journal Volume 17 Number 2

Association between Serum level of vit-D & lipid profile in type 2 diabetic patients.

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Abstract

Vitamin D deficiency is increasingly recognized as a global problem and it has been estimated that nearly a billion people have either vitamin D deficiency or insufficiency. This could be a potential risk factor for the metabolic syndrome type 2 diabetes and coronary heart disease. A case control study was done to see the association between vitamin D & lipid profile in type II diabetes mellitus in the dept. of biochemistry JRRMC. Out of 109 subjects number of diabetic patients were 45(41.28%) and non diabetic patients were 64(58.71%). Among diabetic patients 28.88% was vitamin D deficient & 35.93% deficit in non diabetic patient. There was an inverse correlation between vitamin D and total cholesterol and low density lipoprotein and it was statistically not significant. So, more interventional studies are needed to confirm the relationship between serum concentration of vitamin D & lipid profile in patients with type 2 diabetes.

[OMTAJ 2018; 17 (2)]

Introduction

Vitamin D is a group of fat soluble secosteroids playing major role in absorbing calcium, magnesium and phosphate. Vitamin D deficiency may affect glucose homeostasis.[1] Over the past decade, vitamin D has attracted substantial interest toward extraskeletal outcomes in various disease conditions, including diabetes .Vitamin D deficiency is highly prevalent in patients with type 2 diabetes. Several potential mechanisms involving vitamin D might affect glycemic control in patients with type 2 diabetes. Most cells, including the pancreatic B cells, contain the vitamin D receptor, and most of them also have the capability to produce the biologically active 1,25 dihydroxy vitamin D(1,25(OH)2D),which allow intracrine and paracrine functions.[2] It is now believed that vitamin D can protect against multiple sclerosis, type-1 diabetes mellitus and cancer.

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It is now believed that vitamin D can protect against multiple sclerosis, type 1 diabetes mellitus and cancer. Among adults low levels of vitamin D have been shown to be associated with increased risks of abesity, hypertension, glucose intolerance, type 2 diabetes mellitus and cardiovascular disease.[3] Vitamin D deficiency is increasingly recognized as a global problem and it has been estimated that nearly 1 billion people have either vitamin D deficiency or insufficiency. Possible explanations include lack of adequate sun exposure in urban areas, lack of intake of fortified foods and obesity.[4]

Vitamin D deficiency has been reported to be more prevalent among T2DM patients(63.5%, mean value 17.1 ng/ml,p,0.05) than patients with type 1 diabetes mellitus(36%, mean value 23.6ng/ml p,0.05).Vitamin D deficiency has also been reported to be more common among south Asians with the T2DM living in the Uk compared with the control group, which consisted of subjects without T2DM (83 vs 70%).[5] It is known that IR is associated with a specific lipid pattern, the so called lipid triad characterized by increased levels of triglycerides (TG),low high density lipoprotein cholesterol(HDL-C) and increased small dense low density lipoprotein cholesterol (LDL-C) which is associated with increased atherogenic risk. Vitamin D deficiency is associated with this lipid pattern. this link could be mediated by IR; alternatively, it is possible that vitamin D directly affects lipid metabolism by interfering with the activity of different enzymes as suggested by some observations in vitro. To date a direct effect of vitamin D deficiency on atherogenic dyslipidemia is still debated being supported by some studies but only modestly confirmed by other authors.[6,13]

Material and Methods

This cross sectional prospective study was conducted in Jalalabad Ragib Rabeya medical college & hospital over a period of 1 year. The study procedure was explained to the patients who volunteered & full filled the eligibility criteria. Informed consent was taken from the subjects before starting the study. For the assessment of all the required parameter of the study 10ml of blood was collected after a fasting period of 12 hrs from both the groups (diabetic & non diabetics patient) & the

following test were assessed FBG, Se 25(OH) D level, Lipid profile-TG, Cholesterol ,HDL, LDL. Total 109 patients were included in this study (45 diabetic & 64 non diabetic). Patient with impaired fasting glucose or IGT, Type 1 diabetics, subjects taking vitamin D supplementation or pregnant and nursing mother were excluded from the study. A brief history regarded age sex smoking habit blood pressure, diet, body mass index, waist circumference was noted down. Data for the study subjects were expressed as mean± SD or n%. Students t test was used for comparison of parameters in two groups Pearson correlation was done between vitamin D & biochemical parameter

Results

25(OH)D was measured in a total of 109 with a mean age 52.80 (±14.14) in the diabetic patients and 47.74 (±14.37) in the non diabetic patients. Among the participants 55.56% were male 44.44% female in diabetic and 44& male & 56% female in non diabetic group.

Table I: Demographic data and laboratory results in diabetic and non- diabetic patients

Parameters	Diabetics(n-45)	Non-diabetics(n-64)	P Value
Age	52.80(14.14)	47.74(14.14)	.070
Female	20(44.44%)	36(56%)	.774
Male	25(55.56%)	28(44%)	
Fasting Blood Glucose(mg/dl)	10.06(±87)	6.60(±14.14)	.001
Total Cholesterol(mg/dl)	173.48(±46..86)	165.33(±46.86)	.370
Serum Triglycerides(mg/dl)	234.87(±29.7)	167.67(±10.5)	.099
HDL Cholesterol(mg/dl)	34.87(±9.13)	35.13(±1.0)	.891
LDL Cholesterol(mg/dl)	118.51(±39.36)	126.31(±49.73)	.383
N-HDL(mg/dl)	130.47(±7.88)	138.20(±48.53)	.412
BMI(Kg/m^2)	30.52. (±4.97)	30.32(±4.44)	.862
Vitamin D (ng/dl	31.37(±19.48)	26.59 (±13.41)	.132

Level of 25(OH) D as assessed in 109 patients showed that more number of patients in the non diabetic group were vitamin D deficient as compared to diabetic group.

Table :II Vitamin D levels in diabetic and non diabetic patients.

Vitamin D level (ng/dl	Diabetic n=45(45%)	Non Diabetic n=64(%)
<20(deficient)	13(28.88)	23(35.93)
21-29(insufficient)	15(33.33)	23.(35.93)
21-29(insufficient)	15(33.33)	23.(35.93)
>30(sufficient)	17(37.77)	18.(28.12)

Analyses were performed to assess the impact of vitamin D status on T2D and related metabolic trait P<0.05 was considered as significant.

Table- III: Correlation between vitamin D and biochemical parameters

Biochemical Parameter	Pearson's correlation coefficient (r) between vitamin D	
	Diabetic (n45)	Non diabetic (n64)
Fasting Blood Glucose	-153	.123
P value	.316	.332
Total Cholesterol	-.190	-.178
P Value	.211	.160
Serum Triglycerides	-.099	-.240
P Value	.516	-.056
HDL Cholesterol	.060	.05
P Value	.697	.655
LDL Cholesterol	-.153	.071
P Value	.317	.576
Non-HDL Cholesterol	.175	-.183
P Value	.251	.148

Discussion

In this cross sectional study our aim was to evaluate the relationship between vitamin D & lipid profile among diabetics & non diabetics patients. In our study, we found vitamin D deficiency was 28.88% sufficiency was 37.77 & insufficiency was 33.33% in patients with type 2 diabetic. On the other hand vitamin D in non diabetic was observed 35.95%, sufficiency 28.12% & insufficiency was 35.93%.Thus more participant in non diabetic groups were deficient in vitamin D, which is similar to the study conducted by Ashish H bajaj et all in 2003.[7]

In contrary, to the result in other study which showed that out of the total 1765 participants the T2D cases (50.2% had a significantly higher prevalence of vitamin D deficiency (83.5%) when couponed to non diabetic patients(68%).[8] There was an inverse correlation between 25(OH) D and fasting blood sugar, Se TG, HDL, However the values were not statistically significant which is similar to the finding of the study conducted by Braun et all in 2012.[9] In our study there was an inverse correlation between vitamin D and lipid

profile & statistically no significant difference was found between vitamin D & lipid profile. Our study also shows that diabetic patient had higher levels of total cholesterol, Tg & LDL as componed to the non diabetics group. This coincides with the finding of a study conducted by simonen et all in 2011.[10] A negative correlation was found between vitamin D levels & blood sugar levels more number of diabetic patient had higher level of vitamin D.[11] Gary John & colleagues conducted a study on 170 UK Bangladeshi adult (69 men &101Women) non diabetic patients and there was no correlationship was observed between vitamin D & TG or HDL cholesterol.[12] Our study shows no relationship between vitamin D deficiency & lipid profile among diabetic & non diabetic patients. This may be due to comparitively small population size, and the result vary with an increase in sample size. Another limitation regarding information about the health of non diabetic patients, sun exposure per week, whole or partial body exposure. Season time of the day, dress code could not accurately obtained. If the study was extended further a higher number of subjects could be analyzed along with seasonal data for Se 25(OH) D3 sampling.

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ORIGINAL ARTICLE

The Osmani Medical Teachers Association Journal Volume 17 Number 2

Comparative study of the incidence of post dural puncture headache in caesarean section under spinal anaesthesia by 25G and 27G Quincke spinal needle.

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Abstract

Post Dural Puncture Headache (PDPH) is a well known iatrogenic complication of spinal anaesthesia due to dural puncture which is depending on size of the needle. The objective of this study is to compare the incidence & frequency of PDPH with 25G and 27G quincke spinal needle. 100 patients undergoing caesarean section under spinal anaesthesia were allocated into two groups. 25G and 27G quincke spinal needle were used for spinal anaesthesia in group Q25G (50 patients) and group Q27G (50 patients) respectively. All patients were blinded to the size of needle being utilized. 4 patients in group Q25G had developed PDPH. But there was no single case of PDPH in group Q27G. So 27G Quincke spinal needle is the better option to reduce the incidence of PDPH in caesarean section under spinal anaesthesia.

[OMTAJ 2018; 17 (2)]

Introduction

Caesarean section is the commonest surgical procedure in obstetric care. Aim of this choice is decreasing the maternal mortality as well as good healthy baby. But anaesthesia related complications accounted for 5.2% of maternal deaths[1]. Fatality risk is 16 times more during general anaesthesia than regional anaesthesia[2]. In comparison with general anaesthesia, regional technique specifically sub-arachnoid block is the most preferable, effective, affordable, flexible technique for caesarean section[3]. It has no depressant action like parenteral & inhalational anaesthesia. The procedure of anaesthesia is simple, keeps the mother to remain awake, avoid the complications of airway manipulation, rapid onset of anaesthesia, complete muscle relaxation, adequate postoperative analgesia & requires minimum postoperative care [4]. All surgical procedures have some drawback. In spinal anaesthesia, Post-Dural Puncture Headache (PDPH) is the well-known iatrogenic complication which results from puncture of the duramater. PDPH is defined as; Searing and spreading like hot metal, involving the back and front of the head, and spreading to the neck and shoulders, sometimes involving neck stiffness. It is exacerbated by movement, and sitting or standing, and relieved to some degree by lying down. Nausea, vomiting, pain in arms and legs, hearing loss, tinnitus, vertigo, dizziness and paraesthesia of the scalp are common. Incidence of PDPH ranges from 0-30% as reported by Zeger et al[5] and 0-37% as reported by Shutt et al[6]. German surgeon, Karl August Bier gained first-hand experience of the disabling headache related to dural puncture[7].

He correctly deduced that the headache was related to excessive loss of cerebrospinal fluid[8]. Ninety per cent of headaches occur within 3 days of the procedure[9]. According to the Global literature on PDPH, factors responsible for PDPH are age, sex, pregnancy, previous history of PDPH, needle size, needle tip shape, bevel orientation to the dural fibers, number of lumbar puncture attempts, midline versus lateral approach of lumber puncture, type of local anaesthetic solution and clinical experience of the operator[10,11]. Among them needle related factors can be modified by an anaesthesiologist. Twenty nine or finer gauge spinal needles are technically more difficult to use and associate with a high failure rate while 25G, 26G, 27G needles represent the adequate the needle size for spinal anaesthesia[12]. The aim of our study is to compare the incidence & frequency of PDPH by using 25G & 27G Quincke type spinal needle for spinal anaesthesia in patients undergoing cesarean section.

Material and Methods

It was a prospective, interventional, randomized, double-blinded and comparative study done in Royal Hospital & Research Centre Ltd. Sylhet from September 2017 to February 2018. After informed written consent 100 patients were allocated for the study. ASA grade I or II with normal coagulation profiles, age between 19-40 years, weight 40-85 kg, height 1.37-1.68 m. were enrolled in the study. ASA grade III and above, patient refusal,

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contraindication to neuro-axial block, pre-existing neurological disease, primary headache disorders (e.g., migraine), sinusitis, eclampsia, cardiac and respiratory failure, non-co-operative patients, allergy to local anaesthetic drugs, mental disturbance were excluded from the study. The patients were randomly divided into 2 groups; group Q-25and group Q-27.Patients in the Group Q-25 (n = 50) received spinal anesthesia via 25-G Quincke's spinal needle and those in the Group Q-27 (n = 50) via 27-G Quincke's spinal needle. Patients of both group received 12.5ml 0.5% hyperbaric bupivacaine for spinal anaesthesia. Before surgery, patients were confirmed with either adequate fasting or not. Their vital signs like blood pressure, pulse rate, respiratory rate were monitored.

Secured peripheral venous accesses were ensured with 20 G intravenous (I/V) cannula. As preload 800ml intravenous Isotonic solution were mandatory for all patients as well as intra operative fluid were maintained according to need of the patient by Isotonic solution. Quincke's spinal needle was introduced through L2-L3or L3-L4space in sitting position with keeping the bevel part laterally. Sub-arachnoid space was confirmed by free flow of cerebro-spinal fluid (CSF). Then direction of the needle aperture made upwards before injecting local anaesthetic. Any backward movement of the needle followed by redirection was classified as a further attempt. Immediate after injecting spinal drugs, all patients were placed in supine position. Heart rate (HR), systolic blood pressure (SBP), diastolic blood pressure (DBP), mean arterial pressure (MAP), oxygen saturation were recorded every 5minutes interval. Fall of SBP>20% of baseline or <90mm of Hg was considered hypotension and managed with Isotonic solution bolus (200ml) and/or injectable ephedrine 5mg intravenous as needed. Pulse rate <50 beats/minute was identified as bradycardia and treated with injectable atropine. Sensory block was assessed bilaterally by pin prick method along mid-clavicular line until complete loss of cutaneous sensation upto T6 level. Two segments regression times were also noted by pin prick method.

Motor block was assessed by Bromage scale as follows: grade 0: full flexion of hips, knees and feet possible, grade 1: just able to flex knees but full flexion of feet possible, grade 2: unable to flex knees but some flexion of feet possible and grade 3: unable to move legs and feet. The incidences of complication like hypotension, bradycardia, nausea, vomiting, shivering, sedation, respiratory depression were recorded. For first 24hrs after operation, all patients were advised to complete bed rest. Lying position was suggested rather than sitting during the bed rest to minimize the risk of PDPH. Postoperatively every patient was visited 6, 24, 36, 48 & 72hrs to check for the presence or absence of PDPH. The PDPH was initially treated conservatively with bed rest, hydration, and oral analgesic. If PDPH persists more than 24hrs with same intensity proposal management was epidural blood patch (EBP). On 3rd postoperative day all patients were discharged after the counseling of PDPH with its incidence & primary management. All the patients received a phone call after 1week and were questioned about possible delayed symptoms. Data were analyzed by the software SPSS for windows version 17. Table and figures were drawn by using microsoft word and excel. Continuous variables were presented as Mean ± SD (standard deviation). Categorical variables were presented as number of cases and percentages.

Results

In this study 100 patients were allocated. Among them 50 patients were in each group. Table - 1 shows the demographic profiles of both groups. No difference were found in respect of age, BMI, ASA grading. Spinal puncture attempts are shown in Table 2. Spinal block was established in a single attempt in 45 patients (90%) in Group Q25 G and 42 patients (94%) in Group Q_27G. No statistical difference was found between the two groups in respect to this variable. Table 3 shows the incidence of PDPH. The incidences of PDPH were 8% and 0% in the Groups Q_25G and Q_27G respectively. No statistical difference was found between the two groups.

Table I: Demographic profile (n-100)

Variable	Group Q_25G Mean ± SD	Group Q_27G Mean ± SD
Age	26.56± 4.54	25.98± 4.55
BMI	24.65± 3.92	24.05± 3.16
ASA	32:8	36:4

Table II: Spinal puncture attempts (n-100)

No of puncture	Group Q_25G	Group Q_27G
1	45(90%)	42(94%)
2	04(8%)	06(12%)
≥	01(2%)	02(4%)

Table III: Incidence of PDPH (n-100)

PDPH	Group Q25G	Group Q27G
Absent	46(92%)	50(100%)
Present	04(8%)	00

Discussion

CSF loss through the dural puncture hole and failure of choroid plexus to secrete sufficient fluid decrease the CSF pressure resulting PDPH. Moreover, the negative pressure in the epidural space may draw CSF from subarachnoid space. This leads to CSF hypotension, which in turn leads to intracranial venous dilatation resulting in an increase in brain volume in the upright position. Venous dilation and compensatory increase in brain volume will exert traction and stimulate pain sensitive structures like dural vessels, basal dura and tentorium cerebelli, causing PDPH. The larger the hole in dura mater, the more will be the leakage of CSF and the longer the time required for repair

Frequency and severity of PDPH are highest in young age parturient. The incidence of PDPH is grossly reduced after the introduction of thinner spinal needles[13,14,15]. From different study, the incidence of PDPH with 25G Quincke spinal needle ranges from 4%[16] to 40%[17] whereas with 27G Quincke spinal needle ranges from 1.1% to 12.8%[18]. In our study, frequency of PDPH with 25G Quincke spinal needle is 8%, which correlates with mentioned studies. However, we found 0% incidence of PDPH with 27G Quincke spinal needle. It corresponds with the study of Muhammad et al[19] who also mentioned o% incidence with 27G Quincke spinal needle. Sohail et al.[20] compared between 25G and 27G Quincke needles in elective CS and found PDPH incidence of 8.33% in 25G group and 2.04% in 27G group. In another study by Syed et al[21], the incidence of PDPH was 23.68% in Group Q25G and 5.4% in Group Q27G. (6). Therefore, current study clearly demonstrated a reduction in frequency of PDPH when 27G Quincke spinal needle was used as compared to 25G Quincke spinal needles. Our results can be compared with the study of Shaikh et al.[22] and Muhammed et al.[19] as the incidence of PDPH in our setting is similar to these studies. Our study is limited by the small sample size.

Conclusion

27G Quincke type spinal needle can be a better option than 25G Quincke type spinal needle to reduce the incidence and frequency of PDPH after spinal anaesthesia in patients undergoing cesarean section.

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ORIGINAL ARTICLE

The Osmani Medical Teachers Association Journal Volume 17 Number 2

Relationship of Serum Zinc and Copper with Iron Status in Iron deficient Anemic Adolescents

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Abstract

The present study was carried out to observe the relationship of serum zinc and copper with iron status in iron deficient anemic adolescents. For this purpose, a total number of 60 subjects of both sexes with age ranged from 11-18 years were selected of whom 30 were iron deficient adolescents and 30 were apparently healthy. Iron parameters was positively correlated with serum zinc and negatively correlated with serum copper in iron deficient anemic adolescents. From this study it may be concluded that deficiency of iron usually does not occur and it is usually associated with hypozincemia and hypercupremia. Therefore, this study suggests that supplementation of zinc along with iron for the correction of iron deficiency anemia especially in adolescents when their demand is more. Adolescence; Zinc; Copper; Iron.

[OMTAJ 2018; 17 (2)]

Introduction

Iron deficiency anemia (IDA) is the most common type of anemia. According to UNICEF report, two billion people suffer from anemia worldwide and most of them are affected with deficiency of iron, especially in underdeveloped and developing countries[1]. No single laboratory test can be used specifically to indicate iron deficiency [2]. Therefore, to determine iron status as well as the presence of anemia with iron deficiency serum iron, serum ferritin, transferrin saturation, total iron binding capacity have to be done and the changes of all these values depends on the degree of severity of anemia[3]. When iron status is inadequate serum iron, serum ferritin, transferrin saturation are decreased but the total iron binding capacity of the serum is increased [3]. Iron status also influences serum levels of some other trace elements like copper and zinc [4].

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Changes in micronutrient levels like zinc and copper have important role in the development of iron deficiency [5]. Decreased zinc and increased serum copper levels have also been reported in this group of anemic patients[6]. Zinc deficiency is associated with iron deficiency anemia[6,7,8]. This deficiency of zinc may occur due to inadequate dietary intake and decreased intestinal absorption[6]. An increased concentration of copper is associated with iron deficiency anemia. This increased copper concentration may occur due to excessive gastrointestinal copper absorption as grain products are major source of dietary copper[6].

All these evidences support the presence of a relationship of serum zinc and copper with iron status. In Bangladesh there is a few data regarding iron status are available in anemic patients. Moreover, along with iron data regarding serum zinc and copper are not available in iron deficiency anemia. Therefore, the present study has been undertaken to observe serum iron as well as serum zinc and copper level in iron deficient adolescents in order to find out their status and also the relationships among them. It is expected that the results would give a guideline to the physicians to adopt appropriate measure for the management of iron deficiency anemic patients.

Material and Methods

The present observational study was carried out in department of Physiology, BSMMU, Dhaka from 1st January to 31st December, 2007. In this study, a total number of 60 subjects with the age range of 11 to 18 years of both sexes were included, of whom 30 were apparently healthy and 30 were iron deficient anemic adolescents. All the subjects were selected randomly from resident of different area of Dhaka city and belonged to lower middle socioeconomic status. On the basis of Hb concentration [3] and serum ferritin level (SF)[9] the subjects were divided into control A and study group B. They were further subdivided into A_1=15 male(Hb>13g/dl, SF>30?g/L), A_2=15 female (Hb>11.5g/dl, SF>22?g/L) and B1 =15 male(Hb<13g/dl, SF<30ug/L), B2 =15 female(Hb<11.5g/dl, SF<22ug/L).

The subjects with history of blood transfusion and iron therapy during the last three month, any history of kidney diseases, liver diseases were excluded from the study. Serum zinc and copper levels were measured by

spectrophotometric method. . Iron status was assessed by measuring serum ferritin, serum iron, TIBC and also by calculating transferrin saturation. The statistical analysis was done by using SPSS programme, version-12. p value <0.05 was considered as significant. The comparison between the groups were calculated by unpaired Student's 't' test.

Results

Mean (±SD) serum ferritin, serum iron, total iron binding capacity (TIBC) and transferrin saturation (TS) are presented in Table I. Mean serum ferritin, serum iron level and transferrin saturation were significantly ($p<0.001$) lower in both the iron deficient group B_1 and B_2 in comparison to those of healthy control group A_1 and A_2. Mean total iron binding capacity was significantly ($p<0.001$) higher in both iron deficient group B_1 and B_2 than those of control group A_1 vs A_2.

Table I: Serum ferritin, Serum iron, Total iron binding capacity (TIBC) and Trransferin saturation in different groups (n=60)

Sub groups	Serum ferritin (mg/L)	Serum iron (mg/dl)	TIBC (mg/dl)	Transferrin saturation(%)
A1 (n=15)	64.76 ±25.52 (38.52-128.00)	81.33±12.94 (61-104)	285.73±34.45 (253-367)	28.01±5.51 (19.52-6.07)
A2 (n=15)	56.43±27.74 (24.86-114.30)	67.73±13.32 (48-97)	298.26±33.72 (251-367)	23.11±5.99 (17.44-8.64)
B1 (n=15)	14.76±5.96*** (5.69-24.30)	38.86±9.28*** (21-51)	449.13±26.87*** (407-501)	8.69±2.19*** (4.36-1.72)
B2 (n=15)	13.66±3.66*** (6.96-19.27)	28.93±4.90*** (18-36)	456.13±30.64*** (415-520)	6.37±1.18*** (3.72-7.92)

Figures in parentheses indicate ranges. n = Total number of subjects. ***= Significant at p<0.001

Mean (SD) serum zinc and copper levels are presented in Table II. Mean serum zinc level was significantly ($p<0.01$) lower and serum copper level was significantly ($p<0.01$) higher in both the iron deficient group B_1 and B_2 in comparison to those of healthy control group.

Table II: Serum Zinc and Copper levels in different groups (n = 60)

Sub groups	Zinc (mg/dl)	Copper (mg/dl)
A1 (n=15)	107.46±14.03 (80-126)	108.60±20.92 (82-139)
A2 (n=15)	102.80±16.84 (80-125)	118.13±15.57 (82-139)
B1 (n-15)	80.80±14.20** (60-107)	140.53±18.63** (97-165)
B2 (n=15)	80.26±18.23** (57-120)	150.06±22.59** (106-191)

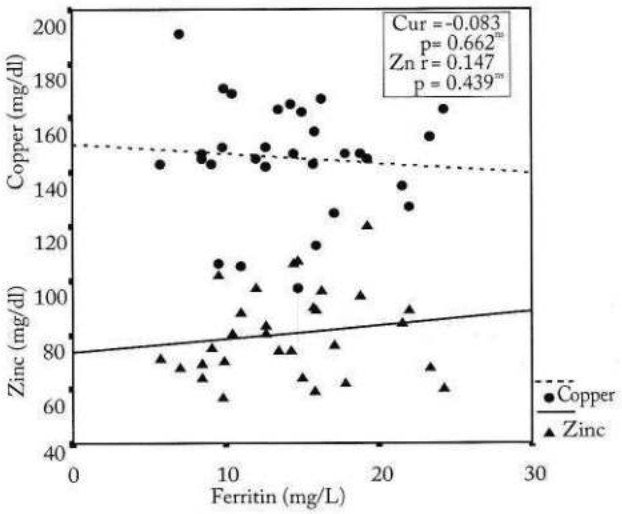
Figures in parentheses indicate ranges. n = Total number of subjects. ** = Significant at p< 0.01

Table III: Relationships of serum zinc and copper with hematological parameters (n=30)

Parameters	Zinc		Copper	
	r	p	r	p
Hb	0.485	0.007**	-0.366	0.047*
MCV	0.199	0.291	-0.043	0.821
PCV	0.467	0.009**	-0.180	0.342

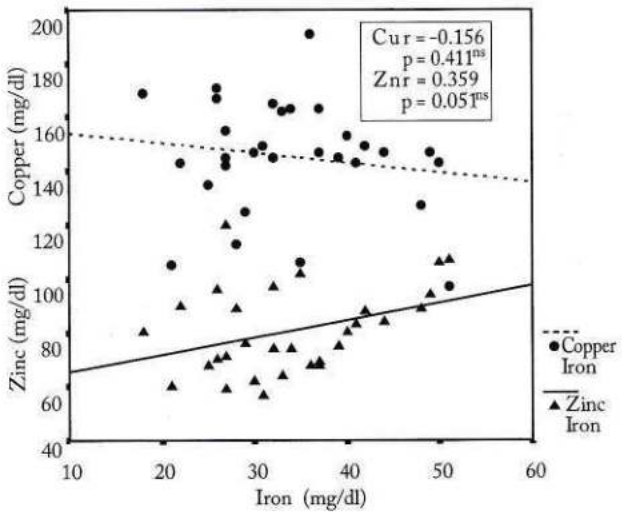
Figures in parentheses indicate ranges. **= Significant at p<0.01, *= Significant at p<0.05.

Figure I: Relationship of serum zinc and copper with ferritin in iron deficient adolescents (n=30)



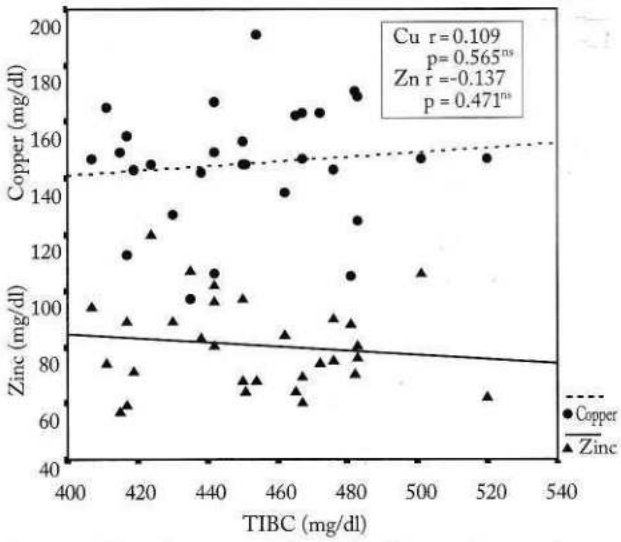
Statistical analysis was done by Pearson's correlation coefficient test. ns = Not significant.

Figure II: Relationship of serum zinc and copper with serum iron in iron deficient adolescents (n=30)



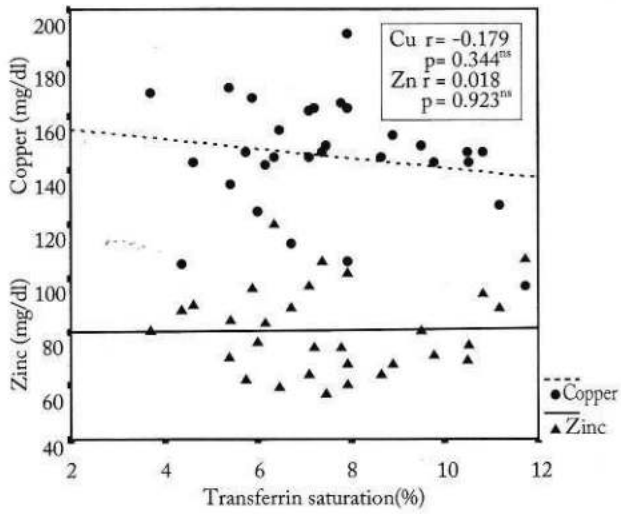
Statistical analysis was done by Pearson's correlation coefficient test. ns = Not significant.

Figure III: Relationship of serum zinc and copper with total iron binding capacity in iron deficient adolescents (n=30)



Statistical analysis was done by Pearson's correlation coefficient test. ns = Not significant.

Figure IV: Relationship of serum zinc and copper with transferrin saturation in iron deficient adolescents (n=30)



Statistical analysis was done by Pearson's correlation coefficient test. ns = Not significant

Discussion

In the present study, serum ferritin, serum iron level and transferrin saturation were significantly ($p<0.001$) lower in both the groups of iron deficient adolescents in comparison to their respective healthy control (non deficient group) These findings are consistent to other investigators of different countries [6,11,12]. Serum TIBC was significantly ($p<0.001$) higher in iron deficient adolescents of both sexes in comparison to their respective healthy control. Similar higher level of total iron binding capacity was also reported by Ece et al.[6]

On the other hand, serum zinc level was significantly ($p<0.01$) lower and serum copper level was significantly ($p<0.01$) higher in both sexes of iron deficient adolescents in comparison to their respective healthy control. Similar observations were also made by others [6,8,12].

In this study, serum zinc level was positively correlated with serum ferritin, serum iron, transferrin saturation and was negatively correlated with total iron binding capacity. On the other hand, serum copper level was negatively correlated with serum ferritin, serum iron, transferrin saturation and was positively correlated with total iron binding capacity. But the relationships among all these values were not statistically significant. These findings are in consistent with others [4,6,12].

In adolescents, inadequate food intake and iron absorption, increased body need due to rapid growth, parasitic infestations and chronic blood loss due to any cause may lead to iron deficiency [6, 13]. It has again been suggested that decreased iron absorption may result from dietary iron deficiency or from high fiber content of diet [6]. Flesh foods are rich source of readily available haem iron, whereas cereals are strong inhibitor of iron absorption[14]. It has also been suggested that lower zinc intake may lead to lower ferritin level. Therefore, serum ferritin level may also be influenced by zinc status [15].

Grain products, having rich fiber and phytate contents are known to decrease the availability of zinc by decreasing its absorption[2]. Again, it has also been suggested that increased production of zinc protoporphyrin may lead to low serum zinc concentration in iron deficiency anemia [16]. Grain products are a major source of dietary copper which may lead to increased copper absorption and thereby may results in higher copper concentration in blood [6]. Some researcher suggested that iron and copper shares with the same metal transporter. Therefore, copper exhibits competitive antagonism with iron for uptake into enterocyte during in iron deficiency [4,17]. For this, iron parameters usually have positive correlation with serum zinc and negative correlation with serum copper in iron deficient adolescents [4].

Poor socio background of the study subjects indicates that the observed hypozincemia is most likely due to its low dietary intake as evidenced from history. Increased body demand during adolescence period is also likely to be an additional factor for this hypozincemia in the subjects of the present series. Moreover, low dietary intake of protein is also a contributory factor for hypozincemia in the study subjects.Therefore, this study revealed that deficiency of iron is an important cause of hypozincemia and

hypercupremia which may occur in adolescents. Positive correlation of serum zinc and negative correlation of serum copper with iron parameters are also in favour of the above findings. All these changes are most likely due to low dietary intake as well as low protein and high dietary content of grain because of poor socioeconomic background of the study subjects.

Conclusion

In this study deficiency of iron observed by lower levels of serum iron, serum ferritin, transferrin saturation with higher total iron binding capacity is associated with hypozincemia and hypercupremia in adolescents. All these changes are most likely due to low dietary intake as well as low protein, high dietary content of grain because of poor socioeconomic background of the study subjects. From this study it may be concluded that deficiency of iron alone usually does not occur and it is usually associated with hypozincemia and hypercupremia. Therefore, this study suggests that supplementation of iron along with zinc should be given to correct deficiency of iron especially in adolescents when their demand is more.

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ORIGINAL ARTICLE

The Osmani Medical Teachers Association Journal Volume 17 Number 2

Demography and Clinical types of acute stroke among 100 acute stroke patients with type 2 diabetics in DMCH.

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Abstract

Cerebrovascular disease is the third most common cause of death in high-income countries after cancers and ischemic heart disease, and the most common cause of severe physical disability.1 Ischemic stroke is the major cause among stroke patients worldwide and in Bangladesh also this statistics is not different. To observe demography and clinical types of acute stroke among 100 acute stroke patients with type 2 diabetes in DMCH. It was a hospital based cross sectional observational study in DMCH. Total 100 patients of acute stroke with type 2 diabetes were enrolled in this study by purposive sampling after written informed consent. The initial clinical diagnosis of stroke was done from history obtained from patient himself or his/her attendant and confirmed by CT/MRI of brain. Patients taking lipid lowering drugs, brain tumour, meningitis, viral encephalitis and/or metabolic encephalitis, hypothyroidism were excluded. A standard preformed questionnaire was designed and filled up for each patient. Collected data were checked, verified for consistency and edited for finalized result. Data cleaning, validation and analysis was performed using the SPSS/PC and graph and chart by MS excel. shows socio-demographic information of the study patients, it was observed that Male 82% and female 18%, majority of patients(71%) are in 51-70 years age group. Most of the patients 94.0% were married, 46(46.0%) patients had completed primary education, 33(33.0%) patients were self employed and 69(69.0%) patients were living in rural area. It was observed that 86(86.0%) patients had ischemic stroke and 14(14.0%) had hemorrhagic stroke. Stroke cases in Bangladesh have significantly increased in number over the past decades; and demographic patterns are gradually changing day by day. Demographic studies are helpful to plan and develop better service for the stroke survivors.

[OMTAJ 2018; 17 (2)]

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Introduction

Stroke may be defined as an acute, focal brain dysfunction due to vascular disease. Stroke is the most common clinical manifestation of cerebrovascular disease, and results in episodes of brain dysfunction due to focal ischemia or haemorrhage.[1] Understanding demographic characteristics of patients is necessary in order to assess patients' needs, to improve the quality of life of patients and their careers, and to develop new services for stroke survivors.[2] However, there are only a limited number of studies in developing countries which have investigated the demographic characteristics of stroke patients in hospitals.[3]

In Bangladesh, stroke has been ranked as the third leading cause of death after coronary heart disease and infectious diseases such as influenza and pneumonia. The mortality rate of stroke increased from 6·00% (in 2006) to 8·57%, (in 2011) with an age-adjusted mortality rate of 108·31 per 100 000 people (in 2011).[4] A study was conducted among 100 stroke patients admitted to CMCH between July 2001 and June 2003. Among the patients, 74% were males and 26% were females, with 61% suffering from ischemic stroke (IS) and 39% suffering from hemorrhagic stroke (HS).[5] With the increasing risk factors of stroke like Diabetes mellitus, Dyslipidemia, Hypertension etc. and changing of socio-economic status burden of stroke also increasing, but more study required to find out the proportion of different types of stroke and there relation with socio-demographic status. Hence, this hospital based observational study has been designed to explore the field of better evaluation of demography and clinical types in acute stroke patients so that it may provide a key to help in planning of health care services and necessary preventive actions in a community.

Materials and Methods

It was hospital based cross sectional observational study among 100 patients of acute stroke with type 2 diabetes who were admitted in Dhaka Medical College Hospital from April,2015 to October ,2015 (6 months).Criteria for inclusion in this study were. (1) Acute stroke patients, (2)Patients with type 2 diabetes mellitus, (3) Age more than 30 years, (4) With informed written consent. Exclusion criteria were: (1) Patient taking lipid

lowering drugs, (2) Patient with brain tumour, meningitis, viral encephalitis and or metabolic encephalitis, (3) patient with hypothyroidism and nephrotic syndrome. Clinical information including age, sex, socioeconomic status, blood sugar level, lipid profile and type of stroke were recorded for all subjects.

Data were collected by a predesigned proforma. Patient's information was obtained through using patient's information sheet. All Patients were informed about the nature of the study. Their informed written consent was taken in a consent form before collecting the data. Proper permission was taken from concerned department and local ethical committee

Statistical analyses were carried out by using the Statistical Package for Social Sciences version 16.0 for Windows (SPSS Inc., Chicago, Illinois, USA). The mean values were calculated for continuous variables. The quantitative observations were indicated by frequencies and percentages. Chi-Square test was used to analyze the categorical variables, shown with cross tabulation. P values <0.05 was considered as statistically significant.

Results

Table I: Distribution of the study patients by age and sex (n=100)

Age-Sex distribution	Number of patients	Percentage
Age (in years)		
31–40	2	2.0
41–50	18	18.0
51–70	71	71.0
71–80	9	9.0
Mean±SD(in years)	60.0 ±8.9	
Range (min-max)(in years)	35-80	
Sex		
Male	82	82.0
Female	18	18.0

Table I shows age and sex distribution of the study patients, it was observed that majority (71.0%) patients belong to age 51-70 years. The mean age was found 60.0±8.9 years with range from 35 to 80 years. Majority (82.0%) patients were male and 18(18.0%) patients were female. Male female ratio was 4.6:1.

Table II: Distribution of the study patients by socio-demographic information (n=100)

Socio-demographic information	Number of patients	Percentage
Marital status		
Married	94	94.0
Unmarried	6	6.0
Educational status		
Primary	46	46.0
Secondary	33	33.0
Higher secondary	12	12.0
Graduate	9	9.0
Occupational status		
Service holder	10	10.0
Self employed	33	33.0
Retired	23	23.0
Unemployed	34	34.0
Area of living		
Rural	69	69.0
Urban	31	31.0

Table II shows socio-demographic information of the study patients, it was observed that majority (94.0%) patients were married, 46(46.0%) patients had completed primary education, 33(33.0%) patients were self employed and 69(69.0%) patients were living in rural area.

Table III: Distribution of the study patients by type of stroke and radiological finding (n=100)

Type of stroke	Number of patients	Percentage
Ischemic	86	86.0
Hemorrhagic	14	14.0
Radiological finding		
CT scan of brain	97	97.0
MRI scan	3	3.0

Table III shows type of stroke of the patients. It was observed that 86(86.0%) patients had ischemic stroke and 14(14.0%) had hemorrhagic stroke. CT scan of brain was done in 97 cases and MRI scan done in 3 cases.

Discussion

Stroke is one of the foremost causes of morbidity, mortality and a socioeconomic challenge. This is particularly true for developing countries like Bangladesh, where health support system including the rehabilitation system is not within the reach of ordinary

people. It is crystal clear that, this devastating condition not only affects the patient but also their family.[6] In this present study it was observed that most (71.0%) of the patients having acute stroke in type 2 diabetics belongs to age 51-70 years and the mean age was found 60.0±8.9 years. In other study like Hossain et al5. and Iqbal et al.[6] Rahman et al.[7] found similar findings.

In our study it was observed that acute stroke in type 2 diabetics is predominant in male subject, where the present study was found male to female ratio was 4.6:1. Similar observations regarding male predominant also observed by Pandya et al.[8] Chowdhury et al.[9] and Hasan et al.[10] In this study male ratio much higher may be due to small sample size.

In this current study it was observed Male 82% and female 18%, majority of patients (71%) are in 51-70 years age group. Most of the patients (94.0%) were married, 46.0% had completed primary education and 33.0% were self employed. In our country Hossain et al.[5] reported that most of the patients were service holders (28%) which were followed by retired group 21%, literate group comprised of 63%. Hart et al.[11] had shown that men, who left full time education at the age of 16 years or below, had significant higher rate of stroke. But these studies contradicted with that of Ross[12] whose study revealed education level was inversely associated with fatal stroke. In occupational category, businessman (17%) in male population and house wife (16%) in female population were affected by this disease. This study showed that among the affect persons 79% were working force of our society, which indicates a serious impact on the families of the sufferers.

In this present study more than two third (69.0%) of the patients lived in rural area. Hossain et al.[5] done a study in Bangladesh and reported with respect to the demographic data, 54% and 46% lived in urban and rural areas, respectively. This indicated that incidence of stroke is common both in urban and rural population which was contradicted by the study of Bashar[13] which showed mainly urban preponderance. The reason might be that, the study was done in the hospitals of Dhaka, where mostly the urban population could avail the hospital facilities due to economic condition.

In this current study it was observed that ischemic stroke was more common, here 86.0% patients had ischemic stroke and 14.0% had hemorrhagic stroke. Similarly, Hossain et al.[5] found 61.0% suffering from ischaemic stroke (IS) and 39% suffering from hemorrhagic stroke (HS) in our country. This finding was almost similar with the study of Alam[14] done in Dhaka Medical College Hospital (DMCH) and similar findings with the study of Hayee et al.[15] which was also done in Dhaka where the incidence of IS was higher (83.89%). But the incidence of IS in Asian countries was respectively in Malaysia (33%) Thailand (30%), Korea (31%), Taiwan (31%).[16,17] One of the cause of high incidence of haemorrhagic stroke in those hospital based studies may be due to the acute admission is more related to haemorrhagic stroke.

Conclusion

With the increasing risk factors like Diabetes, Hypertension and lifestyle changes incidence of stroke is increasing day by day in our country and the adverse outcomes from these patients are also rising due to lack of study and less number of specialized hospitals in our country. This study was undertaken to observe the demography and clinical types of acute stroke among 100 acute stroke patients with type 2 diabetics in DMCH. Majority of the patients having acute stroke in type 2 diabetics belonged to 6^{th} decade, male predominant, married, low educational level a nd came from rural area. Ischemic stroke is more common in this study. Studies about demographic characteristics among stroke patients in our country are limited and it should be done among large scale of population which will be more informative for planning of healthcare services and take preventive actions in community.

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ORIGINAL ARTICLE

The Osmani Medical Teachers Association Journal Volume 17 Number 2

Clinical Profile and Serum Magnesium Levels before and after Supplementation of Magnesium in Severely Malnourished Children

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Abstract

Malnutrition is one of the important causes of under-five morbidity and mortality in developing countries including Bangladesh. Diets in populations, there are frequently deficient in macronutrients, micronutrients or both. Magnesium is recognized as a clinically important micronutrient. It is the most important intracellular cat-ion, plays an essential role in numerous cellular reactions such as membrane stabilization, nerve conduction, ion transport, and calcium channel activity. Magnesium depletion in malnourished children may remain asymptomatic or may produce symptoms such as anorexia, nausea, muscular weakness, lethargy, weight loss, tremors, athetoid movements, seizure and psychomotor changes. With these views, this study was conducted with the aim to observe clinical outcome and serum magnesium levels in severely malnourished children before and after magnesium supplementation. This hospital-based prospective study was carried out on 60 children having severe acute malnutrition (according to WHO) fulfilled the inclusion and exclusion criteria with age range of 6-59 months. In our study, Male predominance was found with a male-female ratio of 1.2:1. Clinical profile of studied children showed that diarrhea was found in 40 (60%) of children. It was improved in the children of both the groups but much improvement occurred in the children of Group II. Nausea/ vomiting was seen in 22 (73.3%) and 16 (53.3%) children respectively in Group I and Group II. After treatment, this was improved completely (100%) in Group II but only 76.7% was improved in Group I. This was statistically significant, P<0.01. Poor appetite was noted in 25 (83.3%) in Group I and 22 (73.3%) in Group II patients. But after treatment, appetite was improved significantly in magnesium supplemented group (P <0.01). In both the groups, majority of the studied patients showed irritability which was improved after treatment and magnesium supplemented group showed better improvement. The rate of weight gain (g/kg/day) was 1.significantly different in Group I and Group II which were 9.27±3.15 and 13.16±6.78 respectively and 'P' value < 0.01. Skin changes were found in small number of studied children with malnutrition. After treatment, it was improved in 100% cases in Group II and 93.3% case in Group I. Symmetrical edema was found in half of the children of both groups. This edema had been subsided and none of them showed any edema on day 14 of treatment in both groups. Skin changes were found in a small number of children. It was improved in all cases in group II and 93.3% in group I. The rate of weight gain was 9.27±3.15 gm/kg/day in group I and 13.16±6.78 gm/kg/day in group II. This difference was statistically significant. Mean serum magnesium level was 1.47 mg/dl in group I and 1.37 mg/dl in group II. On day-14 mean serum magnesium level was 1.52 mg/dl in group I and 2.03 mg/dl in group II. In conclusion, irritability, nausea/vomiting, diarrhea, infections, loss of appetite, bipedal edema and skin changes were most common clinical profile of malnutrition which was improved more significantly with magnesium supplementation in treatment.

[OMTAJ 2018; 17 (2)]

Introduction

Malnutrition continues to be a major public health problem throughout the developing world. Diets in populations there are frequently deficient in macronutrients (protein, carbohydrates, and fat leading to protein-energy malnutrition), micronutrients (electrolytes, minerals, and vitamins, leading to specific micronutrient deficiencies) or both. Malnutrition is one of the important causes of under-five morbidity and mortality in developing countries including Bangladesh. It is also an important underlying cause in two-thirds of the death from infectious diseases. Malnutrition increases one's susceptibility to and severity of infections and is thus a major component of illness and death from disease. The risk of death is directly correlated with the degree of malnutrition.[1] Two-thirds of under-five children are malnourished in Bangladesh.[2] The national child

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nutrition survey conducted in 2000, demonstrated that among the children of 6-71 months of age almost 49% were found stunted and nearly 12% wasted and 52% were under weighed.[3] It was found that among the South Asian countries (surveyed from 1990-2000), prevalence of wasting in Bangladesh was 11.6%.[3,4]

Protein-energy malnutrition usually manifests early in children between 6 months and 2 years of age and is associated with early weaning, delayed introduction of complementary foods, a low-protein diet and severe or frequent infections. Micronutrient deficiencies affect at least 2 billion people worldwide.[5] Out of important micronutrients magnesium is gaining recognition as a clinically important electrolyte. Magnesium is the fourth most abundant cat-ion in the body, behind sodium, potassium, and calcium and the third most common intracellular cat-ion.[6] Second only to potassium, magnesium is the most important intracellular cat-ion, plays an essential role in numerous cellular reaction[7,8] including oxidative phosphorylation, enzymatic reaction, nucleic acid metabolism, protein synthesis and others,[9] important for the generation of energy from ATP.[10] It has an important role in membrane stabilization, nerve conduction, ion transport, and calcium channel activity.

Magnesium deficiency may thus result in a variety of metabolic abnormalities and clinical consequences.[11] Of the body's magnesium, 30-40 percent is found in muscles and soft tissues, 1 percent is found in extra-cellular fluid (60% ionized, 15% complexed; 25% protein bound) and the remainder is in skeleton where it serves a reservoir because one third is exchangeable allowing movement to extra-cellular space.[5,6] Most intracellular magnesium is bound to proteins and other negatively charged molecules such as ATP; only about 25% is exchangeable and Mg ATP is in equilibrium with free magnesium ions .[6,10] The normal serum magnesium concentration or [Mg 2+] ranges between 0.75 and 0.95 mmol/L (1.7 -2.2 mg/dl, 1.5-1.9 mEq/L).[11]

Magnesium depletion depresses both cellular and extra-cellular potassium content.[5] Muscle potassium becomes depleted as magnesium deficiency develops and tissue repletion of potassium is virtually impossible unless magnesium status is restored to normal. Magnesium depletion in malnourished children may remain asymptomatic or may produce symptoms such as anorexia, nausea, muscular weakness, lethargy, weight loss, tremors, athetoid movement, seizure and psychomotor changes.[5,8] Susceptibility to the effects of magnesium deficiency rises when demands for magnesium increase markedly with the resumption of tissue growth during rehabilitation from general malnutrition.[8] The catch up growth associated with recovery from PEM is achieved only if magnesium supply is increased substantially,[8-12] as such magnesium is almost routinely given in the management of severe malnutrition.

The measurement of serum magnesium is a useful test to detect magnesium deficiency in routine clinical practice. Although magnesium status can be reliably assessed by balance studies, load tests, and muscle biopsy. These tests are difficult to perform and time consuming.[12] Trials of magnesium supplementation have been small and the results were inconclusive.[13] With this view, the aim and objective of this study is to observe clinical outcome and serum magnesium levels in severely malnourished children after magnesium supplementation.

Materials and Methods

This hospital-based prospective study was carried out on 60 children with aged range of 6-59 months. Children having severe acute malnutrion (according to WHO) fulfilled the inclusion criteria (Symmetrical edema, weight-for-height z-score <-3SD & <70% of NCHS median, height-for-age z-score <-3SD & <85% of NCHS median) and exclusion criteria (Age below 6 months and above 59 months, children having central nervous system or neuromuscular disorders) were included into this study. The places of study were the Department of Pediatrics, Dhaka Medical College Hospital (DMCH), Bangabandhu Sheikh Mujib Medical University (BSMMU), Ad-din Medical College Hospital, Dhaka and MAG Osmani Medical College Hospital, Sylhet. The study period was July, 2014 to June, 2016. Biochemical analysis was done at the Biochemistry Department of BSMMU and a renowned diagnostic centre in Sylhet.

Detailed history including birth history, feeding history, past and present infection, socio-economic status, maternal education of both the groups were taken. While taking treatment history especial emphasis was given on the history of taking proteins, any vitamin and minerals including magnesium before getting their admission in the respective hospitals. For taking history and to make clinical profile pre-tested questionnaire was used by the investigator himself. After admission of the patients in the hospitals and before starting treatment, one blood sample was drawn for the estimation of serum magnesium. Children were broadly divided into two groups (Group-I & Group-II) by simple random technique of lottery. Group-I consisted of 30 severely malnourished children whose weight for height z-score (WHZ) and height for age z-score (HAZ) were <-3 and managed with adequate protein calorie and multivitamin & minerals without magnesium supplementation.

Group-II, consisted of 30 severely malnourished children whose weight for height z-score (WHZ) and height for age z-score (HAZ) were also <-3 and managed with F-75, F-100 along with CMV (combined mineral vitamin) having adequate amount of magnesium.

One scoop of CMV contains 146 mg of magnesium along with other minerals and vitamins. One scoop of CMV was dissolved in 40 ml of water and then 20 ml of the prepared solution was added to each liter of F-75/F-100 formula. So, each 100 ml and 130 ml of F-75/F-100 formula contained 7.3 mg and 9.49 mg of magnesium respectively. Thus an average intake of magnesium was 7.3 mg/kg/day - 14.6 mg/kg/day (0.3-0.6 mmol/kg/day) throughout the initial 2 weeks of treatment. Both the groups were treated with routine antibiotics in adequate doses. On day-14 of admission, each patient of both the groups (I & II) was followed-up to observe the clinical response and the clinical findings were recorded on the follow-up sheet of the data collection form. A second sample of venous blood was also drawn on day-14 to estimate serum magnesium again.

Blood sample collection, separation and preservation

The patient and his/her attendants were given a detailed briefing about the purpose of the study. Informed written consent was received from parent or guardian. With all aseptic precaution 2 ml of venous blood was drawn on the day of admission before the treatment started. Immediately after collection the whole blood was kept in a plastic test tube in vertical position for at least 1-2 hours. After clotting the sample was centrifuged at 3000 rpm for 5-10 minutes on the same day. Supernatant clear serum was preserved at -350c in different vials till use for analysis.

Analytical procedure

Serum magnesium was determined by commercially available kits, using Colorimetric method in the Micro Flow-cell Photometer; AE-100F, serial No-102087074, ERMA INC, Tokyo, Japan.

Statistical Analysis

All the values were expressed as mean ± SD; Chi-square and paired & unpaired students-'t' test were used here as statistical tools. Statistical analysis was done by using SPSS version 16. When p value was < 0.05, it was considered as significance.

Results

This hospital based perspective follow-up study included 60 severely malnourished children. They were divided into 2 equal groups; Group I and Group II. Group I children got standard PEM treatment and Group II children received oral magnesium along with standard PEM treatment. After completion of data collection, all data were compiled tabulated and analyzed according to objective set for the study. The age and height distribution of studied children were comparable. Table-V showed the mean age of Group I children was 21.13±13.02 months and that of Group II was 22.52±12.13 months. Height of Group I children was 70.95±8.90 cm and that of Group II was 72.77±8.37 cm (Table-I).

Table I: distribution of the study population by age and height (N=60)

Parameters	Group-I (n=30)	Group-II (n=30)	P value
Age (months)			
Mean±SD Range	21.13±13.02 7-48	22.52±12.13 6-59	>0.50^{ns}
Height (cm)			
Mean±SD Range	70.95±8.90 58-88	72.77±8.37 61-96	>0.10^{ns}

P value reached from unpaired student's-'t' test, ns = not significant

Table II showed the sex distribution of malnourished children. In Group I, male & female are in equal number and in Group II the number of male are 18 (60%) and that of female are 12 (40%). Sex distribution was also comparable.

Table II: Distribution of the study population by sex (N=60)

Sex	Group-I (n=30) No. (%)	Group-II (n=30) No. (%)	P value
Male	15 (50.0)	18 (60.0)	>0.10^{ns}
Female	15 (50.0)	12 (40.0)	

P value reached from Chi square test, ns = not significant

Clinical profile of studied children was shown in Table III. Before treatment diarrhea was found in 17 (56.7%) children in Group I and 23 (76.7%) children in Group II. The difference was not significant. After giving treatment, diarrhea was improved in the children of both the groups but much improvement occurred in the children of Group II. Nausea/ vomiting was seen in 22

(73.3%) and 16 (53.3%) children respectively in Group I and Group II before treatment. After treatment, this was improved completely (100%) in Group II but only 76.7% was improved in Group I. This was statistically significant, P<0.01. Poor appetite was noted in 25 (83.3%) in Group I and 22 (73.3%) in Group II patients before treatment which is comparable. But after treatment, appetite was improved significantly in magnesium supplemented group (P <0.01).

Table III: Pre-treatment and post treatment clinical profile of study population (N=60)

Group-I Clinical profile	Group-II (n=30) No.	(%)	(n=30) No.	(%)	P value
Diarrhea					
Day 1					>0.05 ns
Present	17	(56.7)	23	(76.7)	
Absent	13	(43.3)	7	(23.3)	
Day 14					>0.50 ns
Present	1	(3.3)	1	(3.3)	
Absent	29	(96.7)	29	(96.7)	
Nausea/vomiting					
Day 1					>0.10 ns
Present	22	(73.3)	16	(53.3)	
Absent	8	(26.7)	14	(46.7)	
Day 14					<0.01 **
Present	7	(23.3)	0		
Absent	23	(76.7)	30	(100.0)	
Appetite					
Day 1					>0.10 ns
Hungry	3	(10.0)	6	(20.0)	
Normal	2	(6.7)	2	(6.7)	
Poor	25	(83.3)	22	(73.3)	
Day 14					<0.01 **
Hungry	9	(30.0)	21	(70.0)	
Normal	13	(43.3)	8	(26.70	
Poor	8	(26.7)	1	(3.3)	

Table III (contd....)

Clinical profile	Group-I (n=30) No.	(%)	Group-II (n=30) No.	(%)	P value
Appearance					
Day 1					>0.50 ns
Normal	1	(3.3)	0		
Apathetic	5	(16.7)	4	(13.3)	
Irritable	24	(80.0)	26	(86.7)	
Day 14					>0.05 ns
Normal	27	(90.0)	30	(100.0)	
Apathetic	0		0		
Irritable	3	(10.0)	0		
Generalized weakness					
Day 1					
Present	30	(100.0)	30	(100.0)	
Absent	0		0		
Day 14					<0.001 ***
Present	15	(50.0)	2	(6.7)	
Absent	15	(50.0)	28	(93.3)	
Tremor					
Day 1					>0.50 ns
Present	8	(26.7)	10	(33.3)	
Absent	22	(73.3)	20	(66.7)	
Day 14					
Present	0		0		
Absent	30	(100.0)	30	(100.0)	

Table III (contd....)

Clinical profile	Group-I (n=30) No.	(%)	Group-II (n=30) No.	(%)	P value
Symmetrical edema					
Day 1					>0.05 ns
Present	15	(50.0)	16	(53.3)	
Absent	15	(50.0)	14	(46.7)	
Day 14					>0.50 ns
Present	0		0		
Absent	30	(100.0)	30	(100.0)	
Skin changes					
Day 1					
Present	5	(16.7)	5	(16.7)	>0.50 ns
Absent	25	(83.3)	25	(83.3)	
Day 14					
Present	2	(6.7)	0		
Absent	28	(93.3)	30	(100.0)	>0.10 ns
Liver palpable					
Day 1					
Yes	10	(33.3)	5	(16.7)	>0.10 ns
No	20	(66.7)	25	(83.3)	
Day 14					
Yes	10	(33.3)	5	(16.7)	>0.10 ns
No	20	(66.7)	25	(83.3)	

P value reached from Chi square test; ns = not significant; */**/*** = significant

In both the groups, majority of the studied patients showed irritability which was improved after treatment and magnesium supplemented group showed better improvement. Generalized weakness was found in all the patients in both the groups before treatment. After magnesium supplementation, generalized weakness was improved in most of the cases 28 (93.3%) and only 15 (50%) occurred in non-supplemented group which was statistically significant, (P<0.001). Tremor was found in some children which was improved after treatment and magnesium supplementation did not show any significant difference in its improvement. Symmetrical edema was seen in about 50% patients of both the groups which disappeared completely after treatment and magnesium supplementation showed no change in subsiding edema. Skin changes were found in small number of studied children with malnutrition.

After treatment, it was improved in 100% cases in Group II and 93.3% cases in Group I but this difference was not significant. Liver was palpable in 10 (33.3%) children in Group I and 5 (16.7%) in Group II which was palpable after treatment but size of the liver was reduced after treatment. Magnesium supplementation did not affect in reducing the size of the liver. Pre and pos-treatment associated infections are shown in Table IV. Gastroenteritis, 10 (33.3%) in Group I and 14 (46.7%) in Group II, was most common and followed by tuberculosis, oral candidiasis and pneumonia. Infections were improved after symptomatic treatment of 14 days except tuberculosis. Tuberculosis patients were given anti TB drugs in adequate doses and duration.

Table IV: Pre and post treatment associated infections (N=60)

Parameters	Group-I (n=30) No.	(%)	Group-II (n=30) No.	(%)	P value
Day 1					>0.10 ns
Tuberculosis	3	(10.0)	6	(20.0)	
Pneumonia	2	(6.7)	1	(3.3)	
Gastroenteritis	10	(33.3)	14	(46.7)	
Oral candidiasis	5	(16.7)	2	(6.7)	
Dermatitis	0		1	(3.3)	
None	10	(33.3)	6	(20.0)	
Day 14					>0.10
Tuberculosis	3	(10.0)	6	(20.0)	
None	27	(90.0)	24	(80.0)	

P valu from Chi square test; ns = not significant

Table V showed the effect of treatment on weight of children. Weight was comparable in both the groups before treatment i.e. 6.21±1.97 kg Vs 6.23± 1.40 kg. After treatment weight was 6.60±1.90 kg Vs 6.91±1.67 kg in Group I and Group II respectively. The weight was significantly different after treatment in both the groups. The rate of weight gain (g/kg/day) was significantly different in Group I and Group II which were 9.27±3.15 and 13.16±6.78 respectively and 'P' value < 0.01.

Table V: Effect of treatment on weight of the children (N=60)

Weight (kg)	Group-I (n=30)	Group-II (n=30)	P value
Day 1			
Mean±SD	6.21±1.97	6.23±1.40	>0.50 ns
Range	3.5 -11.0	4.1-9.0	
Oedema subsidized[a]			
Mean±SD	6.08±1.86	6.08±1.31	>0.50 ns
Range	3.5 -10.2	4.1-9.0	
Day 14			
Mean±SD	6.60±1.90	6.91±1.67	>0.50 ns
Range	3.7 -10.7	4.5-11.7	
P value			
Day 1 vs day 14	<0.001 ***	<0.001 ***	
Oedema subsided vs day 14	<0.001 ***	<<0.001 ***	
Rate of weight gain (g/kg/day)[b]			
Mean±SD	9.27±3.15	13.16±6.78	<0.01 **
Range	3.0 -17.0	0.0-28.0	

a Symmetrical edema was present in 15 (50%) children of group I and 16 (53.3%) of group II, which completely subsidized on different days of treatment

b Rate of weight gain was calculated taking weight after edema completely subsidized and weight on day 14

Statistical comparison between groups: unpaired Student's-'t' test, and between days: paired Student's 't' test; ns = not significant; **/*** = significant

Table VI showed pre and post-treatment MUAC of the children. Both the groups are comparable before and after treatment. But significant different was seen between pre-treatment and post-treatment values in both the groups. Group I -101.00±9.77 mm Vs 107.00±10.32 mm , P<0.001, Group II - 101.67±9.94 Vs 108.00±9.43, P<0.001.

Table VI: Pre and post treatment MUAC of the children

Statistical comparison between groups: unpaired Student's 't' test, and between days: paired Student's 't' test; ns = not significant; *** = significant

Pre-treatment and post-treatment serum magnesium levels of the malnourished children were depicted in

Table VII. Pre-treatment magnesium levels were comparable in both the groups, 1.47±0.30 mg/dL Vs 1.37±0.30 mg/dL, P>0.10. Post-treatment magnesium values were significantly different in Group I and Group II i.e. 1.52±0.27 mg/dL Vs 2.03±0.31 mg/dL and P< 0.001 respectively. In group I, pre-treatment Vs post-treatment values were not significant, P>0.10 whereas in Group II, this value is highly significant, P<0.001.z

Serum magnesium (mg/dl)	Group-I (n=30)	Group-II (n=30)	P value
Day 0			
Mean±SD	1.47±0.30	1.37±0.30	>0.10 ns
Range	1.0-2.1	1.0-2.0	
Day 14			
Mean±SD	1.52±0.27	2.03±0.31	<0.001 ***
Range	0.9-2.1	1.5-2.6	
P value			
Day 0 vs day 14	>0.10 ns	<0.001 ***	

Discussion

Malnutrition continues to be a major public health problem throughout the developing world. Two-thirds of under-5 children are malnourished in Bangladesh.[3] Diets in population are frequently deficient in macronutrients, micronutrients or both. Out of important micronutrients, magnesium is gaining recognition as a clinically important electrolyte.[1]

In this study, children were 6-59 months of age and mean age was 21.13±13.02 months (Group-I) and 22.52±12.13 months (group-II). Other study showed similar age group.[14] Girls suffer more from malnutrition than boys.[4,14,15] In our series, male predominance were found with a male to female ratio of 1.2:1 which is consistent

with a study by Karla at el.[16] It might be that parents gave more importance to their male children and seek medical advice more frequently.

Diarrhea is a common accompaniment of the clinical picture of overt PEM.[14] In our series, we found it in 40 (60%) of children. This finding is consistent with the findings of other studies. Nausea/vomiting is associated with hypomagnesaemia.[5] In our study, it was improved in all cases in magnesium supplemented group but not so in magnesium un-supplemented group; 100% Vs 76.7% respectively which was statistically significant ($p < 0.01$). Similar finding was reported by Caddell JI from Nigeria.[17]

In general, magnesium supplemented children rapidly acquired appetite.[17] In this study, magnesium supplemented group showed significant improvement of appetite. Similar finding was found by the other authors.[17, 18] Hyperirritability was found in most of the children both the groups (80% in group I & 86.7% in group II). It was improved in all except 3 children in magnesium un-supplemented group and in all children in magnesium supplemented group. This was not statistically significant.

Generalized weakness was found in all cases of studied children. Significant improvement was found in magnesium supplemented group. This weakness may be due to hypomagnesaemia.[5, 11] Similar observation was noted by Caddell and Shills.[17, 18] Symmetrical edema was found in half of the children of both groups. Some of them had kwashiorkor and other had marasmic kwashiorkor. This edema had been subsided and none of them showed any edema on day [14] of treatment in both groups. Nichols at el[12] stated that low magnesium level did not appear to limit recovery from malnutrition.

Skin changes were found in a small number of children. It was improved in a all cases in group II and 93.3% in group I. But Caddell JI[17] showed early healing of skin lesions in magnesium supplemented group. This difference may be due to small number of children with skin changes were included into this study. Weight was comparable in both groups before treatment. After treatment, significant weight gain occurred in children of both groups. Rate of weight gain was accelerated after magnesium supplementation.[12] In our series, the rate of weight gain was 9.27±3.15 gm/kg/day in group I and 13.16±6.78 gm/kg/day in group II. This difference was statistically significant. Similar finding was noted by Montgomery.[19]

Mean serum magnesium level was 1.47 mg/dl in group I and 1.37 mg/dl in group II. These levels were below normal value of 1.57 mg/dl; Singla et al.[8] noted similar findings. Montgomery reported serum magnesium levels as low as 1.2 mg/dl which is comparable to our study.[19] On day-14 mean serum magnesium level was 1.52 mg/dl in group I and 2.03 mg/dl in group II. Karla et al (1975) found serum magnesium level 1.92 mg/dl before magnesium supplementation and 2.23 mg/dl after magnesium supplementation which is comparable to our study.

Conclusion

Irritability, nausea/vomiting, diarrhea, infections, loss of appetite, bipedal edema and skin changes were most frequent clinical features of malnutrition among studied children which were improved more significantly with magnesium supplementation in treatment.

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ORIGINAL ARTICLE

The Osmani Medical Teachers Association Journal Volume 17 Number 2

Treatment of complete rectal prolapse by Well's operation(Study of 20 cases).

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Abstract

Complete rectal prolapse consists of protrusion of all the layers of rectum. It is usually more than 4 cm and commonly as much as 10-15 cm in length. It is commonly disease of female & elderly person, but children may be affected. Weak pelvic floor, fecal incontinence, constipation, uterine prolapse may be associated with it. Common mode of presentation are something coming down through the rectum, bleeding, discharge & itching. Though the diagnosis is mainly clinical, but defecography or dynamic MRI, colonic transit studies and barium enema or colonoscopy are helpful for perfect evaluation. Main stay of treatment is surgical. Well's procedure has better outcome with low morbidity & recurrence. To show that this procedure can solve the problem with lower recurrence rates & accepted morbidity. This observational study was carried out on 20 patients who were selected from January 2011 to December 2017,a total 7 years period by the surgery department of Central medical college, Comilla,Bangladesh with complete rectal prolapse. Among the 20 patients female: male ratio was 2.3:1. Most of the patients were from poor socioeconomical status 9(45%) & selected recurrent cases were 3(15%). Presentation were something coming down per rectum 20(100%),discharge 5(20%),itching 4(20%),bleeding 2(10%). All patients were undergone Well's procedure & 16(80%) were under SAB & 4(20%) were G/A. Their hospital stay time were 7-10 days. Patients were followed up according to schedule .Compliations occured postoperative rectal pain during defecation1(5%), constipation 1(5%) , wound infection1(5%), peroperative rectal perforation 1(5%),multiple discharging sinuses 1(5%) & incisional hernia1(5%) .Which were managed according to their merits. In the treatment of rectal prolapse abdominal procedure has better outcome.Among a number of techniques selected procedure has low morbidity. Complete rectal prolapse, Well's procedure, recurrence,low morbidity.

[OMTAJ 2018; 17 (2)]

Introduction

Complete rectal prolapse or procedentia is defined as extrusion of the full thickness of the circular folds of the rectum through the anal muscles beyond the anal verge[1].The protrusion of the rectum through the anal canal may be classified as partial or incomplete when the prolapse only involves the mucosa of the lower rectum or complete when the entire thickness of the rectal wall is involved[2].The protrusion consists of all layers of rectal wall and is usually associated with a weak pelvic floor3.Complete prolapse is uncommon in children. In adults ,it can occur in any age, but it is common in elderly. Women are affected six times more often than men[3].

Symptoms may include bowel protrusion during lifting or coughing, need manual replacement, mucous discharge and rectal bleeding[4].Fecal incontinence, constipation and uterine prolapse are frequently associated with rectal prolapse[3,4].Examination most often reveals concentric rings of rectal tissue with a patulous anal canal, poor voluntary tone, and a very mobile rectum within the vault[5]. Patients with rectal prolapse may be evaluated with anorectal physiology testing, defecography or dynamic MRI, colonic transit studies and barium enema or colonoscopy[6].Ileocecal or rectosigmoid intussusception should be excluded as a differential diagnosis. The main complication is fecal incontinence & decubitus ulcer, but strangulation and gangrene may be occur.

Surgery is the only hope of cure and there is no alternative of choice for complete rectal prolapse .The number of operations designed to treat rectal prolapse is a reflection of the difficulties that surgeon experiences in securing good long term results[7].Both abdominal and perineal approaches to this condition have been extensively explored. Abdominal repairs usually involve mobilization of the rectum and its fixation to the sacrum with sutures or a prosthetic material or mesh4. Abdominal rectopexy is considered to be the the gold

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standard for the treatment of full thickness rectal prolapse[1,4]. Many centre performed the operation with the use of anterior or posterior mesh with a gap to prevent constipation. We were used anterior mesh with a gap and the procedure is termed as Well's procedure[1].The procedure can be performed by open, laparoscopic & robotic technique.

The aim of reconstruction is to prevent prolapse and improve bowel function with accepted morbidity and recurrence rates. We have completed the study with a small sample volume and have tried our best to minimize the morbidity by Well's procedure. Though there was some complications but the technique was end up with no recurrence in 7 years follow up.

Materials and Methods

In this observational type of prospective study 20 patients were included from January 2011 to December 2017,a total 7 years period who came to surgery department of Central medical college, Comilla with complete rectal prolapse. Detailed history, clinical examination & their investigations were assessed for their operability. Obese patients were selected for G/A & remaining were for SAB. All the patients were included according to the inclusion & exclusion criteria. Every patient with accompanying responsible person were given an explanation of the study and informed consents were obtained. The sample size was small due to unavailability of many cases & new institutional approach were the limitations of the study. Data collection sheet was maintained by microsoft excel programme.

Inclusion criteria

1. Patient with complete rectal prolapse.
2.Recurrence after previous perineal surgery.
3.Patients age < 70 years.
4.Patients in absence of straining factors (Constipation, BHP,Br.asthma).

Exclusion criteria

1.Old frail patient(age>70 years).
2.Patients with co-morbidity(DM,IHD,COPD).
3.History of previous transabdominl pelvic surgery.
4.Partial rectal prolapse or prolapsed hemorrhoids (4^{o}).

Surgical Technique

Patients were undergone Well's procedure in supine position under G/A or SAB according to their body habitus. Abdomen was opened by lower midline incision.Rectus muscles were retracted by self retaining abdominal retractor for better exposure of pelvis. Small guts were packed above the pelvis with using large mops. Prerectal peritoneum was dissected and rectum was mobilized posteriorly. Limiting dissection to the anterior rectum minimizes autonomic nerve damage associated with posterior dissection and division of lateral stalks. A polypropylene mesh was placed anteriorly & covered posteriorly with a gap to prevent stricture. Superiorly the mesh was fixed with sacral promontary & inferiorly to lower sacrum and around the rectal wall. Divided prerectal peritoneum was closed with interrupted suture to prevent hematoma. Abdominal wall was closed in layers with a drain was kept in situ.

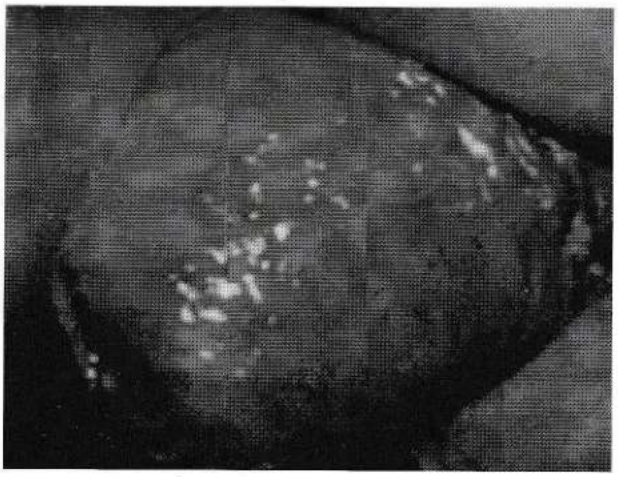


Figure I :Complete rectal prolapse

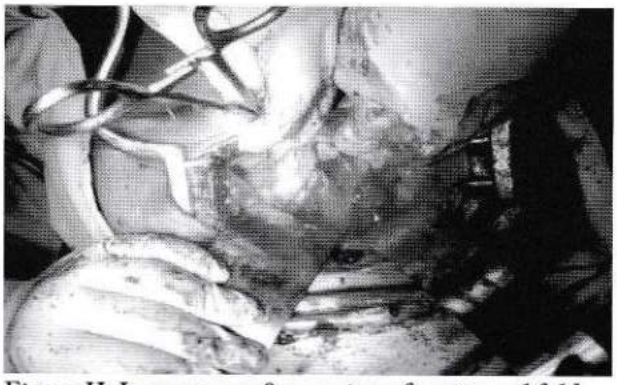


Figure II: Laparotomy & opening of peritoneal fold

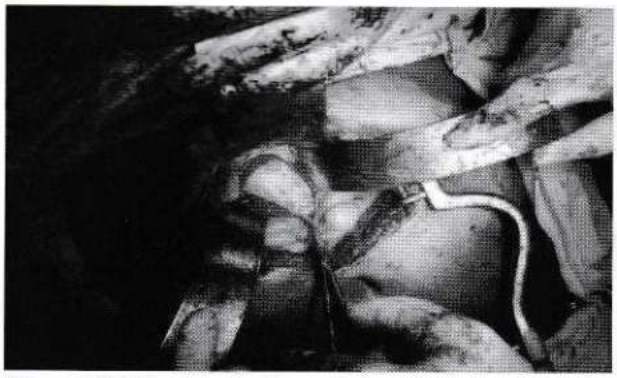


Figure III:Placement of anterior mesh

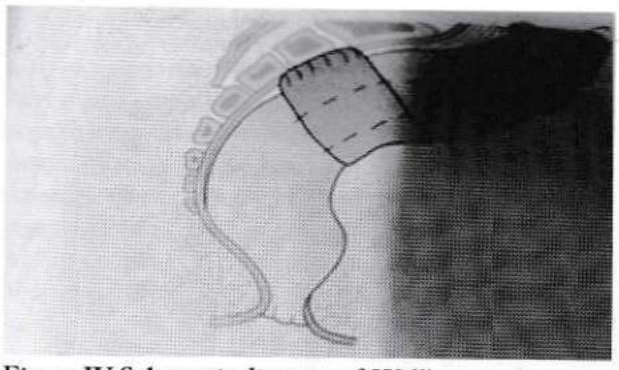


Figure IV:Schematic diagram of Well's procedure

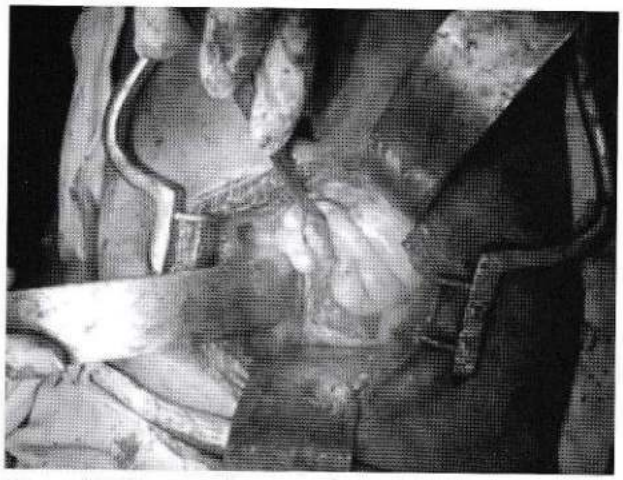


Figure V: Closure of prerectal peritoneum

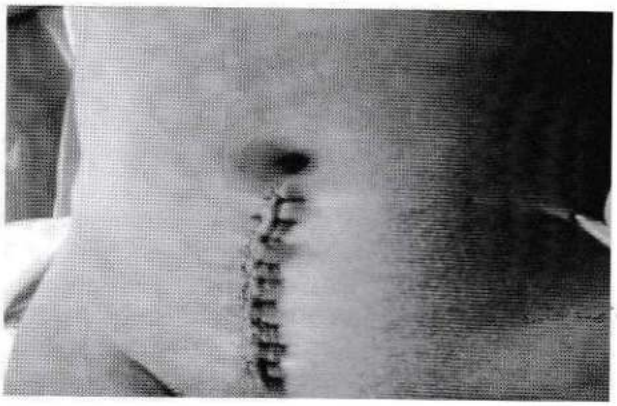


Figure VI: Closure of abdomen with a drain kept in situ

Results

In this study 20 patients were included. Among them 6(80%) were males and 14(20%) were females. Mean age was 52.9 years (range 30-70years). Of the 20 patients 4(20%) were Housewives,5(25%) worker,5(25%) service holders,1(5%) teacher,1(5%) advocate,1(5%) bussinessman,1(5%) farmer,1(5%) OT staff,1 (5%) retired person. Most of the patients were from poor socioeconomical status 9(45%),8(40%) average and 3(15%) were rich.

3(15%) patients came with history of previous surgery(recurrent cases).Patients with hypertension were treated with antihypertensive preoperatively. In our study most common mode of presentation were something coming down per rectum 20(100%), discharge 5(20%),itching 4(20%),bleeding 2(10%). All patient were undergone Well's operation. Patients were selected for anaesthesia according to their body habitus. 16(80%) patients were under subarachnoid block & 4(20%) patients were operated under general anaesthesia.

All patients came with complete rectal prolapse, from January 2011 to December 2017, were assessed for its operability and investigated, and then they underwent Well's procedure. Most patients admitted in hospital for 7-10 days. Skin stitches were removed during follow-up around 7th day. All patients were followed up initially in 1st month, then on 6 month, for next 1st year,3rd year ,5th year & 7th year. 1(5%) patient had postoperative rectal pain during defecation,1(5%) patient had constipation,1(5%) patient had wound infection, 1(5%) patient had peroperative rectal perforation,1(5%) patient developed multiple discharging sinuses,1(5%) patient had incisional hernia.The rectal pain and constipation were subsided after 6 months medication with laxative, occasional analgesic & dietary modification, wound infection was managed conservatively.

Preoprative rectal perforation was managed with primary repair and kept the patient NPO for 4 days. Multiple wound sinuses were treated by exploration of all sinus tract and histopathology revealed it as a non-caseating granulomatous infection which was subsided by 2 years duration. Incisinal hernia was managed by hernioplasty. In our study there was no recurrence. All patients were followed up by a standard protocol, but most of the patient were not follow the schedule. In our perspect those who did not follow the schedule we think they have no problem. Most patients returned to work within 1 month.

Table I: Graphical representation of the study (n=20)
Age distribution:

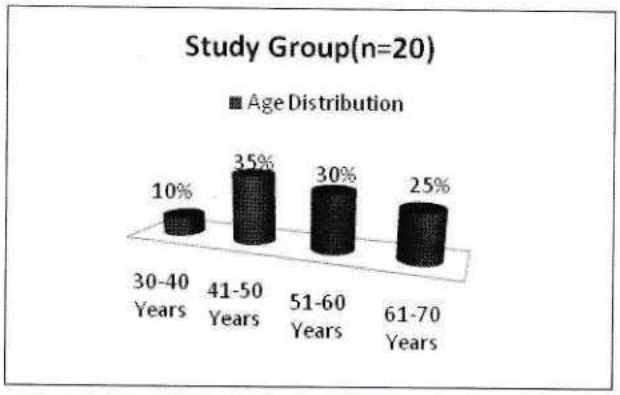


Table II: Sex variants

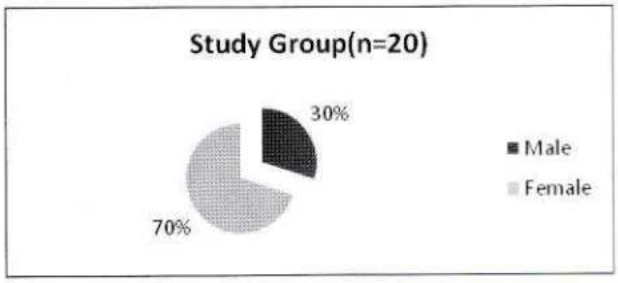


Table III: Presentation mode of the study group (n=20)

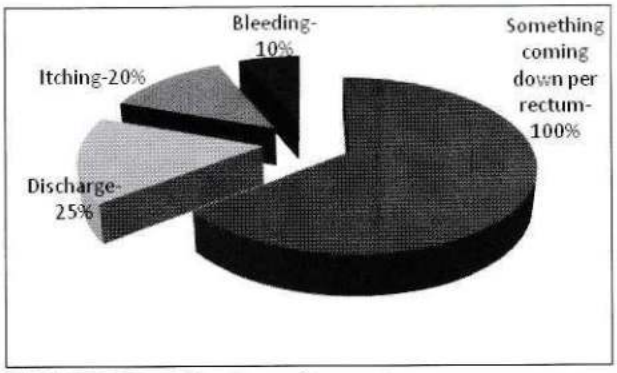
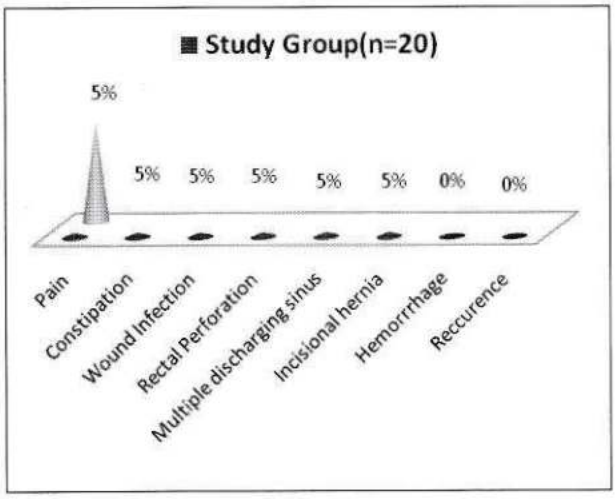


Table IV : Complications of operation



Discussion

In this observational series 20 patients with complete rectal prolapse were selected & undergone operative treatment by Well's procedure. The study was carried out by the department of surgery of Central medical college, Comilla with a total 7 years period(from January 2011 to December 2017).The clinical site of our hospital is running for 8 years. As a new institute we have collected only 20 cases in this series. Due to small sample size single unsatisfactory result showed a greater percentage. Frank J.et al, from section of proctology & surgery in Mayo clinic, Rochester, Minnesota collected 124 patients of rectal prolapse for different procedure from a period of more than 16 years[8].

In Our study out of 20 patients female: male ratio was 2.3:1. Brooke G & Massarat Z.wrote in a chapter of rectal prolapse of ASCRS text book of colon & rectal surgery, women are six times as likely as men to present with rectal prolapse[1]. Presentation at most common age group is 41-50 years (35%),next 51-60 years (30%) & 61-70 years 25%.Christian TH et al, showed the peak occurrence of the disease is in sixth decade of life[9].Our patients mean age was 52.9 years, where Frank J.et al showed it 45.3 years[8].We did not select any child in the study group, because pelvic surgery before adolescent has more chance of autonomic plexus injury due to inadequate space. A total 15% patients came with previous perineal surgery with recurrence which is similar to Linda Bohacek presented in his series recurrence rate by Thierch's operation(7-59%) & Delormes procedure (12-38%)[10]. In this study most common mode of presentation were something coming down per rectum 20(100%),discharge 5(20%),itching 4(20%),bleeding 2 (10%).It is also described by Y.Kariv in a chapter of surgery for rectal prolapse of a textbook of Anal and Rectal Diseases-A Conscise Manual-symptoms may include bowel protrusion, mucous discharge, rectal bleeding[3]. Brooke G & Massarat Z mentioned above symptoms with associated fecal incontinence(50-70%) & constipation(25-50%)[1].But we have not selected any patient with fecal incontinence.

There are numerous techniques for management of rectal prolapse; over 100 procedures have been described[5].The existance of so many surgical options is attestation to the lack of uniform success associated with any one single procedure[9].We have choosen Well's procedure for all selected patients to prevent recurrent prolapse, improve bowel function with accepted morbidity & recurrence rate.The goal of rectopexy is to anchor the rectum to the sacrum.This can be performed by open, laparoscopic & robotic technique[1]. The primary advantages of transabdominal procedures are the lower recurrence rates and the preservation of rectal reservior. Demerits are that they are more invasive procedure and associated with postoperative sexual dysfunction in males. Laparoscopic ventral rectopexy is the current gold standard for treatment of rectal prolapse in European countries[1].But it is technically demading as it requires pelvic dissection and suturing skills within a confined space. Robotic procedural advantages are three dimentional visualisation, tremor filtering, motion scaling, enhanced dexterity and superior precision[12]. Demerits include the loss tectile feedback and higher equipment costs.

In our all cases non absorbable mesh were used,but M. Arndt W.Pircher used absobable mesh for rectopexy with no pelvic infection and 6.4% recurrence[13].

All patients were followed up by a schedule as far as possible & following complications were noted which were managed according to their merits. The complications of our study were 1(5%) patient had postoperative rectal pain during defecation,1(5%) patient had constipation,1(5%) patient had wound infection, 1(5%) patient had peroperative rectal perforation,1(5%) patient developed multiple discharging sinuses,1(5%) patient had incisional hernia. In Anterior rectopexy some patient suffers from constipation, so some centre prffers posterior rectopexy with a gap[14].We were also maintain the gap anteriorly to avoid delayed stricture. Clarence EC et al, showed in their series of 816 patients with complete rectal prolapse & the complication rates were 2.22%,8.72%,12.31% for laparoscopic, perineal,open abdominal rectopexy[12].

Major complications included pelvic abscess (2.6-16%) & recurrence rate 3% by posterior rectopexy shown by Massarat Z. et al[8].Atkinson KG & Taylor DC published their recurrence rate 10% & 2.5% have obstruction following 40 patients by Well's procedure[11]. John Cullen et al, showed in their result rate of incisional hernia were 2.25% with laparoscopic rectoplasty[14].Weimann D et al, told laparoscopic ventral rectopexy offers benefits in terms of better rectal autonomic nerve preservation and reduced postoperative constipation[15]. So the choice of treatment for complete rectal prolapse for adult is accomplished by Well's procedure due the fact that the recurrence rates are lower with balancing morbidity & functional outcome.

Conclusion

Patients who have developed complete rectal prolapse, it may be associated with pelvic floor defect. Because during descend of the rectum it injured the anal canal by stretching internal sphincter or injury to the pudendal nerve during descent of the perineum. So before going to correction complete assessment of the condition of pelvic floor is essential. Otherwise operative success will be hampered with inevitable recurrence.

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ORIGINAL ARTICLE

The Osmani Medical Teachers Association Journal Volume 17 Number 2

Oral health status and behaviour among school going children in Sylhet city.

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Abstract

This cross sectional study on oral condition among school children in Sylhet city was conducted at The Sylhet Homes School and College, situated in Modina Market, Sylhet, Bangladesh. This study was carried out on 8th October, 2018 among 128 students mostly 12 years aged studying in Class VI. The main objective of the study was to assess the oral health condition of school going children through decayed, missing, and filled teeth (DMFT) status. Data was collected by personal interview and clinical examination of the respondents. Among 128 children, 54 (42.2%) were boys and 74 (57.8%) were girls. Among all, 28 (21.9%) respondents brush their teeth once daily while 93 (72.7%) respondents brush twice a day, and 7 (5.5%) of them brush their teeth more than twice daily. Fluoride containing toothpaste is used by 66 (51.6%) students, 54 (42.2%) students did not know whether their toothpaste contain fluoride or not, and 8 (6.3%) students do not use fluoride. Among all respondents, 57 (44.5%) did not have any decayed tooth, while 71 (55.5%) had tooth decay, and 6 (4.7%) had their teeth filled. Normal gingival condition was found in 108 (84.4%) subjects, but 20 (15.6%) of them had red or swollen gingiva. The mean DMFT of the study population was 1.70 which is considered as "low" according to "WHO quantification for the DMFT index".

[OMTAJ 2018; 17 (2)]

Introduction

Good oral health status is one of the essential components of general well being. Though in developed countries children's oral health status is improving over the last few decades, in developing countries caries incidence, , one of the important parameters of oral health status, is increasing markedly due to changing life-styles and dietary patterns.[1,2,3] According to World Health Organization (WHO), dental caries and periodontal disorders are the most common global health burden and most widespread chronic diseases of the modern era.[4, 5] The world oral health report 2003 revealed that in Asian countries 60-90% of school going children were dental caries affected. Poor oral health and untreated dental conditions increase the rate of school absenteeism significantly and decrease the rate of homework completion.[6,7,8] It also imposes negative impact on the quality of life of children and adults.[9] Proper oral health education including knowledge on maintaining oral hygiene, impact of sugar consumption and role of preventive and restorative dental health service etc. at school level plays an important role to improve the oral health status as well as quality of life of the future generation.[10]

The oral health status can be simply examined by "Decayed, Missing, Filled Teeth index (DMFT index)" and the state of gingiva (color and condition of gum tissue). The DMFT index, first developed by Klein, Palmer and Knutson in 1938 and modified by WHO, was created to express caries experience. The D component is for untreated caries, M for missing teeth due to caries, and F for filling (dental restorations for caries treatment). The T means index per tooth. The WHO recommended protocol for oral health surveys is based only on clinical examinations. [11]

Self care practice is considered as one of the major contributors to maintain good oral health. 12 This study focus on collecting data on the teeth cleaning pattern and the materials used for that purpose along with data on DMFT index and gingival condition to assess the oral health status of the participators. Since these data among school going children in Sylhet city are scarce and important for future dental public health planning, this study will provide important resource to the dental public health experts to make recommendations to the policy makers.

Materials and Methods

This descriptive type of cross-sectional study was carried out at Sylhet Homes School and College on 8th October, 2018 among 128 students aged average 12 years studying in Class VI. Sampling was done by convenient sampling technique. Data was collected by direct personal interview and clinical examination of the respondent students.

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Results

Total 128 students, comprising of 42.2% boys and 57.8% girls, of Sylhet Homes School and College participated in the study. The age of the respondents ranged from 12 to 18 years. Majority of the participants (87.5%) were students of class 6 and the rest were students of class 7 and class 10 (Table-1).

Table I: Socio-demographic and educational characteristics of respondents.

Characteristics	Frequency	Percentage
Age of the respondents (In years)		
12-15	117	91.4%
16-18	11	8.6%
Gender of the respondents		
Boy	54	42.2%
Girl	74	57.8%
Educational level of the respondents		
Class 6	112	87.5%
Class 7	8	6.25%
Class 10	8	6.25%

Table-2 shows, 97.7% of the respondents use tooth paste as their teeth cleaning material, but a large number of the students,42.2%, don't know whether their teeth cleaning material contain Fluoride or not. Majority of the student brush twice or more a day.

Table II: Pattern and materials used during teeth cleaning.

Characteristics	Frequency	Percentage
Tooth brushing frequency		
Once daily	28	21.9%
Twice daily	93	72.7%
More than twice	7	5.4%
Materials used for teeth cleaning		
Tooth paste	125	97.7%
Tooth powder	3	2.3%
Tooth paste/powdercontaining fluoride		
Yes	66	51.6%
No	8	6.3%
Don't know	54	42.2%

About 65.5% of the respondents had one or more teeth affected by dental caries. Only 6 of the participants lost one or more of their teeth due to caries and 10 of them having at least one of their teeth filled at the time of the survey. The overall gingival status of the participant were good, only 15.6% of them were found having red/swollen gum during the survey (Table-3).

Table III: Frequency distribution of oral examination of the respondents

Characteristics	Frequency	Percentage
Number of decayed teeth of the respondents		
0	57	44.5%
1	22	17.2%
2	17	13.3%
3	14	10.9%
4	6	4.7%
5	4	3.1%
6	4	3.1%
7	2	1.6%
8	2	1.6%
Number of Missing teeth of the respondents		
0	122	95.3%
1	3	2.3%
2	1	0.8%
3	1	0.8%
4	1	0.8%
Number of filled teeth of the respondents		
0	122	95.3%
1	2	1.6%
2	4	3.1%
Gingival condition of the respondents		
Normal/Healthy	108	84.4%
Red/Swollen	20	15.6%

Table 4 shows, the mean DMFT found in this study was 1.70, which is "LOW" according to the quantification of the severity of dental caries defined by WHO parameters, 1986. Mean number of missing and filled teeth were 0.0937 and 0.0781 respectively, whereas the mean number of decayed teeth was 1.531. The mean age of the respondents was 12.5 years and the mean number of teeth per participant was 24.

Table IV: Descriptive statistics

	Minimum	Maximum	Mean	Standard deviation
Age of the respondents	12	18	12.4609	1.27916
Number of teeth	20	28	24.0312	0.93857
Number of decayed teeth	0	8	1.5313	1.94789
Number of missing teeth	0	4	0.0937	0.49306
Number of filled teeth	0	2	0.0781	0.36821
DMFT index	0	8	1.7031	2.13098

Discussion

This study found more than 65% of the participant students were having either decayed or filled or missing teeth due to caries, which is within the range of 60-90% found in school going children in Asian countries documented in The world oral health report 2003.[7]

Almost all students (97.7%) use toothpaste as their teeth cleaning aid, which is similar, more than 90%, found among Malaysian adults aged 15 years.[13] Similar figures were found in most of the European countries and in Canada as well.[14] Though the percentage is very high, it is not surprising as emphasis to use toothpaste for brushing is provided in school education and also in all electronic media, and it is easily available and cheap in Sylhet city. Better socio-economic status compared to rural population also acts as a booster to maintain this practice.

More than 77% students brush twice or more times daily, which is in consistent with the children in Sweden, Denmark, Germany, Austria, and Norway.14 Formation of dental plaque can be prevented if tooth brushing is practiced thoroughly at regular intervals and brushing twice a day is recommended by most of the dental experts to control bacterial plaque .[15] The study reveals that brushing twice a day becomes the common pattern of teeth cleaning and a norm among students.

Though most of the students use toothpaste and brush twice daily, more than 42% of them don't know whether their toothpaste/toothpowder contains fluoride or not. Since the use of Fluoride is recognized as the most successful measures for caries prevention, improvement of knowledge on fluoridation can play a positive role.[16] In this study around 16% students have swollen or red gum which indicates moderate to severe gingivitis. In UAE and in rural India it was found 20% and 25% respectively. 17, 18 Proper scoring, however, could increase the rate of moderate to severe gingivitis among school going children in Sylhet city.

Mean DMFT found in this study was 1.70 which is considered as "Low" according to the quantification of the severity of dental caries defined by WHO parameters, 1986. In Asia, the prevalence of dental caries in children is reported to be low to moderate as well.[19] Decayed teeth contribute to the majority of the mean DMFT score (1.53 out of 1.70) which is in consistent with other studies.[10, 11] Large number of decayed teeth, that is, untreated caries among school going children indicates inadequate access to the oral health service and lack of awareness among the parents which can lead to teeth loss and other dental diseases in future.

Conclusion

Though the mean DMFT among school going children in Sylhet city is low and the overall gingival condition is good, the high rate of decayed or untreated caries indicates lack of awareness among the parents and also pointing towards the insufficiency of oral health service of that region. These issues need to be addressed as early possible to ensure general well being and improve the quality of life. The teeth cleaning pattern, brushing twice a day with toothpaste, of the study population is well accepted. But lack of knowledge on fluoride could end up increasing caries incidence in future. Adequate fluoridation of drinking water, availability of fluoride containing toothpaste etc. are needed to be ensured to decrease the incidence of dental caries. The findings of the study were discussed and interpreted considering several limitations including convenient sampling without randomization which in turn may not reflect the status of the target population leading to the chance of drawing biased information from the sample.

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ORIGINAL ARTICLE

The Osmani Medical Teachers Association Journal Volume 17 Number 2

Association of Central pulse pressure with the extent of angiographically detected coronary artery disease

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Abstract

This cross sectional study was carried out in patients with IHD undergoing Coronary Angiogram (CAG) in the Department of Cardiology, DMCH during Sept. 2009 to August, 2010. A total number of 125 consecutive patients having IHD were included in this study. Central pressure, brachial pressure was recorded during the procedure of CAG. Coronary Artery Disease (CAD) severity were assessed by Vessels score and Frisinger index .The mean age was 49.7 (±11.3) years and male female ratio 4.9:1. More than half (51.2%) of the study subjects had normal body weight. Nearly one fourth (23.0%) of the patients did not have any significant CAD, 27.2% had SVD, 22.4% had DVD and 27.2% had TVD. As a whole more than two third (67.2%) of the patients had extensive CAD according to Frisinger score (>5). Smoking, HTN, dyslipidaemia, Diabetes mellitus (DM) and family history of premature CAD were the most common risk factors among the study population. Central pulse pressure had strongest significant positive correlation (r=0.774; p<0.001) with CAD severity by Friesinger score, central systolic pressure had also significant positive correlation with CAD severity by Friesinger score (r=0.537; p<0.01), whereas central diastolic pressure had no positive correlation CAD severity (r=-0.148; p>0.05). Brachial pressure had significant positive correlation (systolic pressure r =0.390; p<0.001 and pulse pressure r=0.370; p<0.001) with CAD by Friesinger score but brachial diastolic pressure had no correlation with CAD severity by Friesinger score (r=-0.062; p>0.05). Moreover, Central pulse pressure had strongest significant positive correlation (r=0.791; p<0.001) with CAD by vessels score (SVD, DVD, 1. TVD). Whereas central diastolic pressure had no positive correlation with CAD by vessel score (r=-0.097; p>0.05). Brachial pressure had also significant positive correlation (brachial systolic pressure r=0.523; p<0.001 and brachial pulse pressure r=0.359; p<0.001) with CAD by vessel score but brachial diastolic pressure had no positive correlation with CAD number of diseased vessel (r=-0.033; p>0.05). Central pressure (systolic & pulse) were significantly associated with coronary artery disease severity (by vessels score and Friesinger index) than brachial pressure (systolic & pulse). Moreover, central pulse pressure had stronger association with coronary artery disease severity than central systolic pressure. But there was no association between diastolic pressures (Central & Brachial) with coronary artery disease severity.

[OMTAJ 2018; 17 (2)]

Introduction

Coronary heart disease (CHD) is a worldwide epidemic. In the united states for example, it is estimated that 13.7 million American have CHD, including more than 7.2 than million individuals who already have had myocardial infarction.[1] In group of persons older than 30 years of age 213 per 1,00,000 individual have CHD.[2] Although age specific events related to CHD have fallen dramatically in the last few decades, the overall prevalence has risen. Worldwide 30 percent of all deaths can be attributed to cardiovascular disease, of which more than half are caused by CHD as a consequence of life style changes in developing countries. Globally of those dying from cardiovascular disease 80 percent are in developing countries.[1]

Several major prospective epidemiologic studies have found that both systolic and diastolic hypertension have a strong positive, continuous, and graded relationship to CHD without evidence of a threshold risk level of blood pressure. Available evidence suggests a greater importance of lowering systolic than diastolic pressure.[3,4] In addition, pulse pressure predicts outcome and may be more strongly related to cardiovascular events than systolic

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pressure, depending on the age of the population studied.[5,6,7] Although antihypertensive agents differ in their ability to reduce pulse pressure, the efficacy of targeting pulse pressure as a treatment goal has not been proven.[8] Furthermore, pulse wave velocity, is a measure of vascular stiffness, has been related to cardiovascular risk in hypertensive patients, the elderly, patients with end-stage renal disease, and population-based samples potential evidence of greater prognostic importance of central aortic than brachial pressures has been obtained in treated hypertensive patients.[9,10,11] Central aortic pressure can now be easily measured during an invasive procedure like CAG. However it can also reliably determined by noninvasive techniques e.g. by sphygmocor from radial apianation tonometry.[12]

Although mean pressure is relatively similar in different large arteries, central aortic and brachial systolic and pulse pressures may differ considerably based on pulse wave velocity, a direct measure of arterial stiffness that influences timing of reflected waves returning from the periphery to the central aorta.[13,14] The resultant amplification of brachial compared with central pulse pressure is most pronounced in young and nonhypertensive individual. Central aortic pressures should more accurately reflect loading conditions of the left ventricular myocardium, coronary arteries, and cerebral vasculature and thereby, in theory, better relate to cardiovascular target organ damage and to cardiovascular events than brachial pressure and it is now possible to estimate the central aortic pressure indirectly from measurements made non-invasively from peripheral sites such the radial artery. In older patients with stiff arteries the central aortic systolic pressure is similar to the brachial pressure, whereas in younger subjects with compliant arteries, it is substantially lower.[15]

Different drugs have different effects on pulse pressure, and recent studies show that similar differences occur in their effects on central pressure.[16] There are, however, many different methods for measuring arterial stiffness, and there is disagreement as to which is the most reliable. Some have been shown to predict cardiovascular events, and it is likely that such measurement will become part of routine clinical practice in near future.[17,18] In Bangladesh no one has studied the association between central pulse pressure & the CAD. This study is therefore intended to find out whether central pulse pressure predicts severity of coronary artery disease, detected by coronary angiogram (CAG).

materials and methods

This cross sectional study were conducted in department of Cardiology, Dhaka Medical College Hospital (DMCH) from Sept. 2009 to August 2010. 125 patients with IHD who fulfil the criteria of CAG were included. Central aortic pressure (systolic, diastolic, and pulse pressure) was measured during CAG Interpretations of coronary angiogram were reviewed by at least two cardiologists. Angiographic severity of coronary artery disease were assessed by 2 indices - 'Number of vessels diseased' and 'Friesinger index'. Patients were studied by comparing central and brachial pressure with angiographic severity index. Data are presented as percents or mean, standard deviation (±SD). Means of continuous variables were compared using ANOVA in the setting of distribution. Relations of central and brachial blood pressures, number of disease vessels and Friesinger score were determined using Pearson's correlation coefficient. p value <0.05 was considered as significant. Statistical analyses were performed with SPSS, version 16.0.

Results

The mean age was 49.7 (±11.3) years with range from 23 to 71 years and the most (34.4%) of the patients found between 46-55 years age group. Rahman (1997) in a Bangladeshi study found that the mean age was 50.21 years and most of patients were found in the age range of 45 to 59 years, which closely resembles to present study.19 Moreover Enas (2005) showed that people of South Asia developed coronary events at an earlier age, which explain the lower mean age in the in the current study.[20] Male was predominant (83.2%) in the present study and 16.8% was female. Male female ratio was almost 5:1. Mean BMI was 24.1±4.1 kg/m2 with range from 16.0 to 46 kg/m2 and more than one third (37.6%) of the patients were overweight.

In this current study, coronary angiographic severity was assessed by number of diseased vessel and Frisinger score. It was observed that nearly one fourth (23.0%) patients did not had any significant CAD and rest 72.0% had significant CAD, out of which 27.2% had SVD, 22.4% had DVD and 27.2% had TVD. Almost similar findings were obtained by Rahman (1996). Regarding the Friesinger score majority (41.6%) of the patients had Friesinger score (5 - 10), followed by 25.6% had Friesinger score (11 - 15), 20.8% patients had Friesinger score (1 - 4) and 12.0% patients Friesinger score zero (0). As a whole more than two third (67.2%) of the patients had extensive CAD (Friesinger score >5). The findings were comparable with the present study Da Luz et al. (2008) and Bampi et al. (2009).[21,22]

The most common risk factors were smoking (60.8%), HTN (53.0%), dyslipidaemia (48.0%), Diabetes mellitus (DM) (31.2%) and Family history of premature CAD (13.6%). The findings regarding the traditional risk

factors were equivalent with Weber et al, (2003).23 In this study the mean central systolic blood pressure (SBP) was found 128.6±16.9 mmHg with range from 100 - 165 mmHg in patients having no CAD, 135.7±17.5 mmHg with range from 100-170 mmHg, in patients with single vessel disease, 146.6±18.4 mmHg with range from 106-180 mmHg in patients with double vessel disease and 162.4±22.7 mmHg with range from 110-200 mmHg in patients with triple vessel disease ($p<0.05$). However, the mean central DBP was found 75.0±12.0 mmHg with range from 60-100 mmHg in patients having no CAD, 80.2±12.8 mmHg with range from 60-100 mmHg in patients with single vessel disease, 80.2±14.3 mmHg with range from 59-110mmHg in patients with double vessel disease and 82.8±13.9 mmHg range from 60-110 mmHg in patients with triple vessel disease, which are not significantly increased in patients with different number of disease vessels.

The mean central pulse pressure was found 39.7±9.3 mmHg with range from 25-60 mmHg in patients having no CAD, 53.8±12.3 mmHg with range from 30-70 mmHg in patients with single vessel disease, 66.4±9.6 mmHg with range from 30-80 mmHg in patients with double vessel disease and 79.6±14.3 mmHg with range from 40-100 mmHg in patients with triple vessel disease ($p<0.05$). On the other hand it was observed that the mean brachial systolic blood pressure was found 138.3±20.9 mmHg with range from 100-170 mmHg in patients having no CAD, 126.3±16.4 mmHg with range from 100-160 mmHg in patients with single vessel disease, 129.5±16.6 mmHg with range from 100-160 mmHg in patients with double vessel disease and 140±19.7 mmHg with range from 100-170 mmHg in patients with triple vessel disease, which increase with number of disease vessels significantly ($p<0.05$). Similarly, the mean brachial diastolic blood pressure was found 80.5±20.4 mmHg with range from 60-110 mmHg in patients having no CAD, 80±12.1mmHg with range from 60-110 mmHg in patients with single vessel disease, 75.4±13.2 mmHg with range from 55-100 mmHg in patients with double vessel disease and 80.3±13.4 mmHg with range from 60-120 mmHg in patients with triple vessel disease, which are almost similar in patients with different number of disease vessels.

The mean brachial pulse pressure was found 46.2±17.3 mmHg with range from 20-60 mmHg in patients having no CAD, 46±10 mmHg with range from 20-60 mmHg in patients with single vessel disease, 54.6±10.7 mmHg with range from 30-70 mmHg in patients with double vessel disease and 58.7±15.8 mmHg with range from 60-80 mmHg in patients with triple vessel disease, which increase with number of disease vessels significantly ($p<0.05$). Similar findings obtained by Weber et al, (2003).[23]

Fig.: The scatter diagram shows significant positive correlation (r= 0.539) between number of diseased vessel with brachial pulse pressure (mmHg) of the study patients. (n=125) The mean central systolic blood pressure was found 129.0±16.6 mmHg with range from 100-170 mmHg in patients having Friesinger score 0-4, 148.2±17.7 mmHg with range from 106-180 mmHg in patients having Friesinger score 5-10 and 161.6±23.1 mmHg with range from 110-200 mmHg in patients having Friesinger score 11-15, which increase with Friesinger score significantly ($p<0.05$). The mean central diastolic blood pressure was found 84.6±13.3 mmHg with range from 60-125 mmHg in patients having Friesinger score 0-4, 82.3±15 mmHg with range from 59-110 mmHg in patients having Friesinger score 5-10 and 81.4±13.5 mmHg with range from 60-110 mmHg in patients having Friesinger score 11-15, which follow no significant pattern with Friesinger score.

The mean central pulse pressure was found 43.8±11.1 mmHg with range from 25-63mmHg in patients having Friesinger score 0-4, 65.8±9.2 mmHg with range from 30-80mmHg in patients having Friesinger score 5-10 and 80.2±14.3mmHg with range from 40-100mm Hg in patients having Friesinger score 11-15, which increase with Friesinger score significantly ($p<0.05$).

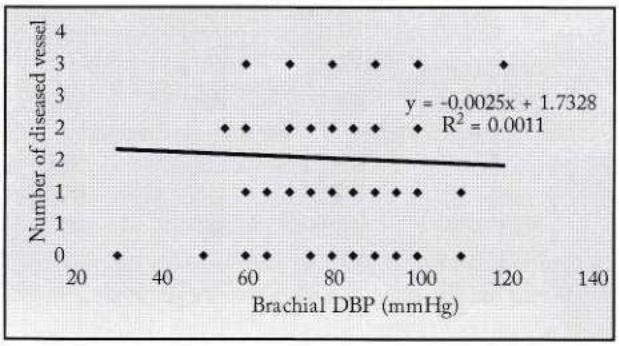

Fig. : The scatter diagram shows no significant correlation (r= -0.033) between number of diseased vessel with brachial DBP (mmHg) of the study patients. (n=125)

Similarly, the mean brachial systolic blood pressure was found 130.8±21.1 mmHg with range from 100-170 mmHg in patients having Friesinger score 0-4, 136.1±16.3 mmHg with range from 100-160 mmHg in patients having Friesinger score 5-10 and 144.4±20.2 mmHg with range from 100-170 mmHg in patients having Friesinger score 11-15, which increase with Friesinger score significantly ($p<0.05$). The mean brachial diastolic blood pressure was observed 80.5±17 mmHg with range from 60-130 mmHg in patients

having Friesinger score 0-4, 77.7±13.9 mmHg with range from 55-100 mmHg in patients having Friesinger score 5-10 and 78.1±12.6 mmHg with range from 60-100 mmHg in patients having Friesinger score 11-15, which follow a bit decreasing trend with Friesinger score. The mean brachial pulse pressure was observed 44.2±14.4 mmHg with range from 20-60 mmHg in patients having Friesinger score 0-4, 54.4±9.4 mmHg with range from 30-70 mmHg in patients having Friesinger score 5-10 and 59.3±16.1 mmHg with range from 60-80 mmHg in patients having Friesinger score 11-15, which increase with Friesinger score significantly ($p<0.05$).

In this current series it was observed in central pressure strongest significant positive correlation ($r = 0.774$; $p<0.001$) was found between pulse pressure with Friesinger score, significant positive correlation between systolic pressure with Friesinger score ($r=0.537$; $p<0.01$) and no correlation between diastolic pressure with Friesinger score ($r=-0.148$; $p>0.05$). Similarly, in brachial pressure significant positive correlation ($r=0.450$; $p<0.001$) was found between pulse pressure with Friesinger score, significant positive correlation between systolic blood pressure with Friesinger score ($r=0.390$; $p<0.01$) and no correlation between diastolic pressure with Friesinger score ($r=-0.062$; $p>0.05$). On the other hand in central pressure strongest significant positive correlation ($r=0.791$; $p<0.001$) was found between central pulse pressure with number of diseased vessel, significant positive correlation between systolic pressure with number of diseased vessel ($r=0.558$; $p<0.001$) and no correlation between diastolic pressure with number of diseased vessel ($r=0.097$; $p>0.05$). Similarly, in brachial pressure significant positive correlation ($r=0.539$; $p<0.001$) was found between brachial pulse pressure with number of diseased vessel, significant correlation between brachial systolic pressure with number of diseased vessel($r= 0.523$; $p<0.05$), no correlation between brachial diastolic pressure with number of diseased vessel.

Table: Correlation between number of diseased vessel with blood pressure of the study patients (n=125)

Blood pressure (mmHg)	Pearson Correlation	p value
Central		
Systolic	0.558	0.001^{S}
Diastolic	0.097	0.283^{ns}
Pulse pressure	0.791	0.001^{S}
Brachial		
Systolic	0.523	$0.030s^{*}$
Diastolic	-0.033	0.715^{ns}
Pulse pressure	0.539	0.001^{S}

($r=-0.033$; $p>0.05$).

conclusion

Central pulse pressure, systolic pressure are increased (more than the brachial pressure) significantly with Friesinger score and the number of diseased vessel but no association found between central diastolic pressure with Friesinger score and the number of diseased vessel. But brachial pulse pressure, systolic pressure are also increased (less than the central pressure) significantly with Friesinger score and the number of diseased vessel but no association found between brachial diastolic pressure with Friesinger score and the number of diseased vessel.

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ORIGINAL ARTICLE

The Osmani Medical Teachers Association Journal Volume 17 Number 2

Study on the effect of Bisphosphonates on Bone Mineral Density in the Management of Postmenopausal Osteoporosis

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Abstract

Osteoporosis is caused by the cumulative effect of bone resorption in excess of bone formation. Bisphosphonates inhibit bone resorption with relatively few side effects. To assess the efficacy and safety of Bisphosphonates in Postmenopausal osteoporosis. Seventy patients with postmenopausal osteoporosis taking Bisphosphonates for their management were enrolled as study population. This prospective interventional study was conducted in the Department of Pharmacology & Therapeutics, Sher-E-Bangla Medical College, Barisal over a period of one year from Jan 2015 to Dec 2015. The follow up was taken after 3 months. Bone mineral density (BMD) of femoral neck was observed. Bone mineral density was measured by dual-energy x-ray absorptiometry. The mean of baseline bone marrow density (BMD) T score of seventy post-menopausal osteoporosis women was found -2.90±0.28 with the range of -2.55 to - 3.97. On the other hand the mean bone marrow density (BMD) T score was found -2.45±0.21 with the range of -2.01 to -2.90 after 3 months of intervention. There was statistically highly significant difference between baseline and follow up BMD level of hip ($p < 0.0001$). After three months, BMD was increased 14.93%. Drug related complication was found only in 4.3% patients. Hence, no serious adverse events were observed. Patient's satisfaction was recorded 95.7%. Daily treatment with bisphosphonates progressively increases the bone mass which is measured by bone mineral density in postmenopausal women with osteoporosis with a few but non-serious adverse effects. Therefore, it should recommend to prescribe in postmenopausal osteoporosis women which ultimately reduce the incidence of fracture and raised the patient's compliance.

[OMTAJ 2018; 17 (2)]

Introduction

Osteoporosis is a significant clinical problem related to the state of a decreased mass per unit volume of normally mineralized bone. It is well established that low bone mass is one of the main predictor of fracturerisk, as bone mineral density declines.[1] mineral content Osteoporotic bone is characterized by excessive loss of with a reduction in the density per unit volume of bone. The major consequence of osteoporosis is fracture as osteoporotic bone is easily broken. The primary fracture sites are the long bones and vertebrae.[2] Fracture of the vertebrae are painful and causes spinal deformity; but fracture of the long bone especially the neck of the femur causes greatest morbidity and mortality.[3] Aging of populations worldwide will also contribute to a major increase of the incidence of osteoporosis in postmenopausal women.[4] About 40%-50% of women and 13%-30% of men will sustain one or more fragility fractures in their remaining lifetime.[5]

Osteoporosis may result in acute and chronic pain, disabilities, restricted movement until immobilization, impaired quality of life as well as social isolation. It is far more common than other diseases. In women over 45 years of age, osteoporosis accounts for more days in hospital than may other diseases, including diabetes, myocardial infarction, and breast cancer.[6] Osteoporotic fractures accounted for 0.83% of the global burden of non-communicable disease worldwide. Many studies have shown increase in mortality in connection with osteoporotic fractures.[5,7] This has been best characterized following hip fracture, but several recent studies of vertebral fracture, eg, Study of Osteoporotic Fractures (SOF) and European Prospective Osteoporosis Study (EPOS), have also indicated higher mortality in affected patients as opposed to the general population.[5,8] The objective of treatment of patients with postmenopausal osteoporosis is to reduce the risk of fractures and to prevent the impairment of quality of life as well as to reduce osteoporosis-related mortality. The clinical efficacy of new drugs to treat osteoporosis must be judged in clinical trials that use the reduction of fracture risk as the main end point.[9]

Material and Methods

This prospective interventional study was carried out in the Department of Pharmacology & Therapeutics, Sher-E Bangla Medical College, Barisal and Department of Orthopaedic Surgery, Bangabandhu Sheikh Mujib Medical University (BSMMU), Shahbag, Dhaka over a period of one year from January 2015 to December 2015. Seventy cases of postmenopausal osteoporosis taking only Bisphosphonates were enrolled

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as a study sample. For all analyses level of significance was set at 0.05.

Results

Table I: Age distribution of the patients

	Age (years)
Mean±SD	53.44±8.71
Range (min- max)	40–80 years

The mean age of post-menopausal women was found 53.44 ±8.71 years with the range of 40 to 80 years (Table I).

Table II: Distribution of patients according to age at menopause.

Age at Menopause	Frequency (n)	Percentage (%)
At 40 years	2	2.9
41 – 45 years	58	82.9
46 50 years	10	14.3
Total	70	100

A vast majority of the patients were being menopause during their 41 to 45 years of life which accounted 82.9% that followed by 46 to 50 years age group (14.3%) and at 40 years (2.9%).

Table III: Distribution of patients on the basis of BMI Group

BMI Group	Frequency (n)	Percentage (%)
Normal (18.5 – 24.9 kg/m^2)	51	72.9
Overweight (25.0 kg/m^2)	19	27.1
Mean±SD	23.30 ±3.24	
Min-max	19.80 – 40.0	

In this study, normal BMI was found in 72.9% patients whether 27.1% patients were reported as overweight. Mean BMI was 23.30±3.24 kg/m2 with the range of 19.80 to 40.0 (Table III).

Table IV: History of hysterectomy and oophorectomy of the study population

History	Frequency (n)	Percentage (%)
Yes	3	4.3
No	67	95.7

In this study population only 4.3% patients had history of hysterectomy and oophorectomy (Table IV).

Table V: Bone Mineral Density (BMD) at baseline and after 3 months of treatment.

Bone Mineral Density (BMD)	Mean (SD)	Min-max	p-value*
Baseline BMD at Hip	-2.90±0.28	-2.55 to - 3.97	<0.0001
Follow up BMD at hip	-2.45±0.21	-2.01 to -2.90	

* p-value derived from Independent sample t-test

Mean bone mineral density (BMD) at baseline was found -2.90±0.28 with the range of -2.55 to - 3.97. On the other hand the mean BMD after 3 months of treatment was found -2.45±0.21 with the range of -2.01 to -2.90. There was statistically highly significant difference between baseline and follow up BMD level of hip ($p < 0.0001$) (Table V).

Table VI: Distribution of patients according to percentage improvement of BMD during follow up of Bisphosphonate intake

Percentage Improvement	BMD
Mean±SD	14.93±7.02
Min-max	4.49- 37.69

In this study, the mean value of percentage improvement was 14.93±7.02%. However, the minimum improvement was recorded 4.49% and the maximum improvement 37.69 % (Table VI).

Table VII: Drug related complication of the study subjects

Drug related Complication	Frequency (n)	Percentage (%)
Present	3	4.3
Absent	67	95.7
Patient's satisfaction	67	95.7

Drug related complication was found only in 4.3% patients. Patient's satisfaction was recorded 95.7% (Table VII).

Discussion

In terms of age distribution of patients, the mean age of post-menopausal women was found 53.44±8.71 years with the range of 40 to 80 years. The mean age of forty-seven postmenopausal women with osteoporosis at baseline was 65.7 years with the age range of 52 to 83 years were analyzed by Iwamoto et al.[10]. A higher age was seen in developed countries. A study of clinical trial on postmenopausal women by Sachmechi et al.[11] in USA, measured the mean age 71.6 years. A vast majority of patients were being menopause during their 41 to 45 years of life which accounted 82.9% that followed by 46 to 50 years age group (14.3%). Only 2.9% patients went to menopause at 40 years. In case of BMI estimation, the mean BMI of the study population was found 23.30±3.24 kg/m2. Consequently according to WHO grouping of BMI, normal BMI was found in 72.9% patients and overweight was found in 27.1% patients. Sachmechi et al. [11] also measured the mean BMI in their study as 27.5 kg/m2. Iwamoto et al.[10] measured the mean BMI as 20.5 ± 1.1 kg/m2 with the range of 15.6-25.9.Mean bone mineral density (BMD) at baseline was

found -2.90±0.28 with the range of -2.55 to - 3.97. On the other hand the mean BMD after 3 months of treatment was found -2.45±0.21 with the range of -2.01 to -2.90. There was statistically significant difference between baseline and after 3 months BMD level of hip ($p < 0.0001$). A study in USA by Sachmechi et al. [11] calculated mean BMD at hip (T score) -1.44. According to percentage improvement of BMD during follow up of Bisphosphonate intake, the mean value of percentage improvement was 14.93±7.02%. However, the minimum improvement was recorded 4.49% and the maximum improvement 37.69%. In a study in USA, Sachmechi et al. [11] demonstrated a significant BMD gains in the spine and hip in alendronate-treated late postmenopausal osteoporotic women. In that study, they found a non-statistically significant BMD increase at the hip of 2.6% in the study group. A retrospective study by Iwamoto et al.[10] was performed to evaluate the outcome of alendronate (ALN) treatment, one of the bisphosphonates, for seven years in postmenopausal Japanese women with osteoporosis. They encountered lumbar spine BMD as the efficacy measurement and found +12.8% increased level at seven years compared with baseline values. Though they measure lumbar spine BMD not the femoral neck but the efficacy is in accordance with our findings.

Black et al.[12] also measured the efficacy of alendronate on BMD evaluation. They found increased of femoral neck BMD by 4.6%. Liberman et al.[13] also mentioned the same results in their study work. They reported that the women receiving alendronate had significant, progressive increases in bone mineral density at all skeletal sites including femoral neck which measured as mean 5.9±0.5 percent. Tucci et al.[14] in The U.S. Alendronate Phase III Osteoporosis Treatment Study Group also found that after 3 years, alendronate 10 mg induced marked increases in BMD of the lumbar spine (9.6 ± 0.4%), femoral neck (4.7 ± 0.7%) and trochanter (7.4 ± 0.6%) (mean ± SE; each p ? 0.001). A study on Risedronate, another bisphosphonate, by Reginster et al.[4] found that it significantly increased BMD at the lumbar spine, femoral neck and femoral trochanter within 6 months, showing that it promotes rapid increases in BMD at sites of cortical and trabecular bone. Here, drug related complication was found only in 4.3% patients. Patient's satisfaction was recorded 95.7%. No serious adverse events were observed, including osteonecrosis of jaw, atypical femoral diaphysis fractures, or atrial fibrillation. A recent study in Japanese women by Iwamoto et al.[10] also supported our study findings. Liberman et al.[13]
is also in accordance with our findings. They found that Alendronate was generally well tolerated, with no greater clinical or laboratory evidence of adverse effects. Our study results have to be viewed in light of certain limitations. This study is a retrospective analysis, and it is not large enough and the duration of follow up is not long enough to adequately assess fracture risk with a great degree of statistical power. Also, markers of bone formation and resorption were not available.

Conclusion

BMD was increased 14.93%. Drug related complication was found only in 4.3% patients. Hence, no serious adverse events were observed. Yet, patient's satisfaction was recorded in 95.7%.

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ORIGINAL ARTICLE

The Osmani Medical Teachers Association Journal Volume 17 Number 2

Is DES inferior to BMS in elderly ACS patients including Primary or Rescue Angioplasty on short duration of DAPT ? A randomized single blind study.

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Abstract

Elderly patients largely receive BMS than DES .The aim of this study was to compare the outcome between this two group of patients and the efficacy of DES in ACS including primary PCI and rescue angioplasty on short DAPT regimens (6 months).The primary outcome was the cumulative incidence of major adverse cardiac events at 30 days, 180 days and 365 days. MACE defined as a composite of all cause mortality, myocardial infarction , ischemia-driven target lesion revascularization (IDTLR), or stroke.Between January 2017 to February 2018, we randomly allocated 30 patients [50%] to DES and 30 [50%] to BMS whom we had performed PCI and were followed up until death or their 1 year visit (365 days ±2 weeks). Patients were eligible if they were above 65 years with no sex preference, All presented with either UA or MI and had subsequent PCI including primary and rescue angioplasty. Patients with previous PCI were also included. DAPT 300 mg loading dose was given pre procedurally and continued for target period. Follow up at regular interval at 30 days, 90 days, 180 days and at 365 days for any evidence of MACES . Patients were on average 78.4 years (SD 4.3) old and predominantly male (64%) in DES group; versus (81.3%) on average age in the BMS group with male preponderance 63%. The two groups were well balanced except for an excess of previous myocardial infarction in the DES group and more patients with hypertension and peripheral vascular disease is noted in the BMS group than in those receiving a DES. Left main stem PCI was uncommon but more frequent in the DES group (2/30 6.6% than in the BMS group. About (36%) patients in DES group and 29% in BMS group had multivessel disease and 7% had a staged procedure. Over 365 days follow up we noted Asymptomatic were 27/30 (90% in DES group and 20/30(66.6%) in BMS. Elderly patients in ACS who had PCI and received DES , showed favorable outcome in context to MACE. Our study shows that DES could be a good option in case of elderly patients undergoing a PCI with short at least 3 months DAPT regimens even patients who had undergone Primary PCI or Rescue Angioplasty. ACS, Elderly, PCI, DAPT

[OMTAJ 2018; 17 (2)]

Introduction

Management of elderly patients having percutaneous coronary interventions (PCI) is often challenging because of the facts that many a times elderly patients tends to have complex lesion characteristics with calcification, tortuosity , CTO and Bifurcation lesion .It is further compounded in ACS because of thrombus burden .[1,2,3]

Although society guidelines recommend at least 6 months of DAPT in stable DES-treated patients and 12 months in unstable DES-treated patients, shorter durations of DAPT in patients with high bleeding risk can be considered, but no age-specific recommendations are provided.[6] DES followed by a short DAPT regimen appeared to be safe and efficacious in patients at a high bleeding risk in the LEADERS-FREE trial,[7,8] including in the elderly subpopulation, and in those deemed to be uncertain candidates for a DES in the ZEUS trial.[10] Combination of a DES to reduce the risk of subsequent repeat revascularizations with a short BMS- like DAPT regimen to reduce the risk of bleeding events represents a potentially attractive option for elderly patients who have PCI [6,9]. To this end, we sought to compare the composite primary endpoint of all-cause mortality, myocardial infarction, stroke, or ischemia- driven target lesion revascularization at 1 year and secondary endpoints, including the rate of bleeding and stent thrombosis, between the DES and BMS in PCI patients aged 65 years or older receiving a similar short duration of DAPT in the SENIOR trial.

Optimal treatment strategy in PCI in ACS regarding type of the stent and duration of the anti platelets agents is still ill defined and mostly rest to the operators because no unanimous guidelines exist in this subset of patient group. Furthermore they have been largely excluded from randomized clinical trials assessing new drug-eluting stents (DES) or evaluating the optimal duration of dual anti platelet therapy (DAPT) after PCI[11,12]. Many elderly patients regularly receive BMS during PCI to minimize the risk of bleeding

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complications associated with long-term dual anti platelet therapy which are often given after DES implantation [6,15].The aim of our study was to look for the efficacy of DES in ACS including primary PCI and rescue angioplasty.

materials and methods

The study was randomized single blind sudy done at North east medical college Hospital from January 2017 to February 2018 . Total 60 patients were taken for the study. 30 patients were included in BMS and another 30 patients in DES group and followed at least 1 year for MACE (Death, TLR, Stent thrombosis, ISR etc).Patients were randomly assigned to PCI with a DES or BMS .DAPT duration was calculated from the day of PCI until the day of DAPT discontinuation. staged procedure was allowed but required them to be done within 2 weeks. DAPT 300 mg was loaded pre procedurally along with loading Ticagrel or Prasugrel and continued for 3 months at least with single Antiplatelet(SAPT) Aspirin 150 mg and then randomized SAPT 75 mg with either Ticagrel or Prasugrel or DAPT 150 mg only without Ticagrel or Prasugrel and continued for 6 months. Follow up at regular interval at 30 days, 90 days, 180 days and at 365 days was given for any evidence of MACES.

Results

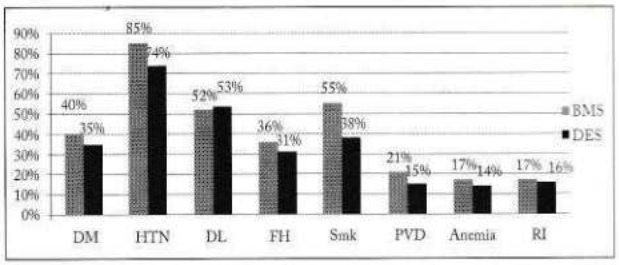
60 patients were randomly allocated to two groups. 30 patients [50%] to DES and 30 [50%] to BMS who had PCI and were followed up until death or their 1 year visit (365 days ±2 weeks) Patients were on average 78.4 years old and predominantly male 64% (table 1) in DES group; versus (81.3%) on average age in the BMS group with male preponderance 63%.

Table I : Age and sex distribution

	DES (Mean)	BM S (Mean)
Age	78.0%	81 .0%
Male	64.0%	63.0%

Fig I : shows the overall patient population had a high-risk profile typical for elderly patients, as hypertension, hypercholesterolemia, impaired renal function, previous myocardial infarction and anemia.

Fig I : Risk factors



The two groups were well balanced except for an excess of previous myocardial infarction in the DES group and more patients with hypertension and peripheral vascular disease in the group receiving a BMS than in those receiving a DES. The indication for PCI were Acute coronary syndrome starting from UA to STEMI with Carcinogenic shock and LVF.

Fig II : Indications

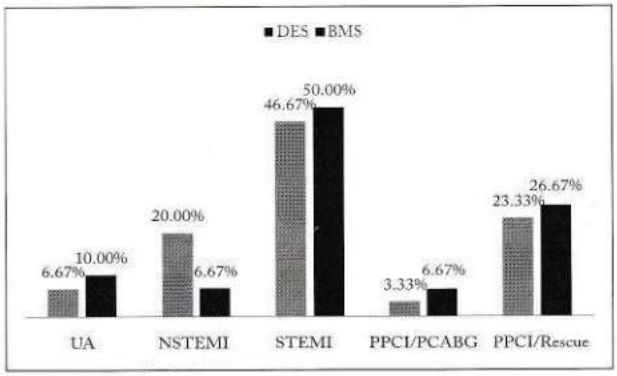


Fig III : Site of lesion

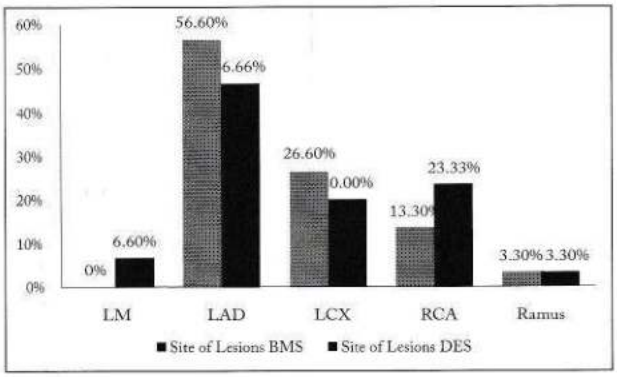


Fig 3 shows Left main stem PCI was uncommon but more frequent in the DES group (2/30 6.6% than in the BMS group. About 36%) patients in DES group and 29% in BMS group had multivessel disease and 8 (7%) had a staged procedure.

Among who received DES in Acute STEMI were 17 out of 30 patients (56.6%) to whom we performed Primary PCI or fascillated PCI or rescue Angioplasty which outnumbered STEMI and subsequent PCI in BMS group 15/30 (50%). Higher age range and multiple co morbidity like anemia and renal insufficiency were noted in BMS group who had PCI. As per lesion characteristics LAD is the most common involved vessel in both groups 19/30 (63.3%) patients in DES and 17/30 (56.6%) in BMS respectively. RCA involvement is more common in DES group 36% versus 13% in BMS . Two out of 30 patients in DES group had LM involvement.

Major adverse cardiac events was recorded and shown in Table 2 . Patients who received DES were mostly asymptomatic at 1 year (90% vs 66%) with 2 patients out of 30 in DES group needed ischemia driven repeat revascularization compared to 4 in BMS group. Sub acute stent thrombosis (SAT) were noticed in 3 patients(10%) in BMS, and no SAT in DES with 2 ISR (In stent restenosis) in BMS group in comparison 1 in DES. In the study patients in both the group, no patients had any major bleeding complications requiring blood transfusions. 1 patient had CVD in BMS group .

Table II : Maces

Mace	DES	BMS
Asymptomatic	90%	66.60%
Death	0%	3.30%
TLR	6.60%	13.30%
SAT	0%	10.00%
ISR	3.30%	6.60%

Discussions

Optimal medical therapy vs revascularization in the elderly in the analysis of 18,466 patients in the GRACE registry[14], of whom 16% were octogenarians showed that in-hospital outcomes inclusive of heart failure, recurrent ischemia, major bleeding and death were lower among the very elderly who had revascularization compared to those who had medical management. Furthermore, at the end of six months death, MI and MACE were significantly lower among those who underwent revascularization compared to medical therapy. Multiple logistic regression analysis confirmed the benefit of revascularization on the primary study endpoint (6-month stroke, death, MI) in the very elderly. [4,5,16.] In our study DES was associated with a 30% reduction in the occurrence of the composite primary endpoint of all-cause mortality, myocardial infarction, stroke, or revascularization at 1 year compared with recipients of a similar BMS. The benefit is mainly related to reduction in ischemia-driven target lesion revascularization at 1 year with the DES. Our study also shows reduced rate of TLR in DES group on short duration of anti platelets

Drug-eluting stents (DES) have rapidly replaced bare metal stents (BMS) for PCI treatment of CAD because of their superior capability to reduce restenosis and the need for target lesion and vessel repeat revascularization. A study comparing short and long term outcomes of elderly patients undergoing stenting with those of younger patients reported a higher rate of angiographic restenosis in the elderly (47% vs. 28%, P = 0.0007) [4,16.] This may be due to a higher incidence of ostial lesions, triple vessel disease, calcified lesions and complex lesions in the them compared to younger patients. These factors make the usage of DES often desirable in the elderly. Our study shows no SAT and only 3% ISR in patients who received DES and short duration of DAPT or SAPT with Ticagrel for 6 months.

With the establishment of DES, it was evident that DAPT had to be given for a longer time after stent implantation to avoid stent thrombosis. The greater burden of comorbid conditions in octogenarians makes them more susceptible to complications due to DAPT, while these patients also have more frequent need for interruptions of this treatment (e.g., during the peri-operative period for non-cardiac surgery)[5,13.] These safety concerns may be the reason why DES are used relatively less frequently in the very elderly.[16] . We noted in the present study no major bleeding complications , SAT or ISR in DES group with short 6 months duration of DAPT or SAPT with Ticagrel or Prasugrel.

A multicenter randomized trial undergoing stent placement for symptomatic patients has shown that use of second generation DES when compared with BMS reduces the incidence of MI and target vessel revascularization in the subsequent year. However, there was no impact on all-cause death, CVA, and major hemorrhage between the two groups[14,13.] Thus, in octogenarians with an indication of revascularization, current generation DES can be safely used, with some benefits in ischemic outcomes compared to BMS. There are emerging data indicating that for elective PCI, DAPT may be limited to as little as one or three months of continuation after second generation DES deployment, so concerns about having to use prolonged DAPT in elderly patients who are at risk of bleeding may not be as great as was traditionally the case. There are also ongoing studies to determine if shorter duration of DAPT can be used after PCI on ACS cohorts with new generation DES. All of this will impact on decision making as to whether to use DES instead of BMS. In our series patients with DES on DAPT for 6 months only were asymptomatic in 90% cases though some cases were on single anti platelets beyond 6 months up to 1 year including the patients on whom we carried out Primary PCI or Rescue Angioplasty.

Conclusion

Our study as well as other study shows that DES could be a good option in case of elderly patients undergoing a PCI with short at least 3 months DAPT regimens even patients who had undergone Primary PCI or Rescue Angioplasty.

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ORIGINAL ARTICLE

The Osmani Medical Teachers Association Journal Volume 17 Number 2

Antimicrobial Resistance Pattern of Acinetobacter Isolated from Different Clinical Samples in a Tertiary Care Hospital

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Abstract

Acinetobacter are aerobic Gram negative coccobacilli that are now an emerging important nosocomial pathogen. Nosocomial infections with Acinetobacter are being increasingly reported worldwide from debilitated and Critical care patients. Infections caused by them are difficult to control due to multidrug resistance, which limits therapeutic options. The purpose of this study was to know the antimicrobial sensitivity pattern of Acinetobacter isolated from tracheal aspirate, blood from central venous catheter, peripheral blood, urine, wound swab, IV and CV line swab of patients admitted in inpatients department of Sylhet MAG Osmani Medical College Hospital over a one year period from July 2016 to June 2017. A total 125 patient samples, comprised of 60 ICU samples and 65 Non ICU samples, were studied. Acinetobacter spp was isolated from was 9(15%) ICU patient and 1(3.8%) from non-ICU patient. This bacteria was found in Tracheal aspirates (21.6%), blood from central venous catheter (16.6%) in ICU and Urine (3.8%) from non ICU. Acinetobacter isolated from ICU samples were highly resistant (100%) to Amoxycillin, Ceforuxime, Ceftazidime, Cefepime and Aztreonam followed by lower resistant (88.8%) to Ciprofloxacin, Ceftriaxone and Tazobactam & piperacillin. Moderate rate of resistance to Gentamicin, Amikacin, and Imipenem was found 77.7%, 77.7% and 66.66% respectively. Acinetobacter from non ICU were 100% resistant to amoxycillin, gentamicin, ciprofloxacin, cefuroxime, ceftriaxone, ceftazidime, cefepime and aztreonam. But, irrespective of samples all the isolated Acinetobacter were found sensitive to Colistin both ICU and non ICU. Such findings yielded from this study will help our clinician to be more watchful about Acinetobacter infection and its management by specific antibiotic in any kind of health settings.

[OMTAJ 2018; 17 (2)]

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Introduction

Acinetobacter was considered previously as opportunistic pathogen but now a days it causes a number of outbreaks of nosocomial infections in hospitalized patients. Presently, this organism is considered to be responsible for 9 to 10 % of all hospital acquired infection[1]. It mostly infects patients with impaired host defense leading to increase in mortality and morbidity. It is responsible for a wide range of infection like nosocomial pneumonia, meningitis, endocarditis, skin and soft tissue infection, urinary tract infection, conjunctivitis, burn wound infections and bacteraemia[2]. Acinetobacter has been included in the family Neisseriaceae in Bergey's Manual of systemic bacteriology. More recent molecular taxonomic studies have resulted in the proposal that Acinetobacter should be classified in the new family Moraxellaceae[3]. The genus Acinetobacter is gram-negative, obligatory aerobic, catalase positive, oxidase negative, non-fermentative, non-motile, encapsulated coccobacilli. They are widely distributed in nature and commonly occur in soil and water [4]. This organism is transmitted through hands of hospital staff and is the major risk factor of colonization[5].

The skin carriage rate of Acinetobacter species has been found to be as high as 75 % [6] . The pathogenecity of the bacterium depends on the patient's immune system as well as site of infection. old people, premature children, new born, operated patients, individuals undergoing peritoneal dialysis, patients with tracheostomy tube, severely burned patients, those with tracheal intubations, mechanical ventilations, intravenous catheters and people who are treated with extended-spectrum antibiotics or immunosuppressive are more vulnerable to Acinetobacter infection[6]. A recent study in India showed that the distribution of Acinetobacter isolated from various sites of infection are 42.18% in Respiratory, 35.93% in Operative site, 9.37% in Urinary tract, 6.25% in Blood stream, 6.25% in Meninges leading to Meningitis[7].

A study conducted in BIRDEM hospital, Dhaka showed that major isolated organisms from intensive care units were Pseudomonas species, Acinetobacter species, Candida species, Escherichia coli and Klebsiella species[8]. Multidrug resistant Acinetobacter isolates is a growing problem and has been widely reported.

Resistance of Acinetobacter to majority of commercially avilable antimicrobials (aminoglycosides, cephalosporins, quinolones and imipenem) raises an important therapeutic problem[9]. Based on the increasing reports of Acinetobacter species isolated from patients, especially in ICU, and growth of Acinetobacter strains' resistance to new and available antibiotics and high cost of using antibiotics, recognizing the resistance patterns is necessary in every center. In this situation, choosing the right method of treatment requires knowing the periodic pattern of the resistance. in this study we aimed to examine the antimicrobial sensitivity pattern of Acinetobacter isolated from patients admitted in inpatients department at SOMCH (Sylhet MAG Osmani Medical College Hospital) Sylhet, Bangladesh over a one year period from July 2016 to June 2017.

Material and Methods

This cross-sectional descriptive study was carried out in the department of Microbiology in collaboration with the Inpatients department of Sylhet MAG Osmani Medical College Hospital from 1st July 2016 to 30th June 2017. A total 125 patient samples, 60 from ICU and 65 from Non ICU, were enrolled in this study. Samples (blood, urine, tracheal aspirates, wound swab, IV and CV line swab) were processed for isolation and identification of Acinetobacter by standard microbiological methods. Samples which showed growth in culture were taken into consideration for identification by colony morphology, staining and biochemical test. The Kirby Bauer's modified disc diffusion test was used to determine the antimicrobialsusceptibility and resistance patterns of the isolated Acinetobacter. The Clinical and Laboratory Standards Institute (CLSI, former NCCLS)10 was followed while performing the sensitivity test by using some common drugs.

Results

Out of 125 samples, 10 (8%) Acinetobacter were positive by culture and microscopy. Out of 60 ICU samples and 65 Non ICU samples Acinetobacter isolates were found 9(15%), and 1(3.8%) respectively. Acinetobacter isolates were predominant in Tracheal aspirate. Acinetobacter isolates were resistant to frequently used antibiotics(Amoxycillin, Gentamicin, Ciprofloxacin, Ceforoxim, Ceftriaxone, Ceftazidime, Cefepime). Colistin was found to be better efficacious drugs against Acinetobacter (after susceptibility testing) especially in ICU patients.

Table I: Acinetobacter isolated from ICU samples (n=60).

Types of samples	Number of samples	Isolates (n,%)
Urine	26	1(3.8%)
Wound swab	30	0
IV canula swab	9	0
Total	65	1(1.5%)

Table II: Acinetobacter isolated from non ICU samples (n=65).

Types of samples	Number of samples	Isolates (n,%)
Tracheal aspirates	37	8(21.6%)
Blood CVC	6	1(16.6%)
Peripheral Blood	6	0
CV line swab	8	0
IV canula swab	3	0
Total	60	9 (15%)

Acinetobacter isolated from ICU samples were highly resistant to Amoxycillin, Cefuroxime, Ceftazidime, Cefepime and Aztreonam (100%) followed by Ciprofloxacin, Ceftriaxone and Tazobactam & piperacillin (88.8%). Moderate rate of resistance to Gentamicin, Amikacin, and Imipenem was found 77.8%, 77.8% and 66.7% respectively. But all the isolated Acinetobacter were 100% sensitive to Colistin. (Table III).

Acinetobacter isolated from non ICU were 100% resisstant to amoxycillin, , ciprofloxacin, cefuroxime, ceftriaxone, ceftazidime,cefepime and aztreonam. on the other hand colistin,imipenem,amikacin and tazobactam & piperacillin were 100% sensitive.

Table III : Showing antimicrobial resistance pattern of isolated Acinetobacter

Antibiotic		Isolated bacteria Acinetobacter		
		ICU (n=9)	Non ICU) (n=1)	
Amoxycillin	0	9(100%)	0	1(100%)
Gentamicin	2(22.2%)	7(77.8%)	0	1(100%)
Amikacin	2(22.2%)	7(77.8%)	1(100%)	(0%)
Ciprofloxacin	1(11.1%)	8(88.9%)	0	1(100%)
Cefuroxime	(0%)	9(100%)	0	1(100%)
Ceftriaxone	1(11.1%)	8(88.9%)	0	1(100%)
Ceftazidime	0	9(100%)	0	1(100%)
Cefepime	0	9(100%)	0	1(100%)
Colistin	9(100%)	0%	1(100%)	(0%)
Imipenem	3(33.3%)	6(66.7%)	1(100%)	(0%)
Aztreonam	(0%)	9(100%)	(0%)	1(100%)
Tazobactam & piperacillin	1(11.1%)	8(88.9%)	1(100%)	(0%)

Discussion

Multi approach hospitals are used to deal with patients with various kinds of ailments who were conglomerated

under the same roof and served by the same hospital staff. Critically ill patients in intensive care unit are at a higher risk of health care associated infection due to multiple causes including disruption of barriers to infection by endotracheal intubation and tracheostomy, urinary bladder catheterization and central vascular catheterization[11]. This research work was designed to isolate and identify Acinetobacter and to determine antimicrobial sensitivity pattern of isolated Acinetobacter. In the present study, the prevalence of Acinetobacter isolated from various clinical samples was 8% (n=10). This was found in accordance with the prevalence of the study by Wankhede et al. (2016)2, Oberoi et. al (2009)[12] and Jaggi et. al (2011)[13]. They reported the prevalence of Acinetobacter were 9%, 8.4% and 11% respectively. The wide variations of prevalence of Acinetobacter species might be due to variations in geographical distribution as well as difference in antibiotic policy used.

In this study, 125 samples were studied, of which the isolated organisms were Escherichia coli (40.8%) followed by Klebsiella (11%), Pseudomonas (10%), Acinetobacter (8%) Staphylococcus spp. (8%), Streptococcus spp. (1.6%), Proteus spp. (0.8%) and 0.8% Moraxella. The findings were in consistent with the study done by Nahar et al. (2010)[14]. Where predominant isolations was Gram negative bacteria such as pseudomonas spp. (21.5%), followed by Acinetobacter spp. (20.3%), Klebsiella spp. (9.4%), Escherichia coli (8.2%), Staphylococcus Spp. (4%) and Proteus spp. (2%). In this study, 15% Acinetobacter were isolated from different ICU samples which was were in consistent with a study of Patwardhan et al. 2008[15], where Acinetobacter was reported for about 13.2% of nosocomial infections in ICU patients. Nahar et al. (2010)[14], found isolation rate of Acinetobacter in ICU was 33.3% and In BIRDEM hospital, 27.5% Acinetobacter species were isolated from different ICU samples.

In our study majority of Acinetobacter isolated from different samples showed resistance to more than one groups of antibiotics. A study from India revealed 87% isolates were Multidrug resistant and 20% carbapenem resistant[16]. A study from ICUs in Mazandaran, Northern Iran revealed resistance rate of Acinetobacter to meropenem were 96% and 76% were resistant to imipenem. Another study from India conducted in Uttarakhand hospital showed 74% carbapenem resistance, while carbapenem (imipenem) resistance in our study was 66.66% (ICU).

In our study 88.8% resistance (ICU) was observed to ceftriaxone, piperacillin-tazobactum. These findings are similar to findings of Ghasemia et al. 2016[17] who observed 86% resistance to these drugs. In the ICU based study by Patwardhan et al [15]. 2007 the resistance was 96% to these drugs. This indicates that there is more resistance in ICU strains. High levels of resistance were seen in our study for amoxycillin (100%), aztreonam (100%), cefuroxime (100%), cefepime (100%) and ceftazidime (100%). Significant levels of resistance were also recorded for tazobactam & piperacillin (88.8%), ceftriaxone (88.8%), Ciprofloxacin (88.8%) Gentamicin (77.7%) and amikacin (77.7%). Nahar et al. (2010)[14] reported resistance rates of 81%, 85%, 98%, 96%, 100%, and 82% for imipenem, amikacin, piperacillin-tazobactam, ceftriaxone, gentamicin and ciprofloxacin respectively.

BIRDEM hospital showed that, Acinetobacter species were 100% resistant to pipercillin, Higher resistance was seen for ceftriaxone (98.2%), gentamicin (93.2%), aztreonam (91.6%), amikacin (81.4%), and imipenem (72.4%)[18]. In our study colistin sensitivity 100% was seen in both ICU and non ICU samples. These findings were consistent with the study done by Dimple et al. (2016)[19], Nahar et al. (2010)[14] and Ghasemian et al (2016)[17]. Susceptibilities of Acinetobacter against various antimicrobials are considerably different among countries, centers and even among different ward of the same hospital, such type of local surveillance studies are around important in deciding the most adequate therapy for Acinetobacter infections [20].

In conclusion, Acinetobacter is emerging as multi-drug resistant nosocomial pathogens mainly affecting the patients with impaired host defences and prevalence is much more in ICU, where the selective pressure of antibiotics is already high.. This indicates infections caused by Acinetobacter were become difficult to treat day by day.These drug resistant infections can be minimized to a some extent by judicial use of antibiotics and adopting strict infection control policies.

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ORIGINAL ARTICLE

The Osmani Medical Teachers Association Journal Volume 17 Number 2

Role Of Sonography In The Evaluation Of Leg Pain And Swelling A Study Of 100 Cases

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Abstract

This study was carried out to determine the frequency of different causes of painful swollen leg in patients referred for sonographic examination. This was a descriptive study, carried out at the Department of Radiology, Sylhet MAG Osmani Medical College Hospital and Popular medical centre, sylhet, Bangladesh from May 2016 to November 2017. A total of 100 consecutive patients presenting with painful swollen lower limb from 23 to 83 years of age of both sexes were included in the study. Each of these patients underwent sonographic examination with GE Volusion E8 and GE P8 Color / Power Doppler ultrasound machine having 7.5 MHz linear probe.Out of 100 patients, 33% were male and 67% were female. Mean age of the patients was 58.09 years. The common causes of painful swollen leg were DVT 52%, cellulitis 13% intramuscular abscess 10%, , ruptured baker's cyst 9% and intramuscular hematoma was in 7% of patients. Deep vein thrombosis was the commonest cause of painful swollen leg in our population.

[OMTAJ 2018; 17 (2)]

Introduction

Painful swollen leg may be due to a variety of underlying causes. The most common differentials are deep venous thrombosis (DVT), cellulitis, hematoma and ruptured Baker's cyst. Other causes may include muscle contusions, abscess, arterial aneurysms, sarcomas and Achilles' tendonitis[1,2]. Ultrasound is a very precise device for accurately identifying non-traumatic painful swollen leg. It also has the additional benefits of being least expensive, easily available, portable, convenient, lacking radiation and having real time imaging capabilities[3]. On sonographic examination, DVT is considered commonest cause (44.8%) of patients with painful swollen leg[4]. Batool et al similarly reported deep vein thrombosis in 46 % of patients[5]. The most frequent non-vascular etiology observed on sonography is considered to be Baker's cyst, being reported in 3% of patients[6]. Clinically both DVT and ruptured Baker's cyst may present as painful swollen leg[7]. Moreover, both of these can be present in 3% of patients[8]. Accurate diagnosis is very vital in a patient presenting with painful swollen leg because blind anticoagulation without radiologic confirmation can have disastrous consequences. Since no data regarding the frequency of different causes of painful swollen leg is available in the local medical journals, the results of this study will be very helpful to the physicians and other health professionals to understand the probability of certain diagnoses in patients presenting with painful swollen leg.

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[Material and Methods

This study was carried out in the Department of Radiology & Imaging, Sylhet MAG Osmani Medical College Hospital and Popular Medical centre, Sylhet, Bangladesh from May 2016 to November 2017. Through a descriptive cross sectional study design, a total of 100 patients presenting with painful swollen lower limbs and subjected to ultrasound to identify underlying causes. Standard protocol for musculoskeletal and venous ultrasound (grey scale and color / power Doppler) was adopted. GE Volusion E8 and GE P8 machine (with color / power Doppler functions) with 3.5 MHz curvilinear and 7.5 MHz linear probes were used. All patients with history and clinical features suggestive of soft tissue tumor of calf were biopsied. For quantitative variables mean ± standard deviation was calculated, like age etc. For sex, male-to-female ratio was calculated. For other qualitative variables like different causes of painful swollen leg on sonographic examination, frequency and percentages were calculated. The results were expressed / presented through frequency tables and graphs. All the data were analyzed by using computer program, SPSS version 20.

Result

A total of 100 patients presenting with painful swollen leg and referred to ultrasound department were included. There were 67 (67%) females and 33 (33%) males in our sample. (Figure 1) Minimum age of the

patients was 23 years and maximum age was 85 years. The mean age was 58.09 years with a standard deviation of 15.71. Age distribution is shown in Table I. Table II demonstrates various findings on sonographic examination of the patients presenting with painful swollen leg. Deep vein thrombosis was found in 52 patients (52%), cellulitis was 13(13%), abscess 10(10%) and ruptured Bakers cyst was 9 patients (9%). Gender wise and age wise stratification of the findings were shown in table III and table IV.

Figure 1: Gender distribution of the sample(n=100)

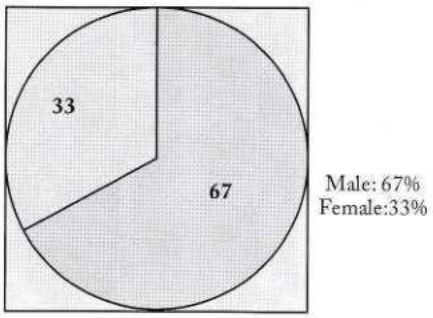


Table I : Age distribution of the sample (n=100)

age ranges(in years)	No. of cases	percentage
23-50	28	28
51-75	43	43
>75	29	29
total	100	100%

Table II: Findings of sonographic examination (n=100)

Mode	No of patients	percentage
Deep vein thrombosis	52	52
Tendon tear	6	6
Ruptured Baker cyst	9	9
Intramuscular hematoma	7	7
intramuscular abscess	10	10
popliteal artery aneurysm	2	2
Cellulitis	13	13
Soft tissue sarcoma	1	1
Total	100	100

Table III: Gender wise stratification of the findings (n=100)

Mode	Male	Female	Total
Deep vein thrombosis	17(32.7%)	35(67.3%)	52
Tendon tear	2(33.3%)	4(66.6%)	6
Ruptured Baker cyst	3(33.3%)	6(66.7%)	9
Intramuscular hematoma	2(28.6%)	5(71.4%)	7
intramuscular abscess	4(40%)	6(60%)	10
popliteal artery aneurysm	1(50%)	1(50%)	2
Cellulitis	4(30.8%)	9(69.2%)	13
Soft tissue sarcoma	0(0.0%)	1(100%)	1
Total	33	67	100

Table IV: Age group wise stratification of the findings (n=100)

Mode	23-50 yrs	51-75 yrs	>75 yrs	total
Deep vein thrombosis	8(15.3%)	32(61.56%)	12(23.1%)	52
Tendon tear	4(66.7%)	2(33.3%)	0(0%)	6
Ruptured Baker cyst	3(33.3%)	2(22.2%)	1(11.1%)	9
Intramuscular hematoma	4(57.1%)	2(28.6%)	1(14.3%)	7
intramuscular abscess	3(30%)	2(20%)	5(50%)	10
popliteal artery aneurysm	1(50%)	0(0%)	1(50%)	2
Cellulitis	2(15.3%)	3(23.1%)	8(61.5%)	13
Soft tissue sarcoma	0(0%)	0(0%)	1(100%)	1
Total	28	43	29	100

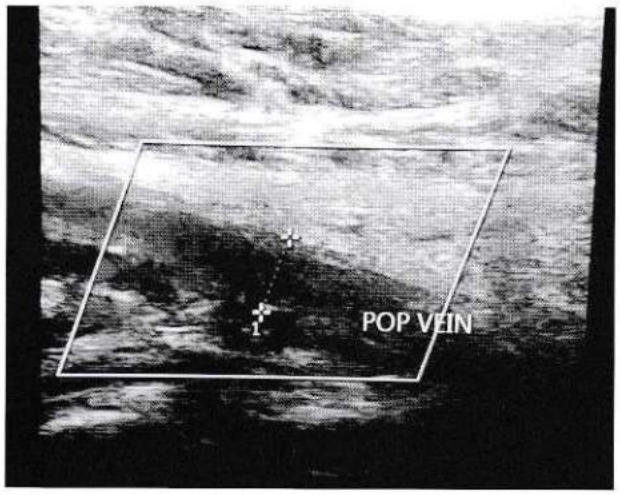


Figure 1 : Sonographic image with color Doppler showing acute hypoechoic thrombus within the popliteal vein causing complete occlusion of the lumen.

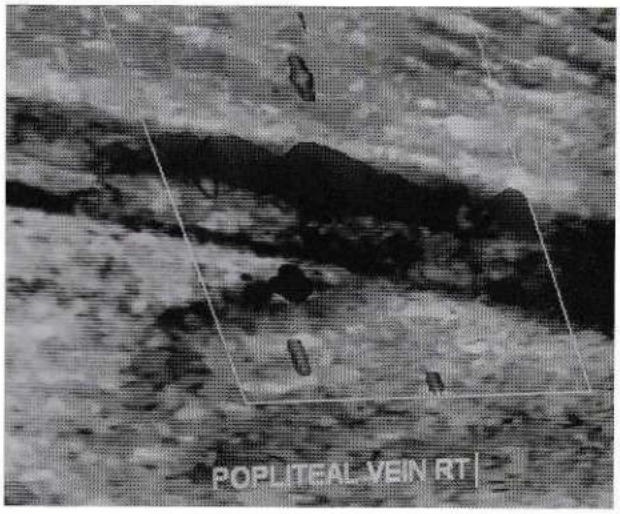


Figure II. Sonographic image with color Doppler showing hypoechoic thrombus within the popliteal vein with partial occlusion of the lumen .

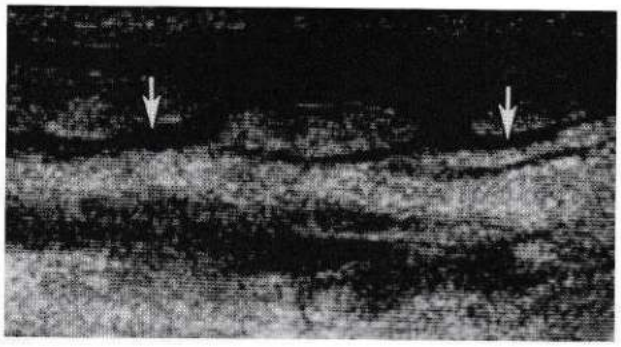


Figure III : Sonographic image of the calf showing cellulitis

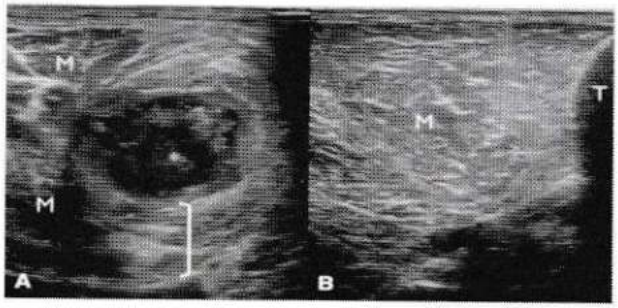
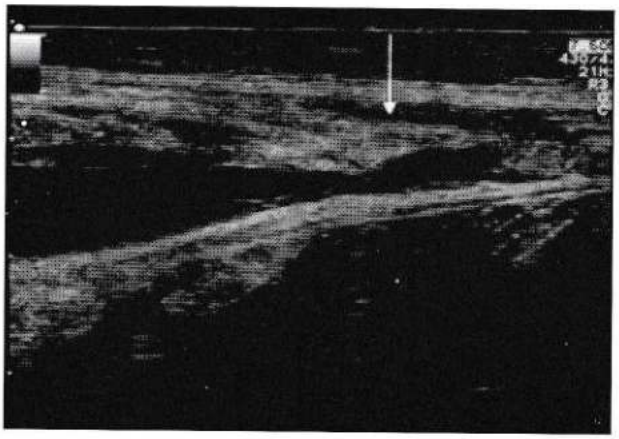


Figure IV : (A) Ultrasound of patient's left calf showing abscess. (B) Right calf, showing normal muscle appearance (M) with adjacent tibia bone (T).



Fig; I: Sonographic image shows ruptured Baker's cyst

Discussions

It is of paramount importance to accurately diagnose the underlying causes of painful swollen leg as these may mimic each other clinically[9,10]. Dynamic assessment is possible with real time imaging capabilities of ultrasound which is helpful in diagnosing and differentiating several vascular disorders[11,12] and is considered a superior diagnostic modality in painful swollen legs[12-14]. However, therapeutically these all are different. While stratifying the findings on sonographic examination with regards to gender, it was observed that most of the findings were seen in male gender perhaps since their predominance in the sample as well as high prevalence in male population. Deep vein thrombosis was found predominantly among women compared to men (67.3% vs 32.7%) , intramuscular abscess and cellulitis was found more in women than men (60% vs 40%) (69.2% vs 30.8%) respectively. The rest of the findings were more or less same in both gender (Table No. III) Ball reported the frequency of the various common causes of unilateral leg swelling as follows: 16 to 30 % for deep vein thrombosis, 6 to 9 % for cellulitis, 6 to 7 % for muscular injury, 5 to 7 % for superficial thrombosis and 2 to 6 % for ruptured Baker's cyst[15,16].

Batool et al found deep venous thrombosis (DVT) as the cause of painful swollen leg in 46% of the patients[5]. In our study, we found DVT in 52% patients and was the commonest cause of painful swollen leg. As the age advances, the DVT risk is elevated[5,17]. Whereas in our study too, it was most frequent in the 25-75 years age group. In study by Vucaj-Cirilovi? et al[18], 860 patients were examined over a period of 2 years by duplex Doppler ultrasound, and among these, 619 (72%) were female and 241 (28%) male, with the age-range of 16-91 years (mean 56.2). The life-time prevalence of DVT is 3.1% and increases towards older age groups, and it is higher in female (3.5%) compared with men (2.4%)[19]. Patients with DVT had a mean age of 58 years. Like other studies, majority of our patients were >50 years (72%). There were 33 (33%) male patients and 67 (67%) female patients. We noticed an increasing of DVT with age; swollen, painful limb was the commonest presentation. Ruptured Baker's cysts may present in the emergency department and need to be diagnosed and differentiated from DVT[20]. Sato et al[4], reported ruptured Baker's cysts in 03 patients, with an incidence of 2.4%, while in our study it was observed in 9 %.

Conclusion

Deep vein thrombosis is the most frequent cause of painful swollen leg followed by cellulitis, abscesses and baker's cyst.

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ORIGINAL ARTICLE

The Osmani Medical Teachers Association Journal Volume 17 Number 2

Disease Pattern of Patients attending to the Department of Physical Medicine & Rehabilitation , SOMCH.

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Abstract

Physical Medicine & Rehabilitation (PM&R) provides integrated care in the treatment of wide range of problems related to brain, nerves, muscles and bones. The aim of this study was to explore the pattern of diseases among patients attending to the department of Physical Medicine of SOMCH, in order to increase the awareness among doctors and other health service providers regarding services provided by the Physical Medicine Department. This retrospective study was done using the records of patients attended in this department during the period from 1st January2013 to 31st December 2017.Of total 104,948 patients attended 60,329 were male (57.48%), 44,619 were female (42.52%). Age varied from 06 months to 95 years, most of patients were 40-50 years age group. Majority of patients presented with pain of various etiology, predominantly with musculoskeletal pain and neurologic disorder. Most patients were self motivated to attend Physical Medicine outpatient department. Awareness is essential for timely referral and appreciation of the role of Physical Medicine in patient care. Disease Pattern, Physical Medicine, Musculoskeletal Pain, Neurological Disorder.

[OMTAJ 2018; 17 (2)]

Introduction

Physical Medicine and Rehabilitation (PM&R), also called Physiatry, is the branch of medicine emphasizing the prevention, diagnosis and treatment of disorders-particularly related to nerves, muscle and bones- that may produce temporary or permanent impairment. PM&R provides integrated care in the treatment of wide range of problems related to the brain, nerves, muscles and bones. The goal is to decrease pain and enhance performance without surgery. Rehabilitation physicians are sometimes referred to as PM&R physician or physiatrist. Specific diagnostic tools of Rehabilitation Physicians are the same as those used by other physicians (Medical history, Physical examinations and Imaging studies) with the addition of special techniques in Electrodiagnostic medicine like Electromyography (EMG), nerve conduction studies and somatosensory evoked potentials to diagnose conditions that cause pain, weakness and numbness. A treatment plan designed by a Physiatrist can be carried out by the patients themselves or with the help of the rehabilitation physician's medical team. This interdisciplinary medical team may include medical professionals such as Neurologists, Psychiatrists, Orthopedic surgeons, Urologists and non-physician health professionals such as Physical therapists, Occupational therapists, Speech therapists, Vocational counselors, Psychologists and Social workers. The team is different for each patient and the team's composition changes during treatment to match the patient's shifting needs. By providing an appropriate treatment plan, rehabilitation physicians help patients stay as active as possible at any age. Their broad medical expertise allows them to treat disabling conditions throughout a person's lifetime.[1]

There are many conditions, diseases and injuries that require clinical care by a physiatrist or other rehabilitation healthcare professional. Physical medicine is involved with management of clinical problems like musculoskeletal disorders, cerebrovascular disease, burns, chronic obstructive pulmonary disease, chronic pain, back and neck pain, multiple sclerosis, spinal cord injury, peripheral neuropathy, osteoporosis, amputation, repetitive motion injury, sports related injuries etc.[2] There are few studies so far searched regarding the pattern of patients treated in a physical medicine department in an institute having such facility in our country. General physicians are not aware of scope of management of chronic pain and improvement of disability as a consequence of injury or neurological problems. The aim of this study was to explore the pattern of diseases among the patients attending to the Department of Physical Medicine of SOMCH, in order to increase the awareness among doctors and other health service providers regarding services provided by the Physical Medicine department.

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Material and Methods

It was a five years retrospective study conducted in the Department of Physical Medicine of Sylhet Osmani Medical College Hospital, Sylhet from 1st January2013 to 31st December 2017. Data were extracted from the record and demographic data was documented along with the disease/diagnosis. Only diagnosed patients were included. The patients with the symptoms related to other medical disciplines were excluded.

Results

Total no of patients 104948 attendant in Physical Medicine and Rehabilitation department, SOMCH from 1st January'2013 to 31st December' 2017. Male patients were 60329 (57.48%), and Female 44619 (42.52%). Table 1. 2 & 3 presents Sex distribution & pattern of disease of patients attending Physical Medicine Rehabilitation Department, SOMCH.

Table I: Sex distribution of patients attended to Physical Medicine & Rehabilitation Department from 2013 to 2017.

Sex	2013	2014	2015	2016	2017	Total	Percentages
Male	4373	5017	9390	15852	25697	60329	57.48 %
Female	2396	2600	4996	13036	21591	44619	42.52 %
Total	6769	7617	14386	28888	47288	104948	100 %

Table II: Percentage of Disease pattern attending Physical Medicine and Rehabilitation Department, SOMCH from 1st January 2013 to 31st December 2017.

S. No.	Name of the disease	Grand total	Percentages
1	Low back pain (Mechanical)	10982	10.46%
2	Adhesive capsulitis	9388	8.95%
3	Osteoarthritis knee	8944	8.52%
4	Cervical spondylosis	7980	7.60%
5	Lumber spondylosis	6520	6.20%
6	Plantar fascitis	4460	4.25%
7	Cerebrovascular disease	5176	4.93%
8	PLID	4780	4.55%
9	Tennis elbow	3606	3.44%
10	Lumber radiculopathy	4093	3.90%
11	Bells palsy	3470	2.89%
12	Post traumatic contracture	3340	3.18%
13	Cervical radiculopathy	3644	3.47%
14	GBS	2674	2.55%
15	Rheumatoid arthritis	2288	2.18%
16	Ankylosing spondylitis	2132	2.03%
17	Osteoporosis	1336	1.27%
18	Fibromyalgia syndrome	2358	2.42%
19	Torticollis	2196	2.09%
20	Cerebral palsy	1828	1.74%
21	Trigger finger	1450	1.38%
22	Carpal tunnel syndrome	938	.89%
23	Peripheral neuropathy	1014	.97%
24	Post burn contracture	1050	1.00%
25	Gout	1314	1.25%
26	Others	7997	7.62%
27	Grand total	104948	100%

Table III: Disease pattern attending Physical Medicine and Rehabilitation Department, SOMCH from 1st January 2013 to 31st December 2017.

SI.	Name of the Disease	2013	2014	2015	2016	2017
1	Adhesive capsulitis	616	586	1201	2692	4292
2	Low back pain (Mechanical)	570	596	1166	3525	5125
3	Knee osteoarthritis	573	559	1132	2440	4240
4	Cervical spondylosis	540	548	1088	2227	3577
5	Lumber spondylosis	466	499	965	1620	2970
6	Lumber radiculopathy	347	350	697	1030	1669
7	Cerebrovascular disease	330	228	55	1505	2555
8	Cervical radiculopathy	266	290	556	816	1716
9	Fibromyalgia syndrome	267	275	542	437	837
10	Tennis elbow	243	255	498	1030	1580
11	Guillain barre' syndrome	253	232	485	702	1002
12	Torticollis	259	215	474	424	824
13	Bell's palsy	224	228	452	1008	1558
14	PLID	238	198	436	1404	2504
15	Plantar fascitis	207	224	431	1524	2074
16	Post traumatic contracture	199	223	422	823	1673
17	Cerebral palsy	136	168	304	360	860
18	Rheumatoid arthritis	114	148	262	627	1127
19	Ankylosing spondylitis	110	146	256	560	1060
20	Gout	68	104	172	235	735
21	Trigger finger	72	88	160	315	815
22	Peripheral neuropathy	65	93	158	249	449
23	Osteoporosis				518	818
24	Carpal Tunnel syndrome				309	609
25	Post Burn Contracture				275	775
26	Others	606	1364	1970	2213	1844
27	Grand Total	6769	7617	14386	28888	47288

Discussion

Most of the patients had musculoskeletal diseases. Among all the patients knee osteoarthritis was the predominating cause attending physical medicine department. Walid et all study presented musculoskeletal disease (1807, 74.80%) followed by neurological disease (608, 25.20%).[3] Majority of the patients in this study (89568, 85.63%) presented with musculoskeletal diseases followed by neurological disease (15080, 14.37%). Among total attended patients, low back pain (Nonspecific) predominated (10,982, 10.46%). Low back pain hampered the normal activities of life & restricted movement. Physical medicine which encompasses a number of modalities, is a non-invasive treatment option in management of all muscuioskeletal diseases like Low

back pain (10982 , 10.46%), Adhesive capsulitis (9388, 8.95%), Osteoarthritis knee (8944, 8.52%), Cervical spondylosis (7980, 7.60%), Lumber spondylosis (6520, 6.20%), Rheumatoid arthritis (2288,2.18%). If these diseases are early diagnosed and treated under physical medicine and rehabilitation department with various modalities, it is easy to prevent a lot of complication & disability of patients. Physical Medicine, which encompasses anumber of modalities is a non-invasive treatment option in the management of OA. Effectiveness od its different modalities is independent of presence or severity of X-ray findings.[5] Among 15080 (14.37%) Neurological disease patients, there were 5176 Stroke patients.

Physical Medicine & Rehabilitation has a great role to facilitate motor recovery and to optimize mobility, activities of daily living and cardiovascular endurance in the wake of a cerebral infarct 5,6. Besides this Bell's palsy (3470, 2.89%.....), GBS (2674, 2.55%...), Cerebral palsy (1828,...1.74%..) patients attended in Physical Medicine Department during this study period. Physical Medicine & Rehabilitation department has a great role to facilitate motor recovery and to optimize mobility infarct6,7, activities of daily living and cardiovascular endurance in the wake of a cerebral for proper management of these type of disease, for early recovery & prevention of various complications. Most of the patients in this study were not referred by physicians of different speciality. They attended by themselves with history of unsatisfactory improvement of some musculoskeletal or neurological problems treated by other specialities. Physicians are not well aware about the scope of spectrum of management of special Branch of Medicine.

In fact this Rehabilitation medicine treats a wide range of diseases, aims to enhance and restore functional ability and quality of life to those with physical impairment and disability. A physiatrist (Physical Medicine & Rehabilitation Specialist) is specialized in restoring optimal function to people with injuries to the muscle, bones, tissues, nervous system as well as various disabling musculoskeletal diseases and chronic pain management. Neurologist, Orthopedic Surgeon, Neurosurgeon, Rheumatologist, General Surgeon or a General Physician may refer to a Physiatrist for long term management of disability and chronic pain of varied etiology. It is logical to seek opinion of a physiatrist from the very beginning of management of conditions that are potentially less responsive to conventional medical treatment alone. So, awareness is essential for timely referral and appreciation of the role of Physical Medicine in patient care.

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ORIGINAL ARTICLE

The Osmani Medical Teachers Association Journal Volume 17 Number 2

Relationship of serum gamma- glutamyltransferase level and insulin resistance in adult obese female

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Abstract

Higher serum hepatic enzymes level has been reported in obese individuals of many countries of the world which may be an expression of excess deposition of fat in liver. Serum gamma- glutamyltransferaselevel may serve as a marker of insulin resistance and predict the development of metabolic disease like type 2 diabetes in obese individuals.To assess the relationship betweenserum gamma- glutamyltransferase level and insulin resistance in adult obese female, this cross sectional study was conducted in the Department of Physiology, Dhaka Medical College (DMC), Dhaka from July 2014 to June 2015. A total number of 100 female subjects aged 20 to 40 years were selected by personal contact from different areas of Dhaka city. Among them, 50 obese female subjects were included in the study group and age matched 50 healthy non-obese female subjects were considered as control in this study. Serum gamma-glutamyltransferase(GGT) level was measured by continuous spectrophotometric IFCC method, fasting serum glucose was estimated by glucose oxidase (GOD/PAP) method, fasting serum insulin was estimated by ELISA using semi automatic hormone analyzer and insulin resistance was calculated by HOMA-IR using HOMA software. For statistical analyses unpaired Student's't' test was used and Pearson's correlation coefficient (r) tests were performed as applicable. In this study, serum GGT level and HOMA-IR were significantly (P<0.001) higher in obese female than that non-obese. Serum GGT level and HOMA-IR showedpositive correlation with BMI and WHR. From this study, it is concluded that serum GGT leveland insulin resistance (HOMA-IR) are directly related with obesity.

[OMTAJ 2018; 17 (2)]

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Introduction

Obesityis defined as a state of increased body weight specially adipose tissue to produce adverse

healthconsequences1. It is a major risk factor for the development of several non-communicable diseases, significant disability and premature death2. It is the 6th most important risk factor contributing to the overall burden of disease worldwide3.

Obesity is expressed in terms of body mass index (BMI) which is a simple index to classify obesity. According to WHO (2014), a BMI ? 30 kg/m2 is considered as obese4. In Asian population, the co-morbidities of obesity occur at a lower BMI than in other ethnic groups of the world. Thus, on the basis of the respective health-related risk factors, in Asian populations BMI ? 25.0 kg/m^2 is considered as obese 5,6. Moreover, waist circumstances > 88cm7 and waist hip ratio > 0.85 in female are the cut off point for obesity8. The prevalence of obesity shows significant variation by racial and ethnic groups 6. Obesity is present in 34.9% of adults living in the U.S.9 and 1.4% in Bangladesh10.

Obesity is one of the leading risk for global deaths. Around 3.4 million adults die each year as a result obesity. Raised BMI is a major risk factor for noncommunicable diseases such as cardiovascular diseases, diabetes mellitus, musculoskeletal disorders (especially osteoarthritis) and some cancers 11. For each 5 kg/m2 increase in BMI, the mortality from stroke and coronary heart disease increased by 50%12.

Obesity is strongly associated with non alcoholic fatty liver disease (NAFLD) which may progress to cirrhosis and liver failure13. Circulating hepatic enzymes, commonly gamma glutamyltransferase (GGT), are found to be elevated in obese subjects14. Elevated serum GGT level may be an expression of excess deposition of fat in liver15,16.

Insulin resistance is defined as a condition in which insulin's target organs are resistant to its action, so that higher concentrations of this hormone are needed to achieve a normal biological effect. The homeostasis model assessment of insulin resistance index [HOMA-IR = fasting insulin (?IU/mL) × fasting glycemia (mmol/L)/22.5] can be considered as the bestnon invasive surrogate marker of insulin resistance17. HOMA-IR >2 was considered as insulin-resistant in obese subjects 18.

Several studies reported that serum GGT level was significantly elevated in obese subjects than non obese and showed significant correlation with insulin resistance. Moreover, raised serum GGT level may serve as a marker of insulin resistance which may predict the future risk of development of type 2 diabetes. But some researchers did not find significant relation with the body weight and serum GGT level and insulin resistance(HOMA-IR).

From the above studies, it has been observed that, the result is conflicting. So the precise nature of relationship of serum GGT level & insulin resistance (HOMA-IR) in obese individual is still unknown. Therefore this study has been designed to assess the relationship between serum GGT level and insulin resistance in obese female.

Methods:

The present cross sectional analytical study was carried out in the Department of Physiology, Dhaka Medical College, Dhaka from July 2014 to June 2015. Protocol of this study was approved by Ethical Review Committee of Dhaka Medical College. A total number of 100 female subjects aged 20 to 40 years were included in this study. Among them 50 apparently healthy obese female with BMI 25-39.9Kg/m2and WHR >.85 were included in the study group and age and sex matched 50 healthy subjects with BMI<25Kg/m2and WHR<.85 were considered for comparison. They were selected by personal contact from different areas of Dhaka city. The objectives, nature, purpose, benefit and risk of the study were explained to the subject in details. Before taking blood, detailed medical history was taken and a careful medical examination was performed. All the subjects were excluded fromdiabetes mellitus, hypertension or any other endocrine diseases.Standing height, weight, waist and hip circumference were measured using soft non elastic measuring tape. Height measurement started from top of crown then to the back of the head, thoracic spine along the trunk, buttocks up to heels. Height, waist and hip circumference were recorded in centimeter (cm). A standard weight measuring device was placed on a hard flat surface and checked for zero balance before measurement. Weight was recorded in kilogram (kg). Body mass index (BMI) of the subjects were calculated using standard formula, BMI = Weight (kg) / Height $(m)^2$. The waist circumference was taken in a standing position. It is the horizontal circumference between the lower border of the 12th rib and the highest point of the iliac crest on mid-axillary line at the end of normal expiration. The hip circumference is the horizontal circumference at the highest point of buttock at the level of greater trochenter of head of femour. Waist hip ratio was calculated from standard formula, WHR: Waist circumference (cm) /Hip circumference (cm).All the information's were recorded on the structured data collection form. After overnight fasting, 5 ml ofvenous blood was collected at 8 am from every subject for estimation of serum glucose, serum insulin and serum GGT level.Serum gamma-glutamyltransferase (GGT) level was measured by continuous spectrophotometric IFCC method, fasting serum glucose was estimated by glucose oxidase (GOD/PAP) method, fasting serum insulin was estimated by ELISA using semi automatichormone analyzer and insulin resistance was calculated by HOMA- IR using HOMA software. For statistical analysis unpaired Student's't' test and Pearson's correlation coefficient (r) tests were performed by using SPSS version 20.

Result:

The baseline characteristics are presented in Table I.

In this study, BMI and WHR were significantly higher in obese female than healthy female. Systolic blood pressure, diastolic blood pressure and pulse were almost similar in obese and healthy female. But serum GGT level and insulin resistance (HOMA-IR) were significantly higher in obese (Table II).

This study showed that elevated serum GGT level (>30U/L) was found in 62% obese female (Figure I).

Moreover, 50 (100%) of the study subjects were found insulin resistant (HOMA-IR>2) (Figure II).

Correlation analysis showed significant positive correlation of BMI with serum GGT level and HOMA-IR (Figure III).

Serum GGT level and HOMA-IR were positively correlated with WHR but the relationship was statistically significant only in case of serum GGT level(Figure IV).

Moreover, serum GGT level showed positive correlation with HOMA-IR in study group but it was not significantly positive (Figure V).

Table I: General characteristics in both groups(n=100)

Non-obese Parameters	(n=50)	Obese female (n=50)
Age (years) (20.00-40.00)	31.18±4.71	31.24±4.71 (20.00-40.00)
BMI (kg/m^2) (18.73-24.99)	23.04±1.40	30.63±3.67*** (25.15-39.54)
WHR (0.77-0.87)	0.83±0.02	0.88±0.06 *** (0.75-0.98)
SBP (mmHg) (100.00-120.00)	110.50±7.30	110.90±7.26 (100.00-120.00)
DBP (mmHg) (60.00-80.00)	69.68±7.49	67.50±7.30 (60.00-80.00)

Data are expressed as mean±SD. Unpaired Student's 't'test analyzed statistical significance.BMI= Body mass index, WHR= Waist hip ratio, SBP= Systolic blood pressure, DBP= Diastolic blood pressure. ***p<0.001

Table II: Study parameters of the subjects in both groups (n=100)

Group A	Group B	p value	(A vs B)
	Adult nonobese	Adult obese	
Parameters	female (n=50)	female (n=50)	
Serum gamma-glutamyl transferase (U/L)	20.65±5.14 (10.10-32.00)	38.82±19.21 (12.90-102.30)	<0.001***
Fasting serum glucose (mmol/L)	4.80±0.68 (3.70-6.90)	4.86±0.64 (3.70-6.00)	0.619ns
Fasting serum insulin (IU/ml)	8.48±4.60 (3.50 -23.90)	25.58±6.61 (15.70-38.20)	<0.001***
HOMA-IR	1.09±0.59 (0.44-2.93)	3.17±0.76 (2.09-4.78)	<0.001***

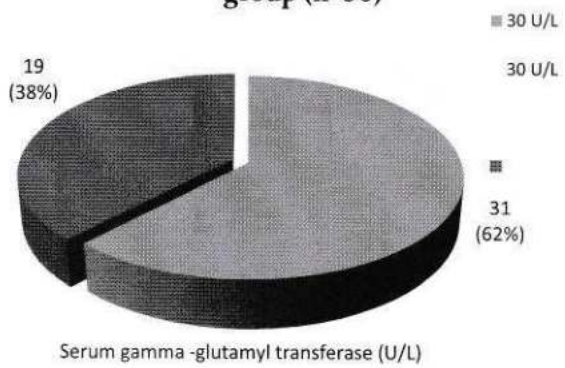
Results are expressed as mean±SD. Figures in parentheses indicate range. . Unpaired Student's 't' test was performed to compare between groups. The test of significance was calculated and p value <0.05 was accepted as level of significance.

n = Number of subjects *** = Significant

ns = Not significant

Figure I

Distribution of the subject by serum gamma glutamyl transferase (GGT) level in study group (n=50)



n= Number of subjects

Figure II

Distribution of the subject by HOMA- IR in study group (n=50)

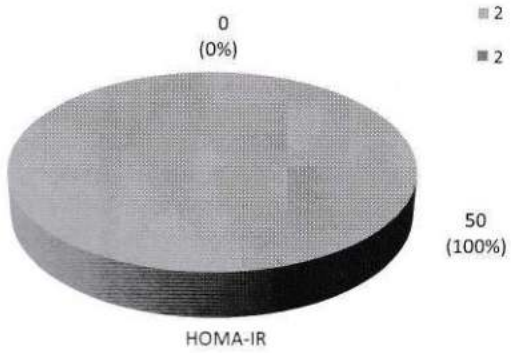


Figure III

Correlation between BMI and serum GGT level in study group (n=50)

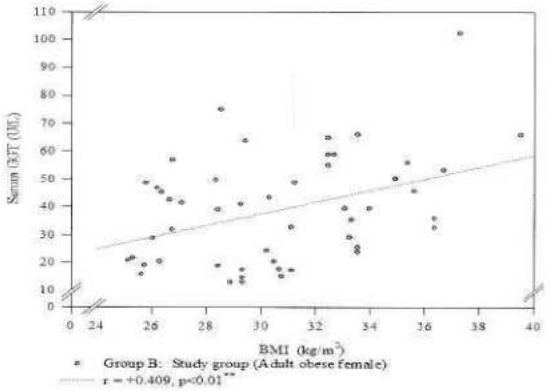


Figure IV

Correlation between BMI and HOMA-IR in study group (n=50)

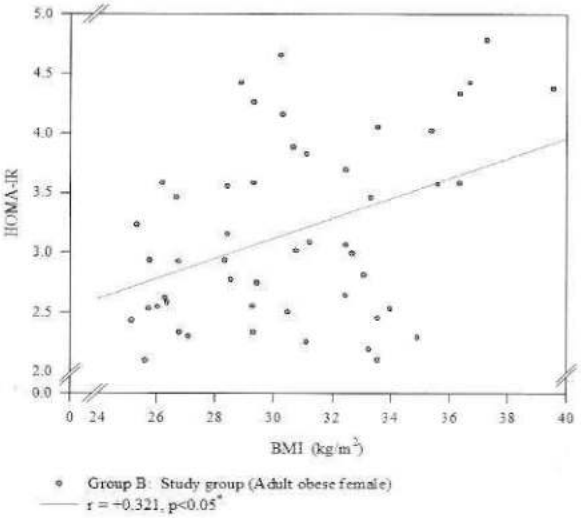


Figure V

Correlation between waist-hip ratio and serum GGT level in study group (n=50)

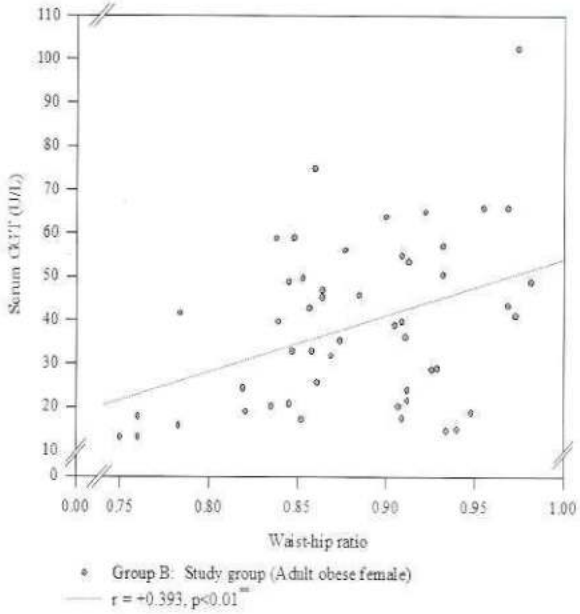


Figure VI

Correlation between waist-hip ratio and HOMA-IR in study group (n=50)

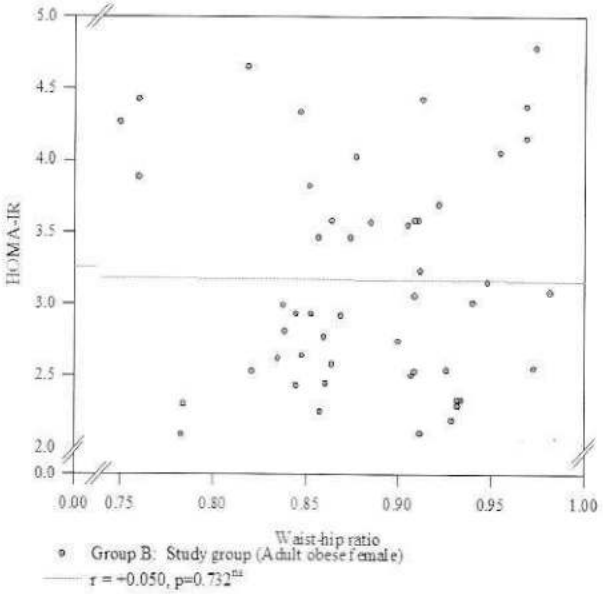
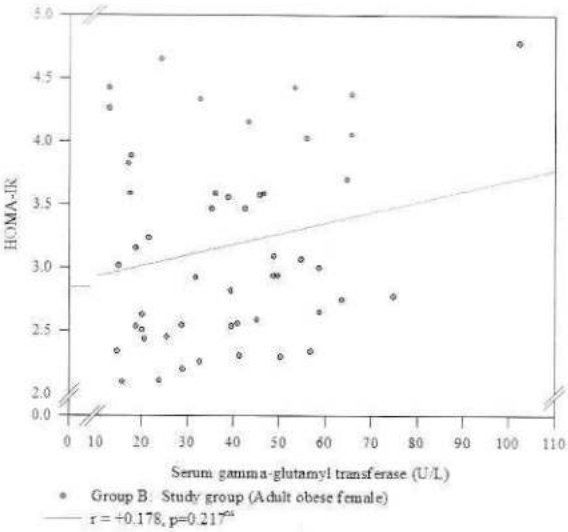


Figure VII

Correlation between serum gamma-glutamyl transferase (GGT) level and HOMA-IR in study group (n=50



Discussion

In the present study,serum GGT level and HOMA-IR were significantly higher in obese female than non obese female. In addition, correlation analysis showed positive relationship between serum GGT level and HOMA-IR in obese female subjects. These results are similar to other authors. But some investigators did not find significant difference of serum GGT level and HOMA-IR in obese.

Literature review suggested that in obese subjects, excessive fat accumulation occur in liver. There is increased release of free fatty acids (FFAs) from visceral adipose tissue directly into the portal circulation and accumulated as triglyceride in hepatocytes causing hepatic steatosis. This triglyceride accumulation may also occur due to denovolipogenesis. Thus, hepatic cell damage occur in obese that reflected in their raised serum GGT levels 19-21.

In obese subjects, excess fat in liver enhances oxidative stress by stimulating lipid peroxidation and production of reactive oxygen species (ROS). This oxidative stress in obese leads to overconsumption of glutathione (GSH) thereby compensatory increase in serum GGT level. Thus, elevated serum GGT could be a marker of oxidative stress. This oxidative stress induces insulin resistance by impairing the insulin receptor substrate (IRS -1) phosphorylation and activation of phosphatidylinositol 3-Kinase (PI3K)22--25.

In the present study, increased serum GGT level and insulin resistance (by HOMA-IR) were observed in adult obese female. These may be due to hepatic steatosis leading to hepatic cell damage in obese subjects. This hepatic steatosis induces insulin resistance by inhibiting the insulin signaling pathways. Again, hepatic steatosis enhances oxidative stress by stimulating lipid peroxidation and production of reactive oxygen species (ROS). This oxidative stress leads to overconsumption of glutathione, inflammation, endoplasmic reticulum (ER) stress and ultimately decreased insulin activity followed by insulin resistance. But the exact mechanism is not elucidated in this study as the plasma free fatty acid level and plasma antioxidant status were not assessed due to time and financial constrains.

Conclusion

After analyzing the results of the study, it is concluded that higher serum GGT level was observed and directly related with insulin resistance in adult obese female subjects. Therefore, estimation of these parameters in obese subjects might be useful to provide further information for prediction of future risk of developing diabetes mellitus and thus reduce the complications related to obesity.

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ORIGINAL ARTICLE

The Osmani Medical Teachers Association Journal Volume 17 Number 2

Efficacy of Dapagliflozin versus Sitagliptin in uncontrolled type 2 diabetes mellitus treated with combination of Metformin and Gliclazide

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Abstract

Type 2 diabetes mellitus is a significant burden in Bangladesh, approximately 5.1 million patients have been diagnosed with diabetes. The progressive nature of Type 2 DM usually requires combination of differently acting antidiabetic drugs to maintain glycemic control when monotherapy is inadequate. Combination therapy in daily practice are not always the most advantageous. Basal insulin is often the next therapeutic step. But due to unwillingness to use of insulin necessitating add-on another oral antidiabetic agents. Now new options of dapagliflozin or sitagliptin is used in clinical practice as add-on therapy in uncontrolled T2DM being treated with combination of metformin and gliclazide.This study was undertakento compare the effectiveness ofdapagliflozin versus sitagliptin in uncontrolled type 2 diabetic patient being treated with metformin and gliclazide. In this study include 67 uncontrolled diabetic patients those who previously receiving maximum tolerable dose of metformin (1500- 2,550 mg/day) and gliclazide (120-320 mg/day) for at least 3 months. Study sample were selected and were divided randomly by lottery method into group-A and group-B. Patients of group A were treated with sitagliptin 50 mg daily and patients of group B were treated with dapagliflozin 5 mg daily as add on for 3 months.Each patient was followed up at 2nd, 4th, 8th and 12th week of treatment. At each follow up fasting plasma glucose and 2hours postprandial plasma glucose were assessed, HbA1c was estimated at baseline and at 12th week. FPG level (p< 0.001), postprandial PG level(p< 0.001) and HbA1c level (p< 0.001) were decreased significantly from baseline to end point of treatment in both groups. ThusDapagliflozin and Sitagliptin are effective individually as add- on to metformin and gliclazide in uncontrolled T2DM patients.

[OMTAJ 2018; 17 (2)]

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Introduction

Diabetes mellitus is a clinical syndrome characterized by an increase in plasma blood glucose (hyperglycemia) 1.Diabetes mellitus has become a significant health care problem throughout the world. Type 2 DM is more common in the developed countries. Globally, an estimated 422 million adults are living with diabetes mellitus, according to the latest 2016 data from the World Health Organization2. WHO projects that diabetes will be the 7th leading cause of death in 20303. The prevalence of type 2 diabetes is increasing rapidly in Bangladesh is 7.4%4. Treatment of type 2 diabetes often begins with lifestyle management and/or metformin5. Treatment with a single anti hyperglycemic agent is often unsuccessful at achieving or maintaining long-term glycemic control in patients with type 2 diabetes, so many patients require combination therapies6. After taking maximum recommended tolerable dose of metformin and HbA1c target <7% not achieved after approximately 3 months of monotherapy, recommended to be proceed to 2-drug combination. Many options are available for Dual Therapy, including sulfonylurea, thiazolidinedione, dipeptidyl peptidase 4(DPP-4) inhibitor, sodium-glucose co-transporter 2 (SGLT2) inhibitor, glucagon-like peptide 1(GLP-1) receptor agonist, or insulin7 .Gliclazides a sulfonylurea are commonly used as add-on therapy for patients inadequately controlled with metformin8.

After taking maximum recommended dose of metformin and gliclazide, HbA1c target not achieved in 3 months then uncontrolled type 2 diabetic patients can be treated with Triple therapy or Insulin. Due to some obstacles to insulin therapy such as cost, patients have needle anxiety, feeling of personal failure, social embarrassment, fear of hypoglycemia, perceived complexity of insulin regimen we prefer OHA9.

Sitagliptin is potent and highly selective DPP-4 inhibitor,has been reported to improve glycemic control under fasting and postprandial conditions, as well as improving beta cell function. It has low risk of hypoglycemia.Dapagliflozin is highly selective SGLT2 inhibitor, is given in once -daily doses10,11. This is the newest class of U.S Food and Drug Administration-and European Medicines Agency, approved (April 2012) diabetes drugs that reduce plasma glucose concentrations by inhibiting renal glucose reabsorption12. So the aim of the study is to compare the efficacy of dapagliflozin versus sitagliptin in uncontrolled type 2 diabetic patient treated with metformin and gliclazide as add-on therapy during a 12 week period.

Materials and Methods:

A prospective longitudinal study was carried out in the Department of Pharmacology and Therapeutics, in collaboration with Department of Endocrinology, Sylhet MAG Osmani Medical College Hospital, Sylhet and Sylhet Diabetic Hospital during the period from January 2017 to December 2017. For this purpose a random sample of 73 uncontrolled diabetic patients, previously receiving maximum tolerable dose of metformin (1500-2,550 mg/day) and gliclazide (120-320 mg/day) for at least 3 months were fulfilling the inclusion criteria. They were divided randomly by lottery method into two groups, containing 40 patients in group A and 33 patients in group B. The patients of group A were treated with sitagliptin 50 mg orally once daily taken in the morning either with or without food as add-on treatment. The patients of group B were treated with dapagliflozin 5 mg once daily taken in the morning either with or without food as add- on treatment. In course of follow up period 3 patients from group-A (failed to complete follow up) and 3 patients from group-B (glycemic control was not achieved in one patients on 2nd week and failed to complete follow up two patients) were dropped out. So, 37 patients in group-A and 30 patients in group-B were completed 12 weeks of treatment period.

Result:

Total 73 patients were enrolled in this study. After randomization 3 patients from group-A and 3 patients from group-B who failed to complete follow up visit were excluded. So 37 patients of group A (Metformin, Gliclazide, plus Sitagliptin treated group) and 30 patients of group-B (Metformin, Gliclazide, plus Dapagliflozin treated group) were analyzed in this study.

Table-I and figure-1 showed the effect of Sitagliptin and Dapagliflozin on fasting plasma glucose (FPG) level administered as add-on treatment in diabetic patients receiving 1500-2550 mg/day metformin and 120-320 mg/day gliclazide estimated before and the 2nd, 4th, 8th and 12th week of treatment. In the Sitagliptin treated group, the mean fasting plasma glucose level was 158.9 ± 22.8 mg/dl before the initiation of treatment which decreased gradually to 125.2 ± 18.4 mg/dl at 2nd week, to 109.1 ± 13.8 mg/dl at the 4th week, to 99.1 ± 17.3 at 8th week and to 96.3 ± 15.3 mg/dl at the 12th week. The overall difference from the baseline to the end point of treatment was significant (F=118.640; df=4; p<0.001). In the Dapagliflozin treated group, the mean fasting plasma glucose level was 193.2 ± 47.5 mg/dl before the initiation of treatment which decreased to 122.0 ± 22.2 mg/dl at 2nd week, to 100.9 ± 17.7 mg/dl at 4th week, to 92.8 ± 14.4 mg/dl at 8th week and to 86.9 ± 10.9 mg/dl at 12th week. The overall difference from baseline to end point of treatment was significant (F=104.375; df=4; p<0.001). When the changes in fasting plasma glucose level were compared between two treatment groups, a significant difference was observed before initiation of treatment (t= - 3.875; p<0.001), at 4th week (t=2.141; p=0.036) and at 12th week (t=2.829; p=0.006) of Sitagliptin and Dapagliflozin treatment but no significant difference was observed at 2nd week (t=0.602; p=0.549) and 8th week (t=1.591; p=0.117) of Sitagliptin and Dapagliflozin treatment.

Table-I Effect of Sitagliptin and Dapagliflozin on fasting plasma Glucose (FPG) level administered as add-on treatment in diabetic patients estimated at baseline, 2nd, 4th, 8th and 12th week of treatment

Study group	FPG (Mean± SD) mg/dL					†p value
	Baseline '0' week	At 2nd week	At 4th week	At 8th week	At 12th week	
Sitagliptin group (n=37)	158.9 ± 22.8	125.2 ± 18.4	109.1 ± 13.8	99.1 ± 17.3	96.3 ± 15.3	p<0.001
Dapagliflozin group (n=30)	193.2 ± 47.5	122.0 ± 22.2	100.9 ± 17.7	92.8 ± 14.4	86.9 ± 10.9	p<0.001
*p value	p<0.001	p=0.549	p=0.036	p=0.117	p=0.006	

Unpaired t test and repeated measure ANOVA was applied to analyze data.

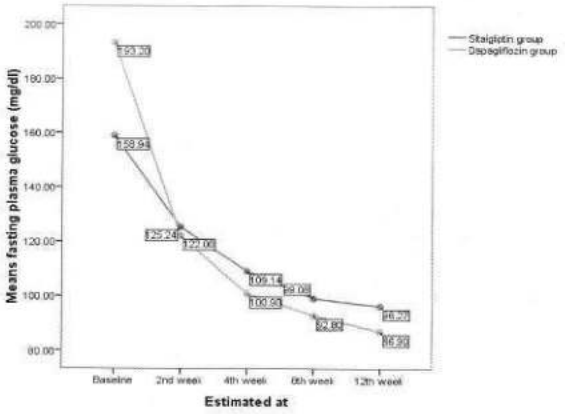

Figure-1: Effect of Sitagliptin and Dapagliflozin on fasting plasma Glucose (FPG) level administered as add-on treatment in diabetic patients estimated at baseline, 2nd, 4th, 8th and 12th week of treatment

Table-II and figure-2 showed, effect of Sitagliptin and Dapagliflozin on postprandial plasma glucose level administered as add-on treatment in diabetic patients receiving 1500-2550 mg/day metformin and 120-320 mg/day gliclazide estimated before and the 2nd, 4th, 8th and 12th week of treatment. In the Sitagliptin treated group, the mean postprandial plasma glucose level was 255.5 ± 46.5 mg/dl before the initiation of treatment which decreased gradually to 178.8 ± 26.7 mg/dl at 2nd week, to 162.7 ± 24.5 mg/dl at 4th week, to 159.8 ± 20.9 at 8th week and to 157.22 ± 22.4 mg/dl at the 12th week. The overall difference from the baseline to the end point of treatment was significant (F=94.811; df=4; p<0.001). In the Dapagliflozin treated group, the mean postprandial plasma glucose level was 293. 7 ± 55.4 mg/dl before the initiation of treatment which decreased to 189.83 ± 26.2 mg/dl at 2nd week, to 172.5 ± 19.1 mg/dl at 4th week, to 161.03 ± 16.9 mg/dl at 8th week and to 154.0 ± 18.1 mg/dl at 12th week. The overall difference from baseline to end point of treatment was significant (F=131.780; df=4; p<0.001). When the changes in postprandial plasma glucose level were compared between two treatment groups, a significant difference was observed before initiation of treatment (t= - 3.064; p=0.003); but there were no significant difference of postprandial plasma glucose level between Sitagliptin group and Dapagliflozin group estimated at 2nd week (t= - 0.1.698; p=0.094), 4th week (t=- 1.784; p=0.079), 8th week (t=- 0.253; p=0.801) and at 12th week (t=0.629; p=0.531) of treatment.

Table-II Effect of Sitagliptin and Dapagliflozin on post prandial plasma glucose level administered as add-on treatment in diabetic patients estimated at baseline, 2nd 4th, 8th and 12th week of treatment

Study group	Postprandial PG (Mean± SD) mg/dL					†p value
	Baseline '0' week	At 2nd week	At 4th week	At 8th week	At 12th week	
Sitagliptin group (n=37)	255.5 ± 46.5	178.8 ± 26.7	162.7 ± 24.5	159.8 ± 20.9	157.22 ± 22.4	p<0.001
Dapagliflozin group (n=30)	293. 7 ± 55.4	189.83 ± 26.2	172.5 ± 19.1	161.03 ± 16.9	154.0 ± 18.1	p<0.001
*p value	p=0.003	p=0.094	p=0.079	p=0.801	p=0.531	

*Unpaired t test and †repeated measure ANOVA . Data were presented as mean ± SD.

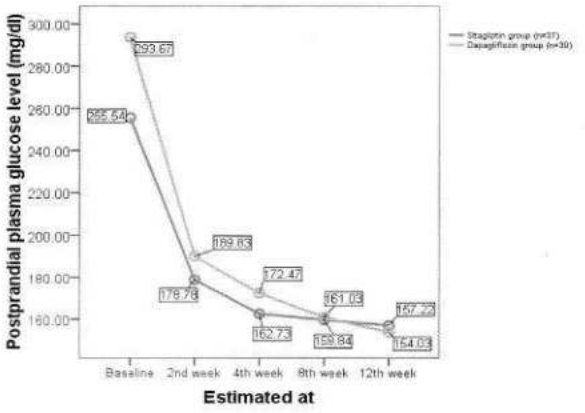

Figure-2: Effect of Sitagliptin and Dapagliflozin on post prandial plasma glucose level administered as add-on treatment in diabetic patients estimated at baseline, 2nd, 4th, 8th and 12th week of treatment

Table-lll showed, the effect of Sitagliptin or Dapagliflozin on HbA1c level administered as add-on treatment in diabetic patients receiving1500- 2550 mg/day metformin and 120-320 mg/day gliclazide estimated before and 12th week of treatment. In Sitagliptin treated group, the mean HbA1c level before initiation of treatment was recorded as 8.73 ± 0.91 percent and at 12th week of treatment was recorded as 6.68 ± 0.60 percent. The difference was statistically significant (t=17.022; p<0.001); while in Dapagliflozin treated group, the mean HbA1c level before initiation of treatment was estimated as 9.05 ± 0.80 percent and at 12h week of treatment was estimated as 6.64 ± 0.41 percent. The difference was statistically significant (t=21.646; p<0.001).

The mean HbA1c level before initiation of treatment was almost similar in both groups (t=-1.547; p=0.127); and at 12th week of treatment HbA1c level was almost same, no significant difference between Sitagliptin group compared to Dapagliflozin group (t=0.297; p=0.768).

Table-lll: Effect of Sitagliptin and Dapagliflozin on HbA1c level administered as add-on treatment in diabetic patients estimated before and after 12th weeks of treatment.

Time interval	Sitagliptin treated group (n=37) HbA1c (Mean ± SD)	Dapagliflozin group (n=30) HbA1c (Mean ± SD)	*p value
Before treatment	8.73 ± 0.91	9.05 ± 0.80	p=0.127
12th week after treatment	6.68 ± 0.60	6.64 ± 0.41	p=0.768
†p value	p<0.001	p<0.001	

†Paired 't' test and *unpaired t test .

Table-IV showed the effect of Sitagliptin or Dapagliflozin administered as add-on treatment in diabetic patients receiving 1500- 2550 mg metformin and 120-320 mg gliclazide on reduction of HbA1c of target level estimated 12th week of treatment. At 12th week of treatment HbA1c level <7% was in 23 (62.2%) patients in Sitagliptin treated group and 22 (73.3%) patients in Dapagliflozin treated group. There is no significant difference of HbA1c target level (<7.0%) between the study groups (Sitagliptin group and Dapagliflozin group) (?2=0.937; p=0.333).

Table-IV: Effect of Sitagliptin and Dapagliflozin administered as add-on treatment in diabetic patients on reduction of HbA1c of target level estimated after 12th weeks of treatment.

At 12 weeks HbA1c level	Sitagliptin treated group (n=37)	Dapagliflozin treated group (n=30)	*p value
<7.0%	23 (62.2%)	22 (73.3%)	p=0.333
>7.0%	14 (37.8%)	8 (26.7%)	

*Chi-Square (X2) test was done.

Table- Vand figure-5 showed, the percentage change in fasting plasma glucose (FPG) level estimated at 2nd, 4th, 8th, 12th week of treatment compare to before initiation of treatment. In Sitagliptin treated group, the percentage reduction of FPG from baseline was-21.04% at 2nd week, -30.48 at 4th week, -37.01% at 8th week and -38.41% at 12th week of treatment. The overall difference from baseline to end point of treatment was significant (F=44.009; df=3; p<0.001). In Dapagliflozin treated group, the percentage reduction of FPG from baseline was - 34.01% at 2nd week, - 45.75 at 4th week, - 49.44% at 8th week and - 52.49% at 12th week of treatment. The overall difference from baseline to end point of treatment was significant (F=51.776; df=3; p<0.001). But when percentage reduction of fasting plasma glucose level were compared, between two treatment group, there were significant higher percentage reduction of fasting plasma glucose level in Dapagliflozin treated group compared to Sitagliptin treated group estimated at 2nd week (t=4.157; p<0.001), at 4th week (t=5.425; p<0.001), at 8th week (t=3.970; p<0.001) and at 12th week (t=4.679; p<0.001) of treatment.

Table-V: Percentage change in fasting plasma glucose (FPG) level estimated at 2nd, 4th, 8th and 12th week of treatment compare to before initiation of treatment

Group	Percentage change fasting plasma glucose				†p-value
	At 2nd week	At 4th week	At 8th week	At 12th week	
Sitagliptin group (n=37)	-21.04	-30.48	-37.01	-38.41	p<0.001
Dapagliflozin group (n=30)	-34.01	-45.75	-49.44	-52.49	p<0.001
*p- value	p<0.001	p<0.001	p<0.001	p<0.001	

Data were presented as mean value. †Repeated measure ANOVA and *unpaired t test

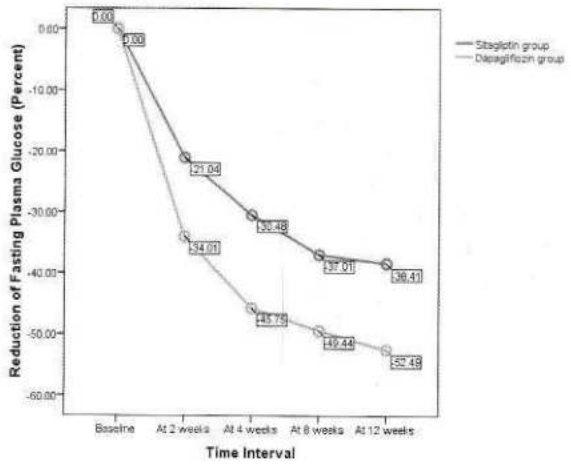

Figure-5: Percentage change in fasting plasma glucose (FPG) level estimated at 2nd, 4th, 8th and 12th week of treatment compare to baseline

Table-VI and figure-6 showed, the percentage change in 2 hours post prandial plasma glucose level estimated at 2nd, 4th, 8th, 12th week of treatment compare to before initiation of treatment. In Sitagliptin treated group, the percentage reduction of 2 hour postprandial PG was -28.59% at 2nd week, -34.07% at 4th week, -35.80% at 8th week and -37.02% at 12th week of treatment. The overall difference from baseline to end point of treatment was significant (F=13.112; df=3; p<0.001). In Dapagliflozin treated group, the percentage reduction of 2 hour postprandial PG was -33.47% at 2nd week, -39.80% at 4th week, -43.54% at 8th week and -46.06% at 12th week of treatment. The overall difference from baseline to end point of treatment was significant (F=34.006; df=3; p<0.001). But when percentage reduction of 2 hour postprandial PG were compared, between two treatment groups, there were no significant percentage reduction of 2 hour postprandial PG level in Sitagliptin treated group compared to Dapagliflozin treated group estimated at 2nd week (t=1.550; p=0.126) and at 4th week (t=1.745; p=0.086) but significantly more percentage reduction in Dapagliflozin in treated group compared to Sitagliptin treated group at 8th week (t=2.694; p=0.009), at 12th week (t=3.252; p=0.002).

Table-VI: Percentage change in 2 hours postprandial plasma glucose level estimated at 2nd, 4th, 8th and 12th week of treatment compare to before initiation of treatment

Group	Percentage change postprandial plasma glucose				†p-value
	At 2nd week	At 4th week	At 8th week	At 12th week	
Sitagliptin group (n=37)	-28.59	-34.07	-35.80	-37.02	p<0.001
Dapagliflozin group (n=30)	-33.47	-39.80	-43.54	-46.06	p<0.001
*p- value	p=0.126	p=0.086	p=0.009	p=0.002	

Data were presented as mean value. Repeated measure ANOVA and *unpaired t test

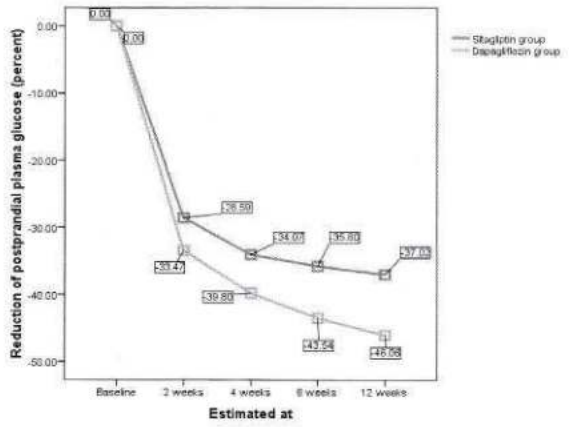

Figure-6: Percentage change in 2 hours postprandial plasma glucose level estimated at 2nd, 4th, 8th and 12th week of treatment compare to baseline

Discussion: Type 2 diabetes mell itus is a growing worldwide epidemic13. It accounts for 90-95% of the total cases of diabetes14.

In the present study, the mean estimated fasting plasma glucose level in sitagliptin treated group initially 58±22.8 mg/dl and at the end of 12th week 96.3±15.3 mg/dl. Mean FPG level significantly reduced at the end of 12th week in sitagliptin treated group. In dapagliflozin treated group initialy mean FPG 193.2±47.5 mg/dl and at 12th week of treatment 86.9±10.9 mg/dl, that was also significant (p <0.001). Reduction of mean FPG level was more marked in dapagliflozin treated group than that of sitagliptin treated group. The percentage reduction of fasting plasma glucose was also more marked in dapagliflozin treated group -52.49 than that of sitagliptin treated group -38.41 at the end of 12th week.

Hayashi et al. found that the mean fasting plasma glucose level significantly decreased (p=0.043) from the baseline in sitagliptin treated group 144.9±57.9 mg/dl to 126.2±43.9 mg/dl at the end of 12th week. In dapagliflozin treated group baseline was 145.8±47.8 mg/dl and at the 12th week 122.3±24.9 mg/dl which was also significant (p=0.002) but reduction was more marked in dapagliflozin treated group than that of sitagliptin treated group. The percentage reduction of fasting plasma glucose was also more marked in dapagliflozin treated group -16.1 than that of sitagliptin treated group -12.1 at the end of 12th week15. This result was correspond with our study. Significant reduction in fasting plasma glucose level with dapagliflozin treated patients also observed in several other studies (Bailey et al. Orme et al. and Filippatos et al.)16,17,18. Significant reduction in fasting plasma glucose level with sitagliptin treated patients was observed in several other studies (Ballav and Gough, Moses et al. and Jianming et al.)19,20,21 also consistent with this study.

In this study, the mean 2 hour postprandial plasma glucose level was decreased significantly (p<0.001) from baseline 255±46.5 mg/dl to end of 12th week of treatment 157.22± 22.4 mg/dl in sitagliptin treated group and in dapagliflozin treated group significantly reduced (p<0.001) from baseline 293.7±55.4 mg/dl to 154.0±18.1 mg/dl at the end of 12th week. Between two treatment groups, postprandial plasma glucose level were compared, a significant difference were observed before initiation of treatment (p=0.003) but there were no significant difference (p=0.531) observed at the end of 12thweek. The percentage reduction of 2 hour postprandial plasma glucose level was also more marked in dapagliflozin treated group -46.06 than that of sitagliptin treated group -37.02 at the end of 12th week.

Jianming et al. found that significant reduction in 2 hour post prandial plasma glucose level with sitagliptin was -32.9 mg/dl (p< 0.001)21.Matthaei.,Catrinoiu., Celinski et al., (2015) found that participants in the dapagliflozin group had greater reduction -37 mg/dl in 2 hours post prandial plasma glucose22. This result was correlated with our study.

In this study also observed that, in sitagliptin treated group, the mean HbA1c level before initiation of treatment was 8.73±0.91 percent and at 12th week of treatment was 6.68 ± 0.60 percent i.e; significantly reduced (p<0.001) mean HbA1c level. In dapagliflozin treated group, the mean HbA1c level before initiation of treatment was 9.05±0.80 percent and at 12th week of treatment was 6.64±0.41 percent i.e; significantly reduced (p<0.001) mean HbA1c level. But between 2 groups the change of mean HbA1c level were non-significant (p=0.768) at the end of 12th week of treatment.

This result was similar to the study of Hayashi et al. that, in sitagliptin treated group, the mean HbA1c level before initiation of treatment was 7.55±1.64 percent and at 12th week of treatment was 6.92±1.20 percent i.e; significantly reduced (p=0.006) mean HbA1c level. In dapagliflozin treated group, the mean HbA1c level before initiation of treatment was 7.61±1.15 percent and at 12th week of treatment was 6.86±0.81 percent i.e; significantly reduced (p<0.001) mean HbA1c level. But between 2 groups the change of mean HbA1c level were non-significant (p=0.378) at 12th week of treatment15.Significant reduction of HbA1c in patients treated with dapagliflozin was found in the study of Bailey et al.Orme et al. and Fillippatos et al.16,17,18. This result was consistent with this study.

In the present study, at the end of 12th week treatment HbA1c level in dapagliflozin treated group majority of the patients (73.3%) achieved therapeutic glycemic target (<7%). In sitagliptin treated group (62.2%) patients achieved therapeutic glycemic target (<7%). But there were no significant difference (p= 0.333) between two groups.

We observe Dapagliflozin and Sitagliptin are effective individually as add- on to metformin and gliclazide in uncontrolled T2DM patients.

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ORIGINAL ARTICLE

The Osmani Medical Teachers Association Journal Volume 17 Number 2

Stress Influences Psoriasis: A Cross-sectional Study on a Tertiary Hospital in Bangladesh

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Abstract

Introduction: Psoriasis is a common, chronic and recurrent inflammatory disease of the skin. Several factors contribute to the development of this disease such as: genetic factors, trauma, infection, certain medicines, endocrine factors, sunlight, metabolic factors, alcohol, cigarette and psychological factors.

[OMTAJ 2018; 17 (2)]

Introduction

Psoriasis is a chronic inflammatory disease characterized by T-cell mediated hyperproliferation of keratenocytes (1). The disease is usually manifested as raised, well-demarcated, erythematous oval plaques with adherent silvery scales (2). The etiology of psoriasis is not fully understood, but it appears to be multifactorial, involving both genetic and environmental influences (3). One of the most common triggers for many inflammatory skin disorders is emotional stress. Understanding the significance of emotional triggers to common inflammatory dermatologic disorders is critical for optimal management of these conditions (4). Emotional stress may influence the development and exacerbation of psoriasis. The proportion of psoriasis patients who believe stress affects their skin condition is considerably high, ranging from 37% to 78% (4).

Psoriasis is a chronic, relapsing condition with a 1%-2% prevalence in the general population (5). Stress appears to be an important precipitating factor in the development and exacerbation of psoriasis (3). About 40% of psoriatic report that psychosocial stress significantly exacerbates their condition. Stress has been defined in many ways. To the physicist, the term refers to a force, strain or pressure applied to a system. However, when the stress response is excessive or in appropriate, it disrupts physiological homeostasis and body function and contributes to disease production (6). Exposure to stress in psoriatic patients has been associated with diminished HPA responses and up regulated sympathic adernomedullary (SAM) responses (7). Evers et al., found psoriasis patients had significantly lower cortisol levels at moments when daily stressors are at peak levels. Decreased secretion of cortisol and increased levels of epinephrine (8) and norepinephrine may stimulate the release of mast cells, affect skin barrier function, and upregulate proinflammatory cytokines, which could thereby maintain or exacerbate psoriasis severity (9).

There have been no formal studies of the perceived influence of stress on psoriasis onset and disease activity in our country. By imposing methodological control and a numerate approach, stress factor influencing the psoriasis can offer a major contribution to understand psoriasis.

Psoriasis is one of the major public health problem. Psoriasis is found in all ages, classes of the society and creates a major psychological as well as cosmetic problem and a vast reduction of quality of life in developing countries as well as developed countries. Though the exact statistics of incidence and prevalence of psoriasis patient in our country is not available but it is common opinion that the number of sufferers from psoriasis is highly alarming. The etiology of psoriasis is not fully understood, but it appears to be multifactorial, involving both genetic and environmental influences. Among these factors stress is considered to play an important role in the onset and exacerbation of psoriasis. The aim of present study was to identify stress factor influencing the onset of psoriasis.

Materials and methods

It was a cross-sectional observational study done on July 2015 to June 2016 in the Department of Skin and Venereal Disease, Dhaka Medical College and Hospital. About 113 psoriatic patients were selected as particepants. Purposive sampling technique was used for sample collection. Prior to the commencement of this study, the research protocol was approved by the Ethical Committee of DMCH. The aims and objectives of the study were explained to the patients in easily understandable local language and then informed consent was taken from each patient.

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Results:

The main objective of the study was to determine the influence of stress factor in psoriasis. The data obtained from 113 psoriatic patients were as follows:

In the present study mean age of the participants was 36.07±16.31 years(range was 11 - 75) Distribution of psoriatic patients by age was show in Table 1. Maximum patients were in the age group of 21-30 years (26.5%).

Out of 113 patients, male were 64(56.6%) and females were 49(43.4%) was shown in

Table 2.

Table-3 shows the stress event affecting life within 2 months prior to disease. Divorce was presented in 8.1% cases, 51.3% cases had severe life threatening diseases affecting the patient or close family members, 45.1% patients had history of deaths within the close family members, 39.8% patients had serious financial difficulties and 4.4% patients had harassment at school, 65.5 patients experienced first outbreak of psoriasis during a period of stress. 41.6% psoriatic patients became worse during times of stress. 38.9% patients had a tendency to break out during times of stress.

Regarding co-morbidity, hypertension was presented in 14.2% cases; diabetes 2.7% and 83.2% patients had no history of associated disease (table 4).

Table 1 Age distribution of the psoriatic patients (n=113)

Age in years	Frequency	Percentage (%)
10-20	23	20.4
21-30	30	26.5
31-40	21	18.6
41-50	18	15.9
51-60	11	9.7
>60	10	8.8
Total	113	100.0
Mean±SD Range	36.07±16.31 (11-75) years	

Table 2 Sex distribution of the psoriatic patients (n=113)

Sex	Frequency	Percentage (%)
Male	64	56.6
Female	49	43.4
Total	113	100.0
Male: female ratio	1.3:1	

Table 3 Distribution of the psoriatic patients by stress evaluation (n=113)

Stress evaluation	Frequency	Percentage (%)
Stress event affecting life within 2 months prior to disease	79	69.9
Divorce	8	8.1
Severe life threatening diseases affecting the patient or close family members	58	51.3
Deaths within the close family member	51	45.1
Serious financial difficulties	45	39.8
Harassment at school	5	4.4
Did you experience your first outbreak of psoriasis during a period of stress?	74	65.5
Does your psoriasis become worse during times of stress?	47	41.6
Does your psoriasis have a tendency to break out during times of stress?	44	38.9

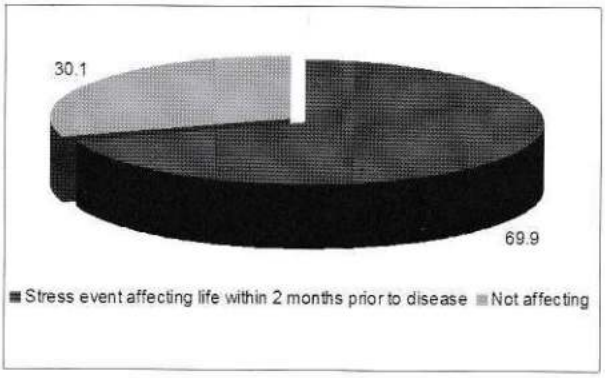

Fig. 1: Pie diagram showing the stress event affecting life within 2 months prior to

disease.

Table 4: Distribution of the psoriatic patients by co-morbidity (n=113)

Co-morbidity	Frequency	Percentage (%)
Hypertension	16	14.2
Diabetes	3	2.7
No associated disease	94	83.2
Total	113	100.0

Discussions:

This was a descriptive, cross-sectional type of observational study conducted in Dhaka Medical College Hospital. 113 psoriatic patients in indoor and outdoor of Dermatology department were included in this study.

In our study the most represented age group was 10-30 years (46.9%). Out of 113 psoriatic patients 56.6% were male and 43.4% were female.

In the present study we investigated certain psychological aspects in psoriatic patients. Our study underlined the role of the stress factors in the onset or recurrence of the disease. Divorce was presented in 8.1% cases, 51.3% cases had severe life threatening diseases affecting the patient or close family members, 45.1% patients had history of deaths within the close family members, 39.8% patients had serious financial difficulties and 4.4% patients had harassment at school. 41.6% psoriatic patients became worse duration times of stress. 38.9% patients had a tendency to break out during times of stress. Many authors have confirmed similar data . The most common factors for the onset of disease are the environment in which a person has been living and working for a longer period of time, and the attitude of a person toward such an environment. The stage of chronic stress may be recognized by psychodynamic approach analyzing the past and present. Chronic stresses, step by step, affect the organism and finally lead to the manifestation of disease (10).

Psoriasis is associated with experiencing emotional reactions of varying intensity by the patient. With this illness the patient is not vitally endangered but is, because of the importance of the skin, put into the situation of not being able to enjoy many pleasures of the daily life. Therefore psoriatic patients mostly suffer from depression, anxiety, neurosis and alcoholism (10, 11). Without professional treatment and assistance the patient can hardly escape from this closed magic circle. Our study, which was carried out on the basis of an accurate history and a questionnaire, indicate that stress is one of the most important factors in the onset of psoriasis.

In present study, 39.8% patients had serious financial difficulties. Many studies reveal that the choice of employment or career, and therefore income, is affected by psoriasis (12; 13,14). In one study, 40% of patients reported experiencing major difficulties at work (15) and in another, 2% stopped work due to psoriasis (12). There is an inverse relationship between psoriasis severity, employment and income (14; 16; 17, 18) In a study of 601 patients by Horn et al. 31.2% of patients with severe psoriasis had a low income compared with 18.1% of patients with mild psoriasis(14).

The overall prevalence of stress event affecting life within 2 months prior to disease among psoriatic patients in our study was 69.9%. The prevalence of severe life threatening diseases affecting the patient or close family members was 51.3%. This is in partial agreement with findings of other studies reviewed here (19 & 20).

Conclusion

Results of this study demonstrated that the stress factor is of paramount importance for the development and aggravation of psoriasis. Stress is commonly accepted as an exacerbating factor in psoriasis. Many clinical studies continue to document its role in the onset and exacerbation of psoriasis. One problem is that most investigations on stress are generally, retrospective, primary based on patient recall of past events, which may or may not be an entirely reliable measure. However, stress appears to be an important precipitating factor in the development and exacerbation of psoriasis. So, management of psoriasis may be optimized by non-pharmacological or pharmacological-psychological intervention.

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ORIGINAL ARTICLE

The Osmani Medical Teachers Association Journal Volume 17 Number 2

Estimation Of Platelet Count In Type 2 Diabetes Male Subjects

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Abstract

Diabetes mellitus (DM) and its complication is increasing in our country and all over the world. Altered platelet morphology and functionhave been suggested as a newly emerging and independent risk marker for atherothrombosis and cardiovascular disease (CVD).

The present study was carried out to assess the platelet count level in subjects with type 2 diabetes mellitus.It was a cross sectional analytic study and conducted in the Department of Physiology, Dhaka Medical College, Dhaka from July 2013 to June 2014. The total number of subject ware 200 male, among them, 100 subjects with type 2 diabetes mellitus were included in the study group (Group B) and 100 healthy subjects were considered as controls (Group A) for comparison. The subjects were selected from BIRDEM hospitalDhakaand personal contact from Dhaka. The study parameter wasplatelet count whichwere estimated in the Department of Hematology of BIRDEM hospital, Dhaka. The data was collected and recorded in pre-designed structured questionnaire by the researcher herself. For statistical analyses unpaired Student's't' test and Pearson's correlation coefficient (r) test were performed as applicable using SPSS for windows version 19.In this study,platelet count level was significantly (P<0.001) higher in the study group than that of control group. From this study,it may be concluded that estimation of platelet count might be beneficial for prediction of future cardiovascular risk in adult diabetic male.

Introduction

Diabetes mellitus is a syndrome of impaired carbohydrate, fat and protein metabolism caused by either lack of insulin secretion or decreased sensitivity of the tissues to insulin. There are two general types of DM, one is type I or insulin dependent diabetes mellitus (IDDM) and other is type II or non insulin dependent diabetes mellitus (NIDDM). Among them, type II diabetes is more common and about 90 to 95 % of all cases of DM1. According to WHO, diagnostic criteria of diabetes mellitus are fasting blood glucose ?7.0 mmol/l, 2 hour after glucose ?1.11mmol/l and HbA1c ?6.5%2.

Diabetes mellitus is a major global health problem. It is one of the most common non-communicable diseases worldwide. According to International Diabetes Foundation, it is the fourth leading cause of death in most high income countries. There is substantial evidence that diabetes mellitus is epidemic in many economically developing and newly industrialized countries 3.

Diabetes is undoubtedly one of the most challenging health problems in the 21st century. In the year 2011, among 366 million diabetic population of the world, about 23.7 million are in USA, 61.3 million in India and 8.5 million in Bangladesh. By the year 2030, about 29.6 millionpeople will be diabetic in USA, 101.2 million in India and 16.8 million in Bangladesh3. Prevalence of diabetes in Bangladesh was found 8.3% in the year of 2011, among them 15.2% in urban and 8.3% in rural population4.

Patients with DM have increased risk of developing micro and macrovascular diseases.The long term effects of microvascular complications of

Diabetesmellitus include retinopathy, nephropathy and neuropathy5.

Atherosclerosis is one of the major causes for developing macrovascular complications including coronary heart disease (CHD), stroke and peripheral arterial disease. Cardiovascular disease (CVD) is the leading cause of disability and premature mortality in patients with diabetes6.About 80% patients with diabetes may die due to thromboembolism. Among them, about 75% were due to cardiovascular complications and remainder due to cerebrovascular events and peripheral vascular complications7. Platelets are essential for primary hemostasis and endothelial repair.Platelet size, shape & number are the determinant of platelet function8. Altered platelet morphology and function have been reported in patients with DM.These plateletsplay a major role in pathogenesis of atherothrombosis and thereby increase risk of vascular diseasein diabetic patients9.

[OMTAJ 2018; 17 (2)]

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Larger platelets are hemostatically more active and act as a risk factor for developing atherothrombosis. Theselarge plateletsare younger, aggregate more rapidly with collagen and contain more dense granules and produce large amounts of thromboxane A2. Thus platelets exhibit hyper responsiveness to ADP or collagen induced aggregation10,11.

During platelet activation, atherosclerotic plaque is formed12. The plaque activates the plasma coagulation cascade and converted to a stable clot. This leads to vessel obstruction and increases risk of CVD6.

Platelet volume is a marker of platelet size and function. Measurement of mean platelet volume (MPV) introduced as a new method for the assessment of platelet activation. It is considered as a platelet function indices that reflect platelet production rate and stimulation13. Platelet distribution width (PDW) is another specific marker of platelet activation14.

Altered platelet indices act as a risk factor for arterial thrombotic events such as myocardial infarction, cerebral thromboembolism and transient ischemic attacks 15.So, platelet indices is an important, simple, effortless and cost effective tool that is used for predicting the possibility of impending acute events like myocardial infarction and cerebrovascular events16.

Many studies have reported higherMPV in diabetic patients. Mean platelet volume, a recent risk indicator for atherothrombosis, may be used for monitoring vascular complications of diabetes17.

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Meterials And Methods

This cross sectional study was done in the department of Physiology in Dhaka Medical College Dhaka in July 2013 to June 2014. Protocol of this study was approved by Ethical review committee of Dhaka Medical College and Diabetic Association of Bangladesh. For this study 100 male, age (40-60 years), diabetic subjects were selected from BIRDEM hospital and were included in study group A. These diabetic subjects were selected on the basis of their duration of with diabetes more than 3 years, FBG level ≥7.0 mmol/l and HbA1c ≥ 6.5 %. All the study subjects were on oral hypoglycemic drugs. Hundred healthy adult male were considered as control group B for comparison. After selection of the subjects, the nature, purpose and benefit of the study were explained to each subject in details. They were encouraged for voluntary participation. They were also allowed to withdraw from the study whenever they feel like. Informed written consent was taken from the participants. Before taking blood, detailed family and medical history were taken. Anthropometric measurement of the subjects was done and blood pressure was measured. All the information's were recorded in a prefixed questionnaire. With aseptic precaution, 5 ml of venous blood was collected from ante-cubital vein by a disposable plastic syringe from each subject for estimation of hematological and biochemical tests. HbA1c, FBG and platelet count level were estimated in the laboratory of the Biochemistry and Hematology Department of BIRDEM hospital. All the parameters were expressed as mean ± SD (standard deviation). For statistical analysis was done by unpaired Student's 't' test and Pearson's correlation coefficient (r) test. P value < 0.05 was accepted as level of significance. Statistical analyses were performed by using a computer based statistical program SPSS (Statistical package for social science) Version 19.

Results

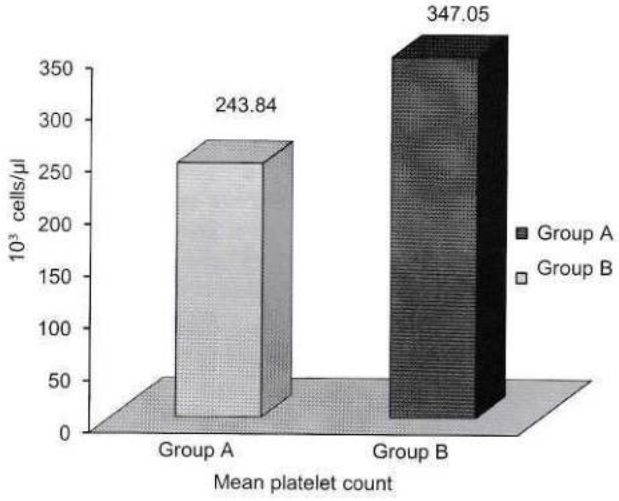
General characteristics are presented in table I.Subjects of two groups were matched in respectof age, height, weight, BMI and BP.All the values were within normal range. (Table-I)

Table 1: General characteristics of study subjects

parameters	Control (n = 100)	Diabetes male (n = 100)
Age (years)	53.58±4.75	54.72±5.73
Weight (kg)	61.43±7.20	63.46±7.21
Height (cm)	158.82±4.36	165.79±6.73
BMI (kg/m^2)	23.13±2.26	23.15±2.96
SBP (mmHg)	110.65±7.02	108.05±10.20
DBP (mmHg)	65.95±6.34	62.80±4.40

Results are expressed as Mean ±SD. Unpaired Student's't' test analyzed statistical significance. n = Number of subjects. BMI= Body mass index, SBP= systolic blood pressure, DBP= Diastolic blood pressure.

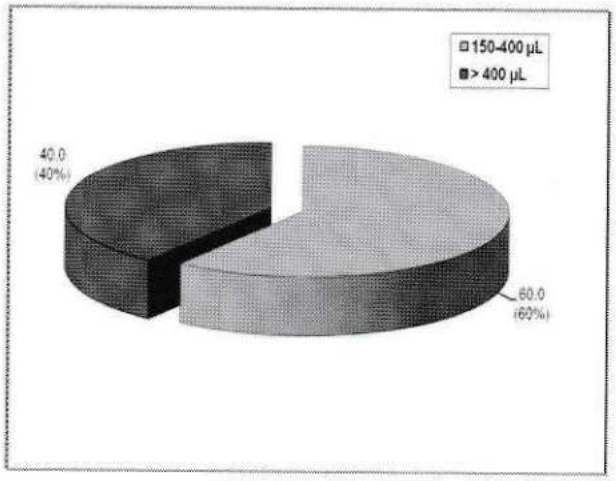
Figure I: Platelet count in both groups (n = 200)



Group A control & Group B is diabetic

Again, The mean (± SD) platelet count was 243.84 and 347.05 in group A and B respectively. The platelet count in group B was higher than that of group A which was statistically significant ($p < 0.001$). (Figure 1)

Figure II: Distribution of the subjects by Platelet count in study group (n = 100)



Frequency% of Platelet count in diabetic patients are showing majority of patients had abnormally high platelet count (n = 100) Cut point = 400µl

Moreover, in group B 60 (60%) patients were increased platelet count respectively (Figure II).

Discussion:

In the present study, mean platelet count was significantly ($p < 0.001$) higher in study group than control. Similar type of observations was found by some researchers15,18,19. There are some postulated mechanisms suggested by various researchers of different countries which may imply the possible mechanism regarding these changesin the present study. Plasma glucose concentration directly enhances the activation of arachidonic acid pathway leads to increased Thromboxane A2 formation. This thromboxane A2 is one of the potent platelet activators and contributes to hyperactivity of platelet in diabetic patients20.

In the diabetic platelets, there is increased mobilization of Ca2+ from intracellular storage pools. These intracellular Ca2+ responsible for platelet degranulation and causes platelet activation. Vascular NO activity is reduced in diabetes, leading to impaired endothelium-dependent vasodilatation and increased platelet aggregation21,22. Raised platelet values are commonly seen in inflammatory and infectious diseases. It seems likely that a high platelet count in diabetic patients is associated with some factor related to the pathogenesis of vascular disease. The recently discovered factor, trombopoetin, is of particular interest in this connection. It is also possible that elevated platelet count could be used as a prognostic indicator of future diabetic complications23.

Conclusions

The present study reveals that platelet counts are significantly higher in type 2 DM adultmale in comparison to healthy controls. Therefore,routine examinations of platelet count is importantto assess atherothrombosis,in DM in orderto prevent thromboembolic CVD in DM.

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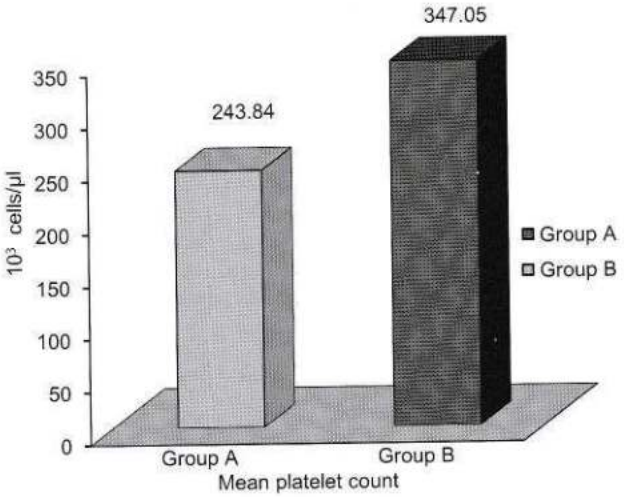

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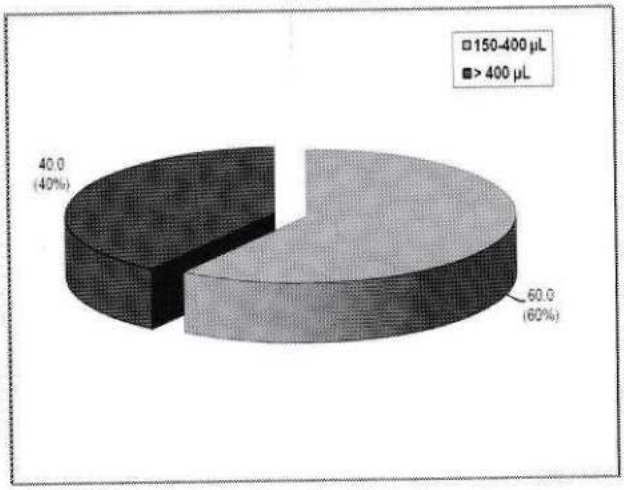

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ORIGINAL ARTICLE

The Osmani Medical Teachers Association Journal Volume 17 Number 2

Incidence and prevalence of head and neck cancer in a tartiary level hospital

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Abstract

Head and neck cancers (HNCs) display variable biological and geographical variation even within the same country. The purpose of this study was to represent prevalance and incidence of head and neck cancers in tartiary level hospital. HNC accounts for 21.2% of total body malignancy and 47% of all malignancies in males and 2.5% in females. Squamous cell carcinoma was the most common histological type (97%). Maximum incidence of HNC (>60%) was in 40–60 year of age. Male:female ratio was 3.5:1. Oral cancers were most common HNC in patients below 50 year age group, whereas carcinoma oropharynx and larynx were more common in patients above 40 year age group. Tobacco smoking was a most prevalent risk factor for carcinoma oropharynx, larynx, and hypopharynx. Tobacco chewing was a most prevalent risk factor in females, young males, and carcinoma buccal mucosa patients. Habit of tobacco consumption in HNC patients was much higher than their normal counterpart. Alcohols drinking alone was observed in <1% patient as a risk factor. In oral tongue cancer, smoking and tobacco chewing were equally prevalent. Habit of tobacco chewing and alcohol were significantly higher in carcinoma buccal mucosa than other HNC suggesting synergistic effect specific to this site.

[OMTAJ 2018; 17 (2)]

Introduction

Cancer is rapidly becoming a public health crisis in low- and middle-income countries.[1] It remains a leading noncommunicable disease in Bangladesh, and it is also emerging as a great burden when compared to infections that are ravaging the continent. The triad of ignorance, poverty, and poor health-seeking behavior makes Bangladesh vulnerable to the cancer burden, irrespective of gender and age.

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The head and neck cancer, which is the 7th most common malignancy worldwide, is a major global health problem with more than half million new cases each year.[2, 4, 5] Worldwide, almost 600,000 cases of this type of cancer occur in men and 270,000 cases in women, annually.[6] This type of cancer is one of the major causes of death in the world.[7] The geographical distribution of the cancers of the head and neck region shows considerable variation depending on the site.[2]

Approaches to minimize the burden of cancer in Bangladesh in the past few years have had little success. Reasons include low awareness of the cancer burden and a poor understanding of the potential for preventing cancer.[2]

Head and neck cancers (HNCs) are a wide range of malignant tumors found in anatomical sites, such as the oral cavity, ear, scalp, nasal cavities, paranasal sinuses, nasopharynx, hypopharynx, oropharynx, salivary glands, facial soft tissue, malignant neck masses, thyroid, and eye.[3] They present with various biological patterns and are unique due to delicate structures in the head and neck region.[3,4]

The occurrence of Head and Neck Cancer(HNC) malignant neoplasms is largely due to multiple factors which can be broadly classified as environmental and genetic.[5] Environmental factors include usage and consumption of tobacco and alcohol in various forms, improper nutrition, as well as oncogenic virus infection, such as human papilloma virus in laryngeal cancer.[3,6] Other causes include excessive consumption of Chinese-style salted foods, industrial pollution, medication use, and race.[7,8] Interactions between these factors have been reported to account for the development of HNC.[3,6,7,8]

Tobacco is the single most important modifiable risk factor (30%) for cancer. Smoking prevalence in Bangladesh is 41% among men aged 15 years and over. In women, it was 1.8% among those aged 15 years and over.[4]

The lesions clinically present in different ways depending on the anatomical site of tumor origin and stage of the disease. Early-stage HNCs often present with diverse and on occasion unspecific signs and symptoms. However, a number of HNCs present late due to the obscure nature of their anatomical site of occurrence, thereby making early diagnosis and management difficult.[4]

The symptoms are according to the primary site of origin. These are difficulty in taking food, change of voice, respiratory distress, nasal obstruction, bleeding from the nose, swelling in the neck and pain in the different sites of head and neck which starts from above the chest to up to the top of the head.

Thyroid gland is situated in the neck and secretes thyroid hormones which are essential for life. 3% of all cancers occur in the thyroid gland. 95% thyroid cancers have good prognosis after surgery. Thyroid cancers spread quickly in the lymph nodes, lungs and bones. The major challenge for thyroid surgery is saving the recurrent laryngeal nerve which controls the voice and preservation of parathyroid glands which maintains the blood calcium level. Various histological types of HNC have been identified;[3,5,6,9] with squamous cell carcinoma (SCC) reported to account for over 90% of HNCs[5,6,9,10] and lymphomas for 10% constituting the second most common primary malignancy of the head and neck region.[3]

Accounting for 5%–50% of all cancer globally, South Asia and parts of central and southern Europe have the highest incidences[7] with approximately 30% of all cancers in India, 3.3% of all cancers in the United States, 4.2% in Europe, and about 1.2% in Nigeria.[6,7]

Clinically, HNCs are associated with significant loss of vital functions such as breathing, speech, and swallowing. Definitive diagnosis is through histology while imaging is used for staging and treatment. Patients in this environment usually present late, and treatment is financially and psychologically demanding.[3]

Globally incidence of HNC is higher in males compared to females. India has the highest rate of HNC among females (Sankaranarayanan et al., 1998). Mean age of presentation lies in the 5th-6th decade for the Asian population as compared to 7th-8th decade among the North American population (Jacques et al., 2011). Incidence of oral cancer in South-East Asia and of oral cavity plus nasopharyngeal cancer in East Asia follows the global HNC pattern. The gold standard for HNC treatment is multimodal with the use of surgery, radiotherapy, and chemotherapy and often involves the maxillofacial surgeons, otolaryngologists, histopathologist, dentists, nurses, psychiatrists, therapists, social workers, and others.[11] In most centers in low- and middle-income countries, surgery is principally the mainstay of treatment as few places possessed the facilities for chemotherapy and radiotherapy. In spite of several decades of progress and improvements in treatment and supportive care, the prognosis has remained unacceptably low for this group of patients stagnating at about 50% 5 years survival rate.[11]

The World Health Organization International Statistical Classification of Diseases-10 (ICD-10) classification system used for this study helps to standardize and serves as useful reference for assessment and monitoring of mortality, morbidity, and other relevant parameters related to HNC tumors and other health issues.[13]

Materials and method

This is an observationl study.Otolaryngology and Head-Neck Surgery department, sylhet MAG Osmani Medical college Hospital,sylhet. Total number of biopsy specimen submitted were obtained from the register then the number of head and neck biopsies were sorted out. Above retrieved data was collated on the basis of age, gender, site of biopsy and histopathological diagnosis. Data collected were classified on the basis of ICD-10.

Datas included the information of incidence rate, sex incidence , in relation with smoking and any alcohol or tobacco consumption, histological subtypes the sites of cancer involved . And the results regarding the treatment duration , type of biopsies , type of carcinoma affecting the maximum were all related with the age group from <40years to >60years and to both sex. All these comparison was done with the SPSS version software and the analysis are tabulated below. we excluded neoplasms of the eye and central nervous system. Some clinical information such as gender, age, primary tumor site and type of cancer (carcinoma, sarcoma, melanoma, metastatic, or primary) were obtained from medical records. The cases with incomplete demographic information and the cases which its histopathological diagnosis could not be verified were excluded from the study.

Results

Study population consists of 86 males and 24 female patients of HNC. Male:female ratio was 3.5:1. More than 97% cases were squamous cell carcinoma. Difference in incidence in males and females was significant in each age group ($P < 0.05$). Maximum incidence of HNC was found in 41–50 year age group (34%) but in male incidence was almost equal in 51–60 and 41–50 age group . More than 60% of the patients were 41–60 year of age [Table 1].

Most common site of HNC was oral cavity (n = 15) followed by oropharynx (n = 30) and larynx (n = 22). Malignancy arising from hypopharynx (n = 22), nose and paranasal sinuses (PNS) (n = 1), and nasopharynx (n = 1) were uncommon. Secondary neck with unknown primary constituted 5% of all HNC. Tumors arising from salivary glands (n = 2), thyroid (n = 4), external auditory canal (n = 1), ear pinna (n = 1), and eyelid (n =) all together account for <2% of HNC. Most common subsite of HNC was base of tongue (BOT) (23%) followed by buccal mucosa (5.7%). Oral tongue (8%) and supraglottic larynx (18%) had equal incidence [Table-ii].

Table 1: Distribution of case based on age group and gender (total=110)

Age	Total	Male	Female
<30 yrs		8	1
30-40 yrs		16	3
41-50 yrs		28	12
51-60 yrs		26	6
61-70 yrs		5	1
71-80 yrs		3	1
total	110	86	24

Table ii: Distribution of case based on site of disease(total=110)

Site	Subsite	Percentage
Oral cavity	Oral tongue Buccal mucosa	9(8%) 6(5.7%)
Oropharynx	Base of the Tongue Tonsil	25(23%) 5(4.5%)
Larynx	Supraglottic Glottic	20(18%) 2(2%)
Hypopharynx	Pyriform fossa	22(20%)
Nasopharynx		2(2%)
Others	Thyroid Salivary glands Unknown Primary Ex. Auditory canal Basal cell carcinoma	4(3.7%) 2(2%) 11(10%) 1(1%) 1(1%)
Total		110

Oral cancer was most common HNC in <40 year age groups and ranked second and third, respectively, in 41–50 and above 50 age groups. Oropharynx was most common HNC in more than 40 year age groups. Carcinoma larynx has shown consistent increase in incidence with an increase in age and ranked second common HNC in more than 50 year age groups. Secondary neck with unknown primary presents 5–8% of HNC in all age groups. Cancer arising from salivary glands, nose, and PNS were more common in <50 year age group [Table- iii].

Table-iii: Distribution of case according to age group and site of tumor (total=110)

Age	Oral cavity	Oropharynx	Larynx	Hypopharynx	Nasopharynx	Others
<30 ys	1	1	1	2	0	0
30-40 yrs	8	3	2	4	1	3
41-50 yrs	2	16	6	9	0	2
51-60 yrs	2	7	6	4	1	2
61-70 yrs	1	2	5	2	0	1
71-80 yrs	1	1	2	1	0	1
Total	15	30	22	22	2	9

Table-iv: Distribution of risk factor in relation to gender in study population (total=110)

Risk factor	Male	Female	Total
Smoking + alcohol	24(35%)	0(0%)	24(35%)
Smoking	8(12%)	0(0%)	8(7.4%)
Smoking + chewing	21(31.2%)	1(4%)	22(20%)
Smoking + chewing + alcohol	25(37%)	1(4%)	26(24%)
chewing	5(7.4%)	16(67%)	19(17.3%)
others	3(3.5%)	6(25%)	9(8.3%)
Total	86	24	110

In this study, tobacco smoking and alcohol was found to be most prevalent risk factor in total (35%) as well as in male patients (35%). Tobacco chewing only was uncommon (7.4%) in males but in combination with smoking, it accounts second common risk factor (35%). In female patients, most prevalent risk factor was tobacco chewing (67%) followed by smoking (4%) and smoking with tobacco chewing (4%). Alcohol addiction was rare (<1%) in females while in males, it was found

either with smoking (35%) or with smoking and chewing tobacco (31.2%). [Table 4]. In <30 year age group, tobacco chewing (26.7%) was a most common risk factor, smoking (13.3%), smoking with tobacco chewing (15.5%), and smoking with chewing and alcohol consumption (13.3%) had equal prevalence. Above this age group, smoking alone was most prevalent risk factor and found in 34–50% of each age group. Smoking with tobacco chewing and alcohol was much common in below 50 year age groups.

Table-V: Distribution of risk factor in relation to Site of Tumer in study population (total=110)

Risk factor	Oral cavity	Oropharynx	larynx	hypopharynx	nasopharynx	others
Smoking + alcohol	2	4	5	3	5	2
Smoking	2	5	4	2	2	3
Smoking + chewing	7	20	2	1	1	2
Smoking + chewing + alcohol	6	11	2	3	2	2
chewing	5	3	1	1	1	1
total	22	43	14	10	11	10

Table-VI: Distribution of Carcinoma in relation to gender in study population (total=110)

Histologic type	Sub tyype	male	female	total
carcinoma	Sq cell ca	79	19	98
	Basal cell ca	1	0	1
	Adeno ca	1	0	1
	Adenocytic ca	0	1	1
melanoma		0	0	0
lymphoma	Hodgekin	1	1	2
	Non hodgekin	1	1	2
Metastatic cancer		2	2	4
Others		1	0	1
total		86	24	110

Discussion

This study is observational and hospital-based, which includes histologically confirmed cases of HNCs. Study population is mixture of rural, urban, and suburban population. As per various studies published squamous cell carcinoma varying from 88% to 96%[4-7] is the most common histological subtype. In our study, squamous cell carcinoma was observed in more than 97% cases. Prevalence of HNC with respect to total body malignancies varies from 9.8% to 42.7%,[8-11] and it accounts for 30% of all cancer in males and 11–16% in females. Male:female ratio is commonly 1:1–3.1:1.[4,6,12

From this study out of that 110 (86 males and 24 females) were of HNCs, which represents 78% of males and 22% in female cancer. Male:female ratio was 3.5:1. Prevalence of tobacco consumption increases up to the age of 50 years and then there is decline in Indian population.[20] In this study, maximum number of HNCs are present in 41–50 year of age and >60% of HNC were found in 41–60 year of age. Prevalence was equal in 41–50 year and 51–60 year age group in males. Smoking is relatively more pronounced factor for cancer of pharynx (relative risk [RR] =8.5) and larynx (RR = 7.5) thancancer of oral cavity (RR = 4.9).[21] In this study, smoking was present in >80% cases of cancer of oropharynx, larynx, and hypopharynx and only 50% cases of oral cancer. There is 6-fold higher risk of oral cancer among the people having habit of betel nut and tobacco (gutkha).[22] In this study, tobacco chewing including betel nut was present in >60% cases of oral cancer and only 30% of pharynx and larynx cancer. This habit was found to be more common in younger age group and female patients that may be the reason for oral cancer as most common cancer in this group. Bidi-smoking, betel quid (paan) and areca nut chewing is practiced among rural females, but to a lesser extent compared to males. This could also be due to the prevailing local socio-cultural mindset facilitating males to better healthcare accessibility leading to higher diagnosis in them. India also reports the highest incidence of head neck cancers in females in comparison to other parts of world (Sankaranarayanan et al., 1998).

Comparing risk factors of cases of carcinoma oral tongue and buccal mucosa, there was a significant difference ($P < 0.001$). Tobacco chewing was more prevalent in male. Smoking was more prevalent in oral tongue but tobacco chewing and smoking or tobacco chewing along with smoking and alcohol is more prevalent in buccal mucosa which suggests synergistic effect of tobacco and alcohol on buccal mucosa but no similar effect on oral tongue In study population, HNC prevalence was very low in females and male:female ratio was exceptionally high. A detailed study on this population can find associated factor responsible for this difference which could be used for prevention of HNC in other population. In this study, secondary neck with unknown primary constituted 5% of all HNC. Habit of smoking or

smoking with alcohol was present in 60% cases. Primary can be detected in more than 50% of these patients after pan-endoscopy guided biopsy and PET scan. Primary commonly lies in nasopharynx, oropharynx, or pyriform fosse. These sites have a strong association with smoking which could explain habit of smoking in more than half of these patients. In carcinoma nasopharynx, habit of smoking and smoking with alcohol was present in around 70% cases shows strong association between them. In two studies in Japan[13]and Malaysia[14], the most common site of the head and neck cancer was the larynx (45.9% and 28.7% respectively).Larynx cancer is the second most common respiratory tract cancer, after lung cancer and its incidence has increased in many parts of the world. [6] This increased incidence rate is probably associated with changes in alcohol and tobacco consumption.[6] Larynx cancer was the fourth most common cancer (10%) in our study.

Conclusion

HNCs are one of the most common malignancies prevalent in India with wide variations in risk factors, sites of involvement, geographical, and demographic characteristics. Heterogeneity in risk factors and differences in the prevalence of HNC at different sites of head and neck region may be because of differences in surface area, microanatomy, tissue microenvironment, and duration of exposure to carcinogens which need to be explored.

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