ISSN : 2313-4919
Recognized by BM & DC

Ad-din Sakina Women's Medical College Journal

Volume 4 Number 2 July 2023

CONTENTS

Official Journal of
Ad-din Sakina Women's Medical College
www.aswmc.edu.bd

Ad-din Sakina Women's Medical College Journal

Published by
Principal
Ad-din Sakina Women's Medical College
Pulerhat, Jashore-7402. Phone: 0421-71743
Email: principalaswmc@gmail.com
Pulerhat, Jashore

Address of Correspondence
Editor-in-Chief
Ad-din Sakina women's medical college journal
Email: drmarufabio@gmail.com
WhatsApp: 01715219963

REGARDING THE JOUNAL

Full Name of the Journal	Ad-din Sakina Women's Medical College Journal
Abbreviated Form	*ASWMCJ*
Type of Publication	Peer Reviewed, Bi-Annual
Published by	Ad-din Sakina Women's Medical College
ISSN No.	2313-4919
Recogtion	BM & DC
Address	Pulerhat, Jashore-7402, Bangladesh

The Ad-din Sakina Women's Medical College Journal welcomes the submission of manuscripts including original articles, case reports, review articles, image, short communication and letters to editor. The Journal covers all the fields of medical science and it is the official publication of Ad-din Sakina Women's Medical College. The Editorial board reserves the right to edit, accept and reject submitted manuscripts.

Instructions to authors

All submissions must be in the English language. Articles are accepted for publication on condition that, it was submitted only to the Ad-din Sakina Women's Medical College Journal.

Neither the editors nor the publishers are responsible for the views and statements of authors expressed in their contributions. It is the author's responsibility to obtain permission to reproduce illustrations, tables etc. from other publications.

The followings are the minimum requirements to submit paper for publication, which is based on Uniform Requirements for Manuscripts Submission to Biomedical Journals recommended by the International Committee *of Medical Journal Editors (ICMJE).Website of ICMJE is www.icmje.org.*

Format for manuscript

1. Typing should be on one side of the A4 size paper in English.
2. Manuscript should have uniform style, correct journal format, carefully proof-read for grammar, spelling and punctuation.
3. Manuscript should be submitted in Microsoft Word file using font size 12 Calibri (Body) characters, double-spaced except for abstract and author's information where single space is required and with 1.5 cm margins on top and left and 1 cm on right and bottom.
4. All authors' names, posts, affiliation at the time they did their work and their highest academic degree(s), cell phone numbers and e-mail addresses should be included. The name of the corresponding author should be mentioned.
5. A cover letter must be signed by the corresponding author and co-author(s). The letter must include the following statement: "This manuscript is my/our own work, it is not under consideration by another journal, and this material has not been previously published."
6. Abstract and key words in the first page followed by the text, prepared in the format of Introduction, Methods, Results, Discussion and Conclusion.

Requirements

1. Three typed copies (hard copies) of the article and one soft copy in MS Word (*.doc format only) attached with e-mail should be submitted to the Editor-in-chief.
2. Manuscripts of rejected articles are not returned, but the principal author or the author for correspondence will be informed about the rejection of the article.
3. Standard abbreviations may be used. Avoid abbreviations in the title and abstract. However, the full term for which an abbreviation stands should precede its first use in the text unless it is a standard unit of measurement.
4. Statistical procedure should be described in the methods section supported by reference.
5. The Editor reserves the customary right to style and if necessary, shorten the material for the acceptance purpose, to determine the priority and time of publication. Editor assumes that the submitted work will be based on honest observations. It is not a task of the editor to investigate scientific fraud paper.

Criteria for submission of original manuscripts

The authors are requested to strictly follow the guidelines for submission of manuscript to Ad-din Sakina Women's Medical College Journal for publication. The following documents with manuscripts are to be submitted.

• A cover letter addressed to the Editor-in-chief of the journal (Sample given at the end)
• A title page

In general, original article should be divided into following sections:

a. Title page
b. Abstract
c. Introduction
d. Methods
e. Results (Tables with titles and Figures with legends)
f. Discussion
g. Conclusion
h. Acknowledgement (if any)
i. References

Each of the sections is to start on a separate page. Page should be numbered consecutively beginning from the abstract.

Title

• Should be short (not more than 15 characters) & specific
• Providing a distinct description of the complete article
• Should include the names of all authors with their designation & their affiliations
• Name of the department and institution where the work has been carried out
• The address of the corresponding authors including contact number & email address
• Disclosure of conflict of interest if any
• Subtitles may be used to amplify the main title

Abstract

• Title of the article
• Authors name should not be given
• Preferably within 250 words
• Avoid abbreviations in the title and abstract except standard abbreviation (eg: DNA)

Introduction

• Statement of the problem with a short discussion of its importance and significance
• Review of the literature(s) related to the problem with pertinent reference
• Objectives/hypothesis/benefits should be clearly stated

Methods

• Research type, place and time
• Description of research variables
• Discussion of research population
• Selection criteria (Exclusion criteria if any)
• Approval of the research involving human subjects by ethical review committee (IRB/ERC) and description of the ethical aspects in such research
• Description of procedure, methods, apparatus, drugs or chemical as applicable
• Statistical procedure should be described and supported by reference

Result

• Present results in a logical sequence in text, table and illustration with most important finding first
• Figure should be numbered as Fig. 1 and table in Roman numerical (Tab. I)
• Do not duplicate data in table and figure
• Table and figure not supportive to the research are strictly discouraged
• Do not use internal horizontal and vertical rules

References

• Should be followed the Vancouver Format
• Should be numbered consecutively as superscript and should appear on top of the line after the punctuation
• At least 15 references should be included
• At the end of the paper these should be listed in numerical order according to the order of citation in the text

Criteria for submission of review article

• Reviews are evidence-based articles about a specific topic using relevant citations from the most recent literature with the authors' conclusions on this subject
• The author is expected to have conducted

research on the subject and to have experience in order to discuss and analyze the subject. The text should be ranging from 2000-10,000 words excluding the title, abstract, references and tables. Please provide 3-5 keywords or short-phrases (preferably MeSH terms)

Criteria for submission of case report

• Rare Cases with educational value for practicing doctors should be reported.
• Length should not exceed 1000 words excluding the abstract, references and tables and no more than 10 references
Authors must ensure that the patient's identity is protected both in the text and pictures before submitting the report.

Criteria for submission of short communication

• Short communication is accepted when the research topic, aim and results of the research are in limited in scope and in cases that do not require writing a full original article.
• Short communication can be described as a summarized version that have been prepared according to the structure of research articles
• Abstracts should not exceed 100 words and the text should be restricted to a maximum of 1000 words

Criteria for submission of evidence-based commentary

These are short reports based on a focused question arising from a clinical encounter, and accompanied with a summary of the appraised evidence.

Criteria for submission of letters to editor and comments

Letters to the editor or comments can be sent to provide commentary and analysis concerning an article published in the journal, to give information about ongoing research to draw attention to a particular subject. It may include an optional title, tables and references. These articles should not exceed 1000 words.

To
The Editor-in-Chief
Ad-din Sakina Women's Medical College Journal
Pulerhat, Jashore.

Subject: Submission of article for publishing in Ad-din Sakina Women's Medical College Journal.
Dear Sir,

I would like to submit an original research manuscript entitled "..... ....." for publishing in your highly esteemed journal.

I hope you will be kind enough to publish the manuscript in the journal at your earliest convenience.

Sincerely yours,
Dr.----------
Degrees:----------
Designation:----------

E-mail address:----------
Contact no:----------

Undertaking

We the undersigned giving an undertaking to the following effect with regard to our manuscript titled "....." for publishing in Ad-din Sakina Women's Medical College Journal.

1. The manuscript mentioned above has not been published or submitted to or accepted for publishing in any form, in any other journal.
2. We also vouchsafe the authorship of this article not be contested by anyone whose name(s) is/are not listed here.
3. We also agree to the authorship of this article in the following sequence.

Authors name (in sequence) signature of author with date

1. Dr.----------
2. Dr.----------
3. Dr.----------
4. Dr.----------

Editorial

2023 Dengue Outbreak: Bangladesh Perspective

*Akhter M

Dengue fever (DF) is an infectious disease caused by one of four serotypes of the dengue virus (DENV) and spread by the bite of an infected Aedes mosquito.[1] DENV is a single-stranded RNA virus including four serotypes (DEN-1 to 4), belonging to the genus Flavivirus of Flaviviridae family. It is important to acknowledge that dengue can be caused by any one or more than one of the four serotypes of DENV and someone infected with any one serotype acquire lifelong immunity to that particular serotype. It is also well recognized that subsequent dengue infections with different DENV serotypes exaggerate the risk of developing severe dengue.[2] Dengue is considered one of the top ten global threats according to World Health Organization (WHO).[3] This year Bangladesh is experiencing the deadliest outbreak of DF since the first outbreak in 2000 in this country. Directorate General of Health Services (DGHS) of Ministry of Health and Family Welfare, Bangladesh registered 2,57,060 hospitalized cases and 1,272 dengue related deaths from 1st January 2023 to till date (23rd October, 2023).[4] Understandably total number of dengue cases would be much higher as majority of the patients do not require hospitalization and receive treatment in their home. In this year the dengue outbreak in Bangladesh have already exhausted the medical resources especially in Dhaka city where the intensity and fatality is fairly higher when compared with rest of the country. Now dengue has spread to all 64 districts of Bangladesh. Average case fatality rate (0.5%) and total number of deaths (1,272) this year (up to 23rd October) have already outnumbered all previous records since the first dengue outbreak (2000) in Bangladesh.[4]

Dengue infection is a systemic disease with a wide clinical spectrum that includes both severe and non-severe clinical presentation.[5] After the incubation period (3-10 days), the illness begins abruptly and is followed by three phases – febrile phase (2-7 days), critical phase (24-48 hours) and recovery phase (48 -72 hours).[6]

40%–80% dengue infections are asymptomatic. Most of the symptomatic dengue presents with mild to moderate fever. Only ≤5% of all dengue cases develop severe, life-threatening disease. For the diagnosis of DF early clinical findings are nonspecific and sometimes not conclusive, but recognizing early signs of shock and rapidly initiating intensive supportive therapy can reduce the risk of mortality among patients with severe DF.[7] New revised WHO dengue classification by severity recommended as follows: A) Dengue without warning signs: Group A (Home management). B) Dengue with warning signs and DF with co-morbid conditions: Group B (Require in-hospital care). C) Severe dengue: Group C (Require emergency management in a tertiary care hospital). Warning signs for dengue include, severe abdominal pain or tenderness, persistent diarrhea (> 3 times/day) and/or persistent vomiting (> 3 times/day), clinical fluid accumulation, mucosal bleed, lethargy, restlessness, liver enlargement > 2 cm and increase in hematocrit (Hct) concurrent with rapid decrease in platelet count. DF with high risk/co-morbid conditions include – infants, old age, diabetes, hypertension, pregnancy, coronary artery disease, immunocompromised patient and patient on steroids, anticoagulants and immunosuppressant. DF with severe dengue is defined by one or more of the following: (i) plasma leakage that may lead to shock (dengue shock) and/or fluid accumulation, with or without respiratory distress, and/or (ii) severe bleeding, and/or (iii) severe organ impairment (liver, heart,

brain, kidney etc.), and/or (iv) metabolic and electrolyte abnormalities.[6]

Symptomatic dengue infection have four types of clinical presentations such as, DF, dengue hemorrhagic fever (DHF), dengue shock syndrome (DSS) and expanded dengue syndrome (EDS).[8] Diagnostic criteria for DF include: live in or travel to dengue endemic area presenting with fever and 2 of the following criteria – nausea and/or vomiting; rash; aches and pain; positive tourniquet test; leukopenia (WBC < 5000 cells/mm³); platelet count ≤ 150,000 cells/mm³; rising Hct by 5-10% and any of the warning sign mentioned above. Diagnosis should be confirmed by laboratory tests.[8]

Clinical criteria for DHF are, high continuous fever for 2-7 days; hemorrhagic manifestations - tourniquet test positive, petechiae, epistaxis and hematemesis etc; ± liver enlargement; ± shock. Supportive laboratory evidence for dengue hemorrhagic fever are, i) evidence of plasma leakage evident by rising Hct ≥ 20%, pleural effusion, ascites, hypoalbuminemia (serum albumin < 3.5 g/dl). It is to be noted that, key differentiating point between DF and DHF is evidence of plasma leakage.[8]

Clinical signs of DSS include - cold extremities; delayed capillary refill time; lethargy or restlessness (possibly as a result of reduced brain perfusion); tachypnea or Kussmaul's breathing; tachycardia; weak pulse; narrow pulse pressure (pulse pressure ≤ 20 mmHg) and hypotension (systolic pressure < 90 mmHg for adults and children aged > 5 years and < 80 mmHg for children aged < 5 years).

EDS denotes unusual manifestations with severe organ involvement such as liver, kidneys, brain or heart associated with dengue infection reported in DHF and also in DF who do not have evidence of plasma leakage. These unusual manifestations may be associated with co-infections, co-morbidities or complications of prolonged shock.

Laboratory tests commonly performed in dengue infection are as follows: from day 1 to 5 of fever - CBC, NS1 antigen, ALT and AST is done. After day 7 of fever - IgM and IgG antibodies (day 5-7 window period) are done. Follow up testing may be done on 1st afebrile day, but should be done daily when DHF is suspected. A regular Hct is more important for management than the thrombocytopenia. In severe dengue, especially with shock, even hourly Hct is crucial for management.[8] Other organ function tests should be done, as indicated (CXR, ECG, echocardiogram, cardiac enzymes, renal and liver function tests, serum electrolytes, arterial blood gas analysis etc.). Physicians should strictly adhere to the dengue management guidelines provided by DGHS, Bangladesh and WHO; current updates are readily available in the respective websites.

Undeniably, vector (Aedes mosquito) control and personal protective measures for safety against mosquito bites are the mainstay of dengue prevention.[9]

As of 2023, there are two commercially available vaccines, sold under the brand names Dengvaxia (CYT-TVD) and Qdenga (TAK-003 / DENVax). Several countries of the world approved the use of these dengue vaccines with some recommendations. Until now, no dengue vaccine has been approved in Bangladesh.[10] Third phase trial of a dengue vaccine, supposed to be effective against all 4 serotypes is being conducted in Bangladesh, by the researchers from International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B) and the Larner College of

Medicine at the University of Vermont (UVM), USA. This is a single-dose tetravalent dengue vaccine (TV005) which demonstrated safety and immune responsiveness in children and adults.[11] An effective and safe vaccine might be a game changer, until then we should focus on vector control and personal protective measures to safeguard ourselves from mosquito bites and adhere to available standard management protocols to save lives.

Prof. Dr. Marufa Akhter.
Professor, Dept. of Biochemistry, Ad-din Sakina Women's Medical College, Jashore.

***Correspondence:** E-mail - drmarufabio@gmail.com

References:

1. Guzman MG, Harris E. Dengue. The Lancet. 2015;385(9966):453-465. doi:10.1016/S0140-6736(14)60572-9

2. Narayanan M, Aravind MA, Thilothammal N et al. Dengue fever epidemic in Chennai - a study of clinical profile and outcome. Indian Pediatr. 2002 Nov;39(11):1027-1033. PMID: 12466573.

3. Ten threats to global health in 2019. [cited 13 Oct 2022]. Available at: https://www.who.int/news-room/spotlight/ten-threa ts-to-global-health-in-2019.

4. Government of the People's Republic of Bangladesh. Management Information System (MIS). Health Emergency Operation Center & Control Room. Dengue Press Release – 21 September, 2023. https://old.dghs.gov.bd/index.php/bd/home/5200-daily-dengue-status-report

5. Rigau-Pérez JG, Clark GG, Gubler DJ et al. Dengue and dengue haemorrhagic fever. Lancet. 1998 Sep 19;352(9132):971-7. doi: 10.1016/s0140-6736(97)12483-7. PMID: 9752834.

6. Dengue: Guidelines for Diagnosis, Treatment, Prevention and Control: New Edition. Geneva: World Health Organization; 2009. PMID: 23762963.

7. Dengue. CDC Yellow Book 2024. https://wwwnc.cdc.gov/travel/yellowbook/2024/infections-diseases/dengue#clinical

8. National Malaria Elimination & Aedes Transmitted Diseases Control Program. Disease Control Division. Directorate General of Health Services Mohakhali, Dhaka-1212. Pocket Guideline for Dengue Clinical Case Management 2022 (Revised).

9. Ong EP, Obeles AJT, Ong BAG et al. Perspectives and lessons from the Philippines' decades-long battle with dengue. Lancet Reg Health West Pac. 2022 Jun 24;24:100505. doi: 10.1016/j.lanwpc.2022.100505. PMID: 35789734; PMCID: PMC9249805.

10. World Health Organization (11 August 2023). Dengue – Bangladesh. Available at: https://www.who.int/emergencies/disease-outbreak-news/item/2023-DON481

11. Safety and durable immunogenicity of the TV005 tetravalent dengue vaccine, across serotypes and age groups, in dengue-endemic Bangladesh: a randomised, controlled trial. Mary-Claire R Walsh, Mohammed Shafiul Alam, Prof Kristen K Pierce et al. THE LANCET Infectious Disease. Published: September 27, 2023. doi: https://doi.org/10.1016/S1473-3099(23)00520-0

Original Article

Perioperative Glycemic Status Affects Postoperative Outcome in Diabetic Patients

***Hanif M[1], Tasnim M[2], Saha SP[3], Hamid A[4], Rahaman MA[5]**

Abstract

Background: *Stress response during surgery may lead to hyperglycemia, osmotic diuresis and hypoinsulinemia may increase the risk of postoperative infections. The aim of the study was to find out the effects of perioperative glycemic control on postoperative outcome.* ***Material and Methods:*** *This prospective study was carried out in Ad-din Women's Medical College Hospital, Dhaka from June 2022 to December 2022 among 50 diabetic patient who were selected for various general surgery.* ***Results:*** *Among 50 study cases, only 06 (12%) developed various complications but rest of them (majority cases), 44 (88%) did not develop any complication. Among the 6 (12%) patients who developed various postoperative complications, comprised surgical site infections (49.34%), delayed wound healing (83.34%) and diabetic ketoacidosis (33.34%). These patients with postoperative complications had postoperative blood sugar level 10.0 to 14.0 mmol/l.* ***Conclusion:*** *Good long term glycemic control significantly lowers the postoperative infections.*

Keywords: Perioperative glycemic control, Postoperative blood sugar, Postoperative complications.

Received: 24.03.2023, **Accepted:** 29.03.2023.

Ad-din Sakina Women's Medical College Journal. 2023; 4 (2) : 04-09

Introduction

Diabetes mellitus accelerate length of hospital stay, increase in patient's expenses and also morbidity. Hospital stay of diabetic patients in surgical wards are 45% greater than diabetic patients admitted in medical wards.[1,2] Moreover, the perioperative mortality rate is up to 50% higher in diabetic patients than that of the non-diabetic patients.[3] Poor glycemic control in perioperative period leads to different metabolic complications during post-operative period.[4] Development of complications in diabetic patients after surgery mainly depend on various factors such as age, diabetic treatment regimen, level of control of glucose, pre-existing complications or illness, malnutrition, length of time with diabetes and general physical fitness.[5] The American Diabetes Association (ADA) has endorsed a target glucose range for the perioperative period of 80 to 180 mg/dl (4.4 to 10 mmol/L) though optimal perioperative glucose target has not been rigorously established. [6] Evidence of excellent glycemic target in diabetes is random glucose <170 mg/dl (9.4 mmol/L) or fasting glucose <126 mg/dl (6.9 mmol/L) and evidence of good control of diabetes is random glucose <220 mg/dl (12mmol/L) or fasting glucose <140 mg/dl(7.8mmol/L).[7] During stress like surgery and general anesthesia a neuroendocrine stress response releases counter regulatory hormones such as epinephrine, glucagon, cortisol, growth hormone and of inflammatory cytokines such as interleukin-6 and tumor necrosis factor-alpha leading to metabolic abnormalities including glucose utilization, impaired insulin secretion, increased lipolysis and protein catabolism leading to hyperglycemia and even ketosis.[8–17] Some researchers stated that the risk of various postoperative complications are high in diabetic patients such as: hyperglycemia or hypoglycemia, dehydration, hyperglycemic hyperosmolar syndrome (HHS); a situation of high glucose levels,

1. Dr. MD. Hanif, Assistant Professor, Department of Surgery, Ad-din Medical College Hospital, Dhaka.
2. Lt. Col. Dr. Masuma Tasnim, Combined Military Hospital, Dhaka.
3. Dr.Shib Prosad Saha, Assistant Professor, Department of Anesthesiology, Ad-din Sakina Women's Medical College, Jashore.
4. Dr. Col. Abdul Hamid, Deputy Commandant, Combined Military Hospital, Dhaka.
5. Dr. Md. Ashiqur Rahman, Assistant Professor, Department of Orthopedic Surgery, Ad-din Sakina Women's Medical College Hospital, Jashore.

***Correspondence:** E-mail: edr.emon@gmail.com

dehydration, decreased consciousness, diabetic ketoacidosis (DKA), impaired wound healing, increase risk for infection and sepsis.[18,19]
Hyperglycemia leads to delayed wound healing, increased susceptibility to infection, and probable loss of administered nutrients through glycosuria.[20] During surgery stress hormones causes insulin deficiency leading to impaired glucose metabolism resulting in increased fat burn for energy. So, toxic acid by-products called ketones build up in the blood and causes diabetic ketoacidosis (DKA). People with diabetes are more likely to have poor circulation, nerve damage, weakened immune systems causing impaired wound healing, slow wound healing and increase risk for infection.[18,19] Patients with diabetes have a higher incidence of morbidity and mortality following surgery and have an increased length of stay in hospital.[21–23]

In surgical patient, there is a strong correlation between perioperative hyperglycemia and increased complications following surgery. Preoperative glycemic control also influences the risk of postoperative wound infections. So, the aim of the study was to evaluate the effects of tight glycemic control of blood over postoperative complications in diabetic patients.

Materials & Methods

This was a prospective study conducted in the Department of Surgery in Ad-din Women's Medical College Hospital, Dhaka from June 2022 to December 2022. A total number of 50 diabetic patients with age range 40 to 70 years admitted for surgery like laparoscopic cholecystectomy, hernitomy, hemorrhoidectomy and other gastrointestinal surgeries were purposively selected for the study. Following surgery patients unwilling to participate in the study and had history of heart disease, liver disease, kidney disease, any chronic diseases were excluded from the study. Planned, non-emergency surgical procedure, may be either medically required or optional surgery were considered as case of this study. We aimed to control blood glucose between 6.1-10.0 mmol/L during perioperative period. In preoperative period oral hypoglycemic agents were hold on the day before surgery and short acting insulin started. When patient was under nothing per oral (NPO) blood glucose was maintained by glucose-potassium-insulin (GKI) infusion. Perioperative blood sugar was monitored every 2 hourly to assess the hypoglycemia or hyperglycemia. Every patient were followed up for consecutive 2 weeks for emergence of postoperative complications. Data were collected by interview of patients and reviewing medical case sheet following surgery. Data regarding general medical condition of the patients, physical examination, investigation reports and their management were collected in a semi-structured questionnaire. Informed written consent was taken from the patients. Data analysis was done with the help of SPSS (Statistical package for social sciences) Version 19.0. Quantitative data were expressed as mean and standard deviation and comparison were done by *"Z"* test. Qualitative data were expressed as frequency and percentage and comparison carried by chi-square (X^2) test. Other statistical test was done whenever it is necessary. A probability value (p) of less than 0.05 was considered to indicate statistical significance.

Results

Among study cases age range was 40-70 years with diabetes mellitus where 90% were male, majority (58%) service holder. Among all participants 57% was suffering for more than 1 month. On admission, fasting blood sugar was >10 mmol/L in 96% diabetic patients (Table 1). In majority (50%) perioperative glucose was controlled by insulin and 15% controlled by

combination of all other measures (Table 2). During preoperative period 80% were maintained within <8.0 mmol/L of blood glucose level. But, in postoperative period, 12% patients became hyperglycemic (more than 10.0 mmol/L) during postoperative period in spite of tight glycemic control (Table 3). Eventually, 05 out of 06 showed delayed wound healing and 02 developed diabetic ketoacidosis who had postoperative blood glucose 12.0 to 14.0 mmol/L (Table 4).

Table I : Demographic characteristics of respondents (n = 50)

Attributes	n (%)
Age groups (years)	
40-50	10 (20.0)
51-60	25 (50.0)
60-70	15 (30.0)
Sex	
Male	45(90.0)
Female	05(10.0)
Occupation	
Service	29 (58.0)
House wife	3 (6.0)
Day Laborer	07 (14.0)
Businessman	9(18.0)
Others	02(4.0)
Religion	
Islam	47(94.0)
Hindu	03(6.0)
Monthly income	
<15000	36(72.0)
15001-30,000	10(20.0)
>30,000	04(8.0)
Duration of symptoms	
<1 month	23(46.0)
1 month -3 months	27(54.0)
Fasting blood sugar (mmol/L)	
6.1 – 8.0	0(0.0%)
8.1 – 10.0	2(4.0%)
≥ 10.0	48(96.0%)

Table II : Perioperative blood glucose management in cases (n = 50)

Attributes	n (%)
Oral hypoglycemic agents	10 (20.0)
Insulin	25 (50.0)
Combination of both	15 (30.0)
Total	50 (100)

Table III : Perioperative blood glucose status among cases (n = 50)

Variables (mmol/L)	Preoperative period	Post-operative period
	n (%)	
< 8.0	40(80.0)	20 (40.0)
8.1-10.0	10(10.0)	24 (48.0)
10.1-12.0	0	1(2.0)
12.1-14.0	0	5 (10.0)

Table IV : Postoperative outcome among hyperglycemic cases during postoperative period (n = 6)

Postoperative glucose level (mmol/l)	n (%)				*p*
	Surgical site infections (SSI)	Delayed wound healing	Diabetic ketoacidosis	No complication	
10.00 -12.00	1(16.0)	0	0	0	< 0.05
12.00 – 14.00	2*(33.34)	5*(83.34)	2*(33.34)	0	
*Multiple response					

Discussion

Blood glucose level is the most important risk factor for postoperative morbidity and mortality in case of diabetic patients. Post-surgical stress response may initiate hyperglycemia, osmotic diuresis and hypoinsulinemia leading to postoperative infections.

In present study, among 50 diabetic patients 6 developed various complications (p<.05) who had blood sugar level more than 10 mmol/L during postoperative period regardless of all control measures. Postoperative complications were

surgical site infection (n=3), delayed wound healing (n=5), diabetic ketoacidosis (n=2), surgical site infections (n=1). Majority were free from any complications as they were adjusted to blood glucose level between 8.0 to 10.0 mmol/L.

Vogel et al. studied postoperative complications of 870,778 elective vascular surgical procedures where found 3.70% overall postoperative infection rate.[24] Tang et al. found 7.2% major medical complications and 1.7% wound complications in 236 eligible cases.[25] Same types of study was found by Van den Berghe et al. where tight glycemic control to maintain blood glucose level in the lower range of 4.4 - 6.1 mmol/L improved mortality and morbidity.[26] But in another study perioperative glycemic control in the range of 8.3 – 11.1 mmol/L significantly reduced postoperative infections. Good long term glucose control is strongly associated with significantly fewer postoperative infections.[27] Though recent meta-analysis showed that tight glycemic control increase the risk of hypoglycemia.[28]

Kitara et al. found post operative complications among 76 laparotomy patients like respiratory tract infection (28.2%), wound hemorrhage (18.2%), anemia (15.5%), hypotension (14.1%), UTI (2.2%), anastomotic leak (1.4%), wound sepsis (9.9%), wound dehiscence (4.2%) and thromboembolism (1.4%).[29] On the contrary, Guckelberger et al. could not identify diabetes as an independent variable having an impact on mortality and those overall complications were equally frequent between diabetic and non-diabetic patients.[30]

Although the mechanism by which blood glucose predisposes to postoperative complications is not well understood though it proposed as a causative factor for higher infection rate in diabetic persons. So, risk factors in surgery that might contributes to morbidity and mortality are surgical site infection, hyperglycemic hyperosmolar syndrome, diabetic ketoacidosis, and surgical site infections.

Acknowledgement: The authors are grateful to all study subjects for their participation and all staff of Surgery department for their contribution in data collection.

Conflict of interest: Authors have no conflict of interest do declare. Authors did not receive any funding from anywhere for this study.

Conclusion

Proper glycemic control plays a pivotal role in preventing postoperative infections. Diabetic patients are at risk of developing various types of post-surgical complications despite of proper glycemic control. So a lower normal range could be maintained to avoid postoperative complications. And this study could help surgeons to be concern about effects of blood sugar level on postoperative infection.

References

1. Braunwald E, Isselbacher KJ, Petersdrof RG, Wilson JD, Martin JB, Fauci AS. Harrison's Principles of internal medicine.11th ed. McGraw-Hill: USA; 1987.

2. Moghissi ES, Korytkowski MT, DiNardo M et al. American Association of Clinical Endocrinologists and American Diabetes Association consensus statement on inpatient glycemic control. Diabetes Care. 2009 Jun;32(6):1119-1131.

3. Frisch A, Chandra P, Smiley D et al. Prevalence and clinical outcome of hyperglycemia in the perioperative period in noncardiac surgery. Diabetes Care. 2010 Aug;33(8):1783-1788.

4. Grimaud D, Levraut J. Acute postoperative metabolic complications of diabetes. Minerva Anestesiol. 2001 Apr;67(4):263-270.

5. Jack SD, Alberti KGMM. Management of Diabetes Mellitus in surgical patients. Diabetes Spectrum 2002 Jan;15(1):44-148.

6. American Diabetes Association; Standards of Medical Care in Diabetes - 2010. Diabetes Care. 2010; 33 (Supplement_1): S11–S61.

7. Diabetes Mellitus Controlled. America: The Prudential Insurance Company of America. 2008.

8. Brandt MR, Kehlet H, Faber O, Binder Chr. C-peptide and insulin during blockade of the hyperglycaemic response to surgery by epidural analgesia. Clin Endocrinol (Oxf). 1977;6(2):167-170.

9. Clarke RS. The hyperglycaemic response to different types of surgery and anaesthesia. Br J Anaesth. 1970 Jan;42(1):45-53.

10. Clarke RS, Johnston H, Sheridan B. The influence of anaesthesia and surgery on plasma cortisol, insulin and free fatty acids. Br J Anaesth. 1970 Apr;42(4):295-299.

11. Russell RC, Walker CJ, Bloom SR. Hyperglucagonaemia in the surgical patient. Br Med J. 1975 Jan 4;1(5948):10-12.

12. Äärimaa M, Slätis P, Haapaniemi L, Jeglinsky B. Glucose tolerance and insulin response during and after elective skeletal surgery. Ann Surg. 1974 Jun;179(6):926-929.

13. Wright PD, Henderson K, Johnston ID. Glucose utilization and insulin secretion during surgery in man. Br J Surg. 1974 Jan;61(1):5-8.

14. Lattermann R, Carli F, Wykes L, Schricker T. Perioperative glucose infusion and the catabolic response to surgery: the effect of epidural block. Anesth Analg. 2003 Feb;96(2):555-562, table of contents.

15. Schricker T, Gougeon R, Eberhart L et al. Type 2 diabetes mellitus and the catabolic response to surgery. Anesthesiology. 2005 Feb;102(2):320-326.

16. Gavin LA. Perioperative management of the diabetic patient. Endocrinol Metab Clin North Am. 1992 Jun;21(2):457-475.

17. Kennedy DJ, Butterworth JF 4th. Clinical review 57: Endocrine function during and after cardiopulmonary bypass: recent observations. J Clin Endocrinol Metab. 1994 May;78(5):997-1002.

18. Mangram AJ, Horan TC, Pearson ML et al. Guideline for prevention of surgical site infection, 1999. Hospital Infection Control Practices Advisory Committee. Infect Control Hosp Epidemiol. 1999 Apr;20(4):250-278.

19. Rosenberg CS. Wound healing in the patient with diabetes mellitus. Nurs Clin North Am. 1990 Mar;25(1):247-261.

20. Hoogwerf BJ. Postoperative management of the diabetic patient. Med Clin North Am. 2001 Sep;85(5):1213-1228.

21. Axelrod DA, Upchurch GR Jr, DeMonner S et al. Perioperative cardiovascular risk stratification of patients with diabetes who undergo elective major vascular surgery. J Vasc Surg. 2002 May;35(5):894-901.

22. Juul AB, Wetterslev J, Kofoed-Enevoldsen A et al. Diabetic Postoperative Mortality and Morbidity group. The Diabetic Postoperative Mortality and Morbidity (DIPOM) trial: rationale and design of a multicenter, randomized, placebo-controlled, clinical trial of metoprolol for patients with diabetes mellitus who are undergoing major noncardiac surgery. Am Heart J. 2004 Apr;147(4):677-683.

23. Elective surgery. Encyclopedia of surgery. http://www.surgeryencyclopedia.com/Ce-Fi/Elective-Surgery.html#ixzz2UUhfeVJ0. Accessed May 5, 2013.

24. Vogel TR, Dombrovskiy VY, Carson JL et al. Infectious complications after elective vascular surgical procedures. J Vasc Surg. 2010 Jan;51(1):122-129.

25. Tang H, Zhu J, Ji F, Wang S, Xie Y, Fei H. Risk factors for postoperative complication after spinal fusion and instrumentation in degenerative lumbar scoliosis patients. J Orthop Surg Res. 2014 Mar 7;9(1):15.

26. van den Berghe G, Wouters P et al. Intensive insulin therapy in critically ill patients. N Engl J Med. 2001 Nov 8;345(19):1359-1367.

27. Dronge AS, Perkal MF, Kancir S et al. Long-term glycemic control and postoperative infectious complications. Arch Surg. 2006 Apr;141(4):375-380.

28. Griesdale DE, de Souza RJ, van Dam RM et al. Intensive insulin therapy and mortality among critically ill patients: a meta-analysis including NICE-SUGAR study data. CMAJ. 2009 Apr 14;180(8):821-827.

29. Kitara DL, Kakande I, Mugisa BD, Obol JH. The Postoperative Complications Prediction in Mulago Hospital using POSSUM Scoring System. ECAJS. 2010; 15(2):90-96.

30. Guckelberger O, Thelen A, Benckert C et al. Diabetes mellitus is no independent risk factor for perioperative mortality following hepatic resection. Exp Clin Endocrinol Diabetes. 2006 May;114(5):257-261.

Original Article

Variaton of Distance between Sites of Division of Splenic Artery and the Hilum and Number of Branches of Splenic Artery

***Sumi MS[1], Sumi SA[2], Sultana S[3], Sultana R[4], Paul P[5], Sultana A[6]**

Abstract

Background: *Spleen, the largest lymphoid organ in the human body is closely associated with the circulatory system. Splenic arterial interventions are increasingly used to treat various medical disorders and sometimes may be substituted for surgery. For example, embolization is often performed to treat post traumatic splenic injuries and in patients with hypersplenism and those who require high-dose chemotherapy or immunosuppressive therapy to improve their hematologic parameters. So, detailed anatomical knowledge on spleen is very much important.* ***Objectives:*** *Knowledge of division of splenic artery is of great importance in surgical practice.* ***Materials and Methods:*** *This cross sectional descriptive study was done to measure distance between sites of division of splenic artery and the hilum and number of branches of splenic artery. A total 80 human spleen were collected by purposive sampling technique. The specimens were collected, from autopsy laboratory of the Department of Forensic Medicine and divided into three groups according to age.* ***Results:*** *In the present study it was found that, maximum mean distance was 1.98cm in group C, and it was observed that the distance increased with age and no significant difference was found among the age groups. It was also found that, the maximum two branches were present in group B and three branches in group C.* ***Conclusion:*** *The distance between the site of division of splenic artery and hilum increased with age. The incidence of two branches of splenic artery is more in group B and maximum three branches present in group C.*

Keywords: Spleen, Splenic artery, Bangladeshi cadaver.

Received: 30.03.2023, **Accepted:** 01.04.2023.

Ad-din Sakina Women's Medical College Journal. 2023; 4 (2) : 10-15

Introduction

The spleen is a large haemolymphoid organ consisting of vascular and lymphoid tissue which is located in the left quadrant of the abdominal cavity opposite the left ninth to eleventh ribs. Due to its rich vascularity it has friable texture. It has two surfaces (diaphragmatic and visceral), the superior and inferior borders and anterior and posterior ends or poles.[1] Splenic parenchyma consists of white and red pulp that is surrounded by serosa and a collagenous capsule with smooth muscle fibres. This parenchyma also contains dense connective tissue, rich in collagen and elastic fibres (Trabeculae). These trabeculae along with reticular framework, support the cells and surround the vessels in the splenic pulp. Spleen is an elastic, controllable reservoir that is important in adjusting the volume of the circulating blood.[2,3] During fetal development the spleen has performed important hematopoietic functions, which includes erythropoiesis and granulopoiesis. It has a distinctive pattern of blood circulation and specialized vascular channels that facilitate the filtering of blood.[4] Spleen is a spongy organ with considerable capacity of retention and excretion of blood which get supply from the splenic artery.[5] Near the splenic hilum, the artery usually divides into terminal and polar arteries. The superior terminal branches are usually longer than the inferior branches and provide the major splenic arterial supply, then enter the hilum and divide further into four or five segmental arteries that each supplies a segmental vessel often leads to

1. Dr. Mahmuda Sultana Sumi, Associate Professor, Department of anatomy, Ad-din Sakina Women's Medical College, Jashore.
2. Dr. Sharmin Akter Sumi, Assistant Professor, Department of Anatomy, BSMMU, Dhaka, Bangladesh
3. Dr. Sharmin Sultana, Associate Professor, Department of physiology, Ad-din Sakina Women's Medical College, Jashore.
4. Dr Razia Sultana, Associate professor, Department of Anatomy, Tairunnessa Memorial Medical College & Hospital, Gazipur
5. Dr. Prohelika Paul, Associate Professor (CC), Department of anatomy, Jashore Medical College, Jashore.
6. Dr. Afroza Sultana, Associate Professor, Department of anatomy, Ad-din Sakina Women's Medical College, Jashore.

***Correspondence:** E-mail: drsultanashumi@gmail.com

infarction of part of the spleen.[6] In case of diffuse type of spleen, the terminal branches are long and arise far away from the hilum. On the other hand, the compact type shows the short terminal branch, which is close to the hilum.[7] There is typically a superior polar artery, which sometimes communicates with the short gastric arteries; superior, middle, and inferior terminal arteries and an inferior polar artery. In a spleen preserving surgery, knowledge of these variable distributions of splenic artery is necessary.[8] Splenic artery aneurysm are estimated to occur at 0.04%-1% of post-mortem examinations. They are twice as common in the female and are usually situated in the main arterial trunk. Although there are usually single, but more than one aneurysm is found in a quarter of cases. They are more likely to be associated with arteriosclerosis in elderly patients. The treatment of choice is splenectomy and removal of the diseased artery. Splenic infarction commonly occurs in patients with a massively enlarged spleen from myeloproliferative syndrome, portal hypertension or vascular occlusion produced by pancreatic disease, splenic vein thrombosis or sickle cell disease. Treatment is conservative and splenectomy should be considered only when a septic infarcts cause an abscess.[2] Splenic arterial interventions also may be performed to exclude splenic artery aneurysms from the parent vessel lumen and prevent aneurysm rupture; to reduce and prevent sequelae in patients with portal hypertension.[9] Therefore, the application of conservative splenic surgery requires a detailed knowledge of vascular pattern of spleen in both sexes. In this present study, the distance between the site of division of splenic artery and hilum and the number of branches of splenic artery were studied and compared with the works of many eminent authors in this field.

Materials and Methods

The study was carried out in the department of Anatomy, Mymensingh Medical College, Mymensingh from June 2013 to July 2014. A total 80 human spleen were collected by purposive sampling technique from October 2013 to April 2014, among them 47 were male and 33 were female. The specimens were collected from Bangladeshi cadavers, from autopsy laboratory of the department of Forensic Medicine of Mymensingh medical college. Only fresh specimens from persons who died within the preceding 12 hours were chosen. After collecting, the specimen was allowed to get fixed for 48-72 hours and preserved in 10% formol-saline solution. For convenience of differentiating the number of splenic artery in relation to age and sex, the collected specimens were divided into three groups namely group A (0-20 years), group B (21-40 years) and group C (41-60 years). After removal of all fats and unwanted tissue, splenic artery was carefully preserved with its branches and the point of division of splenic artery was identified. The distance was first fixed with the help of a divider and measured with the help of a measuring scale. All data were recorded in the pre-designed data sheet, analyzed by SPSS program and compared with the findings of other national and international studies and standard text books. In statistical analysis, differences between age groups and sexes were calculated by using one way ANOVA test and unpaired Student's t test accordingly.

Results

From Table-I(a) and I(b) it was evident that the maximum distance between sites of division of splenic artery and the hilum in group A (0-20 years) was 3.00 cm, in group B (21-40 years) 4.00 cm and 5.00 cm in group C (41-60 years). The minimum distance from the hilum in group A was 0.50 cm, in group B 0.50 cm and 0.80 cm in group C. The mean distance was maximum in group B, 2.26 cm in male and in group C 2.06 cm in female and

minimum in group A, 1.49 cm in male and 1.56 cm in female. It was also observed that the mean distance from the hilum was gradually increased with age.

Table: I(a) Mean distance between sites of division of splenic artery and the hilum in different age groups

Age Group	Number of specimen	Distance between sites of division of splenic artery and the hilum in cm Mean ± SD (Minimum – Maximum)
A (0-20 years)	28	1.51±0.62 (0.50- 3.00)
B (21 – 40 years)	31	1.92±0.77 (0.50- 4.00)
C (41 to 60 years)	21	1.98±0.91 (0.80- 5.00)

Table: I(b) Comparison of distance between sites of division of splenic artery and the hilum among the age groups:

Comparison between Variables	Mean Difference in cm	Std. Error	*P*	Level of significance
Group A vs Group B	0.36	0.26	0.192	NS
Group B vs Group C	0.90	0.43	0.07	NS
Group C vs Group A	0.54	0.4	0.232	NS

Comparison between 3 groups were done by ANOVA test. *P* value > 0.05, not significant at 5% confidence interval (CI) level. NS; not significant.

The mean distance between group A & B, group B & C, group C & A was statistically not significant as *p*> .05.

Table- II(a), II(b) and figure 1 depicts that the mean (±SD) distance between sites of division of splenic artery and the hilum was higher in male (1.49±0.48) cm in Group A and (2.26±0.82) cm in group B than that of female (1.56±0.84) cm and (1.67±0.64) cm in Group A and B respectively, but lower in Group C (1.96±1.02) cm where mean distance was (2.06±0.44) cm in Group C.

Table: II(a) Mean distance between sites of division of splenic artery and the hilum in different sex groups

Age Group	Sex of the person	Number of specimen	Mean distance between sites of division of splenic artery and the hilum in cm ± SD
A (0-20 years)	Male	18	1.49±0.48
	Female	10	1.56±0.84
B (21 – 40 years)	Male	13	2.26±0.82
	Female	18	1.67±0.64
C (41to 60 years)	Male	16	1.96±1.02
	Female	5	2.06±0.44

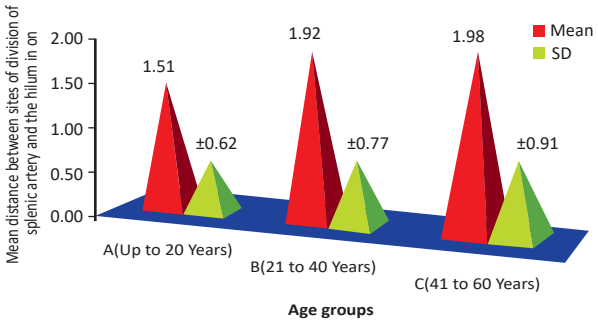
Table: II(b) Comparison of distance between sites of division of splenic artery and the hilum between sexes:

Age group	Mean Difference between sex	Std. Error Difference	t	*p*	Level of significance
A	0.74	0.297	2.488	0.055	NS
B	0.875	0.210	4.162	0.004	S
C	0.95	1.299	0.731	0.598	NS

Comparison between sex was done by variance analysis. *P* value > 0.05, not significant at 5% confidence interval (CI) level. NS; not significant. S; significant.

Variance analysis shows highly significant difference in between group B & C, where for Group B t= -4.162 and *p*=0.004.

Figure 1: Bar diagram representing the mean distance between sites of division of splenic artery and the hilum of spleen in different age groups.



From table III(a) and III(b) it was evident that, about 88.75% of cases the splenic artery divides into superior and inferior terminal branches and in 11.25% of cases the artery divides into superior, middle and inferior terminal branches. It was also found that, the maximum two branches present in group B, which was 90.32% and maximum three branches present in group C, which was 14.28%.

Table: III (a): Number of branches of splenic artery in different age groups

Age Group	Specimen number	Two branches	Three branches
A (0-20 years)	28	25 (89.28%)	3 (10.71%)
B (21-40 years)	31	28 (90.32%)	3 (9.67%)
C (41-60 years)	21	18 (85.71%)	3 (14.28%)
Total	80	88.75%	11.25%

Table: III (b): Comparison of number of branches of splenic artery among the age groups:

Comparison between Variables	Mean Difference in cm	Std. Error	*p*	Level of significance
Group A vs Group B	0.11	0.13	0.396	NS
Group B vs Group C	0.67	0.20	0.01	S
Group C vs Group A	0.56	0.26	0.061	NS

Comparison between 3 groups were done by ANOVA test. *P* value > 0.05, not significant at 5% confidence interval (CI) level. NS; not significant. S; Significant.

The mean values were not significant between group A & B, C & A at $p > .05$ level but statistically significant in group B & C at $p < .05$ level.

Discussion:

From the present study it was evident that, the maximum distance between sites of division of splenic artery and the hilum in group A was 3.00 cm, in group B 4.00 cm and 5.00 cm in group C. The minimum distance from the hilum in group A was 0.50 cm, in group B 0.50 cm and 0.80 cm in group C.

It was also observed that the mean distance was maximum 1.98 cm in Group C and minimum 1.51 cm in Group A. The mean distance between group A & B, group B & C, group C & A was statistically similar. In this study the mean value of the distance between sites of division of splenic artery and the hilum was higher in male than that of female in Group A and group B but lower in Group C. Variance analysis shows highly significant difference in between group B & C and no significant difference between other groups.

In 2008 Chawdhury studied 120 spleens of Bangladeshi cadaver and found that the average maxi-

mum distance from the hilum was 2.67 cm in male and 3.00 cm in female of above 60 years age group. The minimum distance from the hilum was 2.07 cm in male and 1.52 cm in female of upto 15 years age group, which supports the mean distance between sites of division of splenic artery and the hilum of present study.[10] The mean distance of present study in different age group was higher than Rayhan (2006), who studied 70 spleens and found, the maximum mean distance as 3.50 cm in above 60 years age group and minimum as 3.10 cm in 0-19 years age group.[11] The present study shows, splenic artery in group A divided into its terminal branches in group A 0.5- 3.00 cm, in group B 0.5-4.00 cm and in group C 0.8-5.00 cm away from the hilum, which was supported by another study who found that, splenic artery divided into its terminal branches 2-4 cm proximal to the hilum of the spleen.[12] Holivkova et al in 1998 observed that the splenic artery divides into its terminal branches approximately 2-12.2 cm from the hilus, which was higher than the findings of present study.[13]

In the present study it was found that, in 88.75% cases the splenic artery divided into superior and inferior terminal branches and in 11.25% cases splenic artery divided into superior, middle and inferior terminal branches.

Coetzee in his study observed that about 80% of cases the splenic artery divided into superior and inferior terminal branches and in 20% of cases in superior, middle and inferior terminal branches.[14] In other study stated that the splenic artery divided into two or three main branches before entering the hilum of the spleen.[6] In another study it showed that the main splenic artery generally divided into superior and inferior branches.[2] In different study it was found that two lobar arteries were present in 63.3% samples; three lobar arteries were present in 36.7% samples.[15] In the present study incidence of two branches of splenic artery was more and incidence of three branches was less than the findings of above mentioned authors.

Conclusion

From the present study, it was concluded that the splenic artery was divided nearer to hilum in early age group and distance between sites of division of splenic artery and the hilum increased with age. The maximum two branches of splenic artery are present in group B and three branches in group C.

References

1. Kulkarni NV. Clinical Anatomy. 2nd ed. New Delhi: Jaypee brothers medical publishers (p). 2012;700–703.

2. Williams NS, Bullstrode CJK, O'Connell PR. Bailey & Love's Short Practice of Surgery. 25th ed. Ann R Coll Surg Engl [Internet]. 2010;92(2):178 –178.

3. Arey LB. Human histology. 4th ed. Philadelphia: WB Saunders; 1974;152-157.

4. Krause WJ, Cults JH. Essential of Histology Text/ Atlas/ Review. 1st ed. London: Little, Brown and Company. 1994;369–374.

5. Ortiz PP, Díaz P, Daniel-Lamazière JM, et al. Morphometry of the human splenic artery: muscular columns, morphofunctional aspects and developmental implications. Histol Histopathol. 1998;13(2):315-324.

6. tandring, S. Gray's Anatomy, The Anatomical Basis of Clinical Practice. 42nd ed. Elsevier, Amsterdam. 2020;1232-1238.

7. Singh, V. Textbook of Anatomy: Abdomen and Lower Limb. 3rd ed. Elsevier. 2020;(2):98-103.

8. David S, Townsend CM. Sabiston Textbook of Surgery : The Biological Basis of Modern Surgical Practice. 19th ed. Elsevier Saunders. 2012.

9. Madoff DC, Denys A, Wallace MJ et al. Splenic arterial interventions: anatomy, indications, tech-

nical considerations, and potential complications. Radiographics. 2005 Oct;25 Suppl 1:S191-211.

10. Chawdhury AI. Gross and Histological study of spleen in Bangladeshi people [Unpublished M.Phil thesis]. Mymensingh Medical College;2008.

11. Rayhan KA. Postmortem study of human spleen and splenic artery of Bangladeshi people in different age groups [Unpublished M.Phil thesis].Dhaka University;2006.

12. Daisy Sahni A, Indar Jit B, Gupta CN et al. Branches of the splenic artery and splenic arterial segments. Clin Anat. 2003 Sep;16(5):371-377.

13. Holibková A, Machálek L, Houserková D et al. A contribution to the types of branching and anastomoses of the splenic artery in human spleen. Acta Univ Palacki Olomuc Fac Med. 1998;141:49-52.

14. Coetzee T. Clinical anatomy and physiology of the spleen. S Afr Med J. 1982;61(20):737–746.

15. Alim A, Nurunnabi ASM, Ara S, Mahbub S, Mohanta LC. Comparative Histological Study on the Spleen of Human (Homo sapiens), Cow (Bos indicus) and Goat (Capra hircus). Nepal J Med Sci. 2012;1(2):64–67.

Original Article

Smoking Habits among the Jute Mill Workers in Bangladesh.

***Sultana R[1], Akhter H[2], Salim A[3], Chowdhury T[4]**

Abstract

Background: *The habit of tobacco smoking has spread throughout the world and as a major source of morbidity and mortality, is a serious public health problem. Tobacco smoking reduces life expectancy, increases overall medical costs and contributes to loss of productivity during the lifespan of an individual.* ***Objective:*** *To determine the socio-demographic characteristics and association of the smoking habits with sex of the Jute Mill workers.* ***Materials and Methods:*** *The study design was a cross-sectional and conducted in the Sadat Jute Mill, Comilla, Bangladesh from October 2019 to December 2019. A total of two hundred and fifty six (256) male and female workers were included in the study and data were collected by using a pre-tested, semi- structured questionnaire.* ***Results:*** *The mean age of the respondents were 35.77 ± 10.61 years, 80.62% were male, 19.38% were female. 8.5% were illiterate, 40.7% were educated up to primary level, 40.3% were up to SSC level and the remaining 14% were up to HSC and above. More than half (58.1%) of the workers had monthly income of TK 5000 to 10,000 followed by 27.5% less than TK 5000 per month, only 14.4% of the respondents have earned more than TK 10,000 per month. A positive association was found between the sexes of the respondents with the smoking habits among the jute mill workers.* ***Conclusion:*** *The prevalence of smoking reflects the magnitude of the problem and determines its importance, since it provides a basis for the planning of public health actions. Findings obtained from this study also suggested valuable insight regarding strengthening implementation of tobacco control policy of Bangladesh.*

Keywords: Smoking habits, Jute mill workers.

Received: 02.04.2023, **Accepted:** 06.04.2023.

Ad-din Sakina Women's Medical College Journal. 2023; 4 (2) : 16-20

Introduction

The habit of tobacco smoking has spread throughout the world and, as a major source of morbidity and mortality, is a serious public health problem.[1–6] Despite numerous efforts to reduce its prevalence, which have enabled an estimated reduction in global prevalence from 25.7% in 2000 to 19.8% in 2015, the tobacco smoking projected prevalence estimated in 2025 will still stand at 17.1%, with significantly higher estimates (24.0%) in Europe. In terms of sex, there is a 3:2 ratio in Europe, compared to 2:1 in the U.S. In other countries, there is an apparent prevalence of tobacco product use in men.[7] Smoking will cost 60 million of life lost within the next 20 years; according to World Health Organization, tobacco smoking is the first leading risk factor causing early death and disability in males.[8]

The list of diseases caused by smoking includes chronic obstructive pulmonary disease, coronary heart disease, stroke, abdominal aortic aneurysm, acute myeloid leukemia, cataract, pneumonia, periodontitis, and bladder, esophageal, laryngeal, lung, oral, throat, cervical, kidney, stomach, and pancreatic cancers.[9] Cigarette smoke contains over 4,800 chemicals, 69 of which are known to cause cancer. Smoking is directly responsible for approximately 90 percent of lung cancer deaths and approximately 80-90 percent of COPD deaths.[10] Among current smokers, chronic lung disease accounts for 73 percent of smoking-related conditions. Even among smokers who have quit smoking, chronic lung disease accounts for 50 percent of smoking-related conditions.[11] Bangladesh is one of the top ten countries in the world with high current smoking prevalence of 44.7% among men.[12]

1. Dr. Rehana Sultana, Associate professor, Dept. of Community Medicine, Eastern Medical College, Comilla, Bangladesh.
2. Dr. Hosneara Akhter, Assistant professor, Dept. of Community Medicine, Shahabuddin Medical College, Dhaka, Bangladesh.
3. Dr. Airin Salim, Associate Professor, Dept. of Community Medicine, Eastern Medical College, Cumilla, Bangladesh.
4. Dr.Tasmina Chowdhury, Ex-Lecturer, Dept. of Community Medicine, Shahabuddin Medical College, Dhaka, Bangladesh.

***Correspondence:** E-mail : rehanahossain189@gmail.co

A previous epidemiological study conducted in 2004 showed that smoking was responsible for approximately 57000 deaths and 1.2 million tobacco related illnesses per year in Bangladesh; 16% of all deaths among those of age 30 years and older were attributed to tobacco use.[13] A more recent study conducted using 2010 data concluded that about 25% of all deaths among men aged 25 to 69 years are attributable to smoking leading to average loss of 7 years of life per smoker.[14]
Bangladesh is also one of the largest jute producing country. More than 1.5 million workers are employed in 11,983 presently functioning looms of jute industries in Bangladesh. It is estimated that 307 jute mills (government /non-government: 26 /281) have been producing jute goods. The jute products are exported to India, Syria, Tunisia, Turkey, Iraq, Thailand and other countries. The daily average wage of jute-mill workers (JMW) has been reported as BDT ~308.00 (approximately USD 3.6).[15] The health status of the low paid JMW remained unknown. In Bangladesh, no study has been so far conducted to assess the smoking habits among the jute mill workers. So this study has been conducted with the aim to find out the association between the sex and smoking habits among the jute mill workers in Bangladesh.

Materials and Methods

This study was a descriptive type of cross sectional study conducted among JMW of Sadat Jute Mill, Comilla from October 2019 to December 2019. After written and informed consent, a total of 258 voluntarily agreed adult male and female JMW participated in this study. A pre-tested, semi-structured questionnaire was used for data collection by face to face interview. All statistical analysis was performed by SPSS and Microsoft excel. Chi-square test was done to see the relationship and statistical significance of the dependent and independent variables. JMW who had been working for more than 6 months and willing to participate in the study were included and JMW who were mentally ill and not willing to participate in the study were excluded.

Results

Table I: Age group of the respondents.

Age group	Frequency	Percentage
Up to 20 years	19	7.4
20 to 30 years	83	32.2
30 to 40 years	93	36.0
40 to 50 years	48	18.6
>50 years	15	5.8
Total	**258**	**100.0**

Table I revealed that out of the 258 participants 36% were from 30-40 years age group followed by 32.2% were from 20-30 years age group, 18.6% were from 40-50 years age group, only 7.4% were less than 20 years and 5.8% were from more than 50 years of age group.

Table II: Monthly income of the respondents.

Income in Tk	Frequency	Percentage
Within Tk 5000	71	27.5
Tk 5000 to 10000	150	58.1
Tk 10000 to 20000	34	13.2
Tk > 20000	3	1.2
Total	**258**	**100.0**

Table 2 explained that more than half (58.1%) of the workers had a monthly income of Tk 5000-10,000/- followed by 27.5% had an income of less than Tk 5000/- per month, only 14.4% of the respondents had earned more than 10000/- per month.

Table III: Smoking habit of the respondents.

Smoking	Frequency	Percentage
Yes	65	25.2
No	193	74.8
Total	**258**	**100.0**

It was revealed from the table 3 that out of 258 respondents 74.8% were nonsmoker and remaining 25.2% were found smoker.

Figure 1: Distribution of Sex among the respondents.

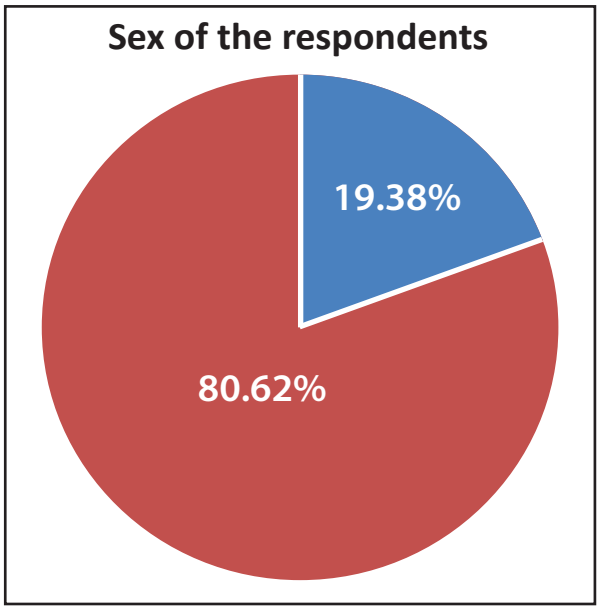


Figure 1 represents that about 80.62% of the respondents were male and the remaining 19.38% were female.

Table IV: SRelationship between sex of the respondents and smoking habits of the respondents.

Sex	Smoking habits of the respondents		Total (%)	x^2 test	*p* value
	Yes	No			
Male	65 (31.2%)	143(68.8%)	208(100.0%)	277.63	< 0.001
Female	0	50(100.0%)	50(100.0%)		
total	65(25.2%)	193(74.8%)	258 (100%)		

Table 4 represents that out of the total 208 male respondents about 143 (68.8%) were non-smokers and only 65 (31.2%) were reported smoking. Among the female respondents no one reported smoking. The smoking habits of the respondents were statistically significant with the sex of the respondents. ($p < 0.001$)

Discussion

Smoking and passive smoking are collectively the biggest preventable cause of death in Bangladesh, with major public health burden of morbidity, disability, mortality and community costs.[12,13] An earlier epidemiological study conducted in 2004 showed that smoking was responsible for approximately 5000 deaths and 1.2 million tobacco related illnesses per year in Bangladesh; 16% of all deaths among those of age 30 years and older were attributed to tobacco use.[12]

The study was aimed to evaluate the smoking habits of the JMW. In our study most of the respondents were from age group 30- 40 years, where in a similar type of study most of the respondents were from 18-25 years.[16]

In the current study it was found that most of the workers (58.1%) had monthly income of Tk. 5000-10,000 which is similar to another study done in Dhaka city among the garments workers.[16] The prevalence of smoking habits among the mill workers were 25.2% which was less than the national data obtained from Global Adult Tobacco Survey (GATS) in 2009 (43.3%).[17] Similar study was done among the garments worker in Dhaka city where it was found that overall tobacco consumption was 14.1 percent among the garments workers which was less than the findings of our study16. Another study conducted by Zakir Anwar Ansari showed prevalence of tobacco use was 85.9% which was much higher than the findings of the current study.[18]

The study shows that the smoking habit of the respondents were statistically significant with the sex of the respondents ($p<0.001$). A similar type of

study showed that the prevalence of tobacco use is generally higher among men than women, which supports the findings of our study.[19]

Limitation of the study

The study was conducted in a single jute mill, so the findings cannot be applied to all jute mill workers of our country. Since the study design was cross sectional, it referenced only a single point in time.

Conclusion

In our culture, smoking is an acceptable behavior for adults. So, smoking behavior cannot be controlled only increasing level of knowledge related to health hazards of smoking. Warning message and text might have little impact on reducing smoking behavior than socio-cultural and regulatory intervention. The prevalence of smoking reflects the magnitude of the problem, and determining it is important since it provides a basis for the planning of public health actions. Findings obtained from this study also suggested valuable insight regarding strengthening implementation of tobacco control policy of Bangladesh. Besides knowledge and attitudes towards tobacco, it revealed some socio-cultural aspects which have a valuable base for controlling tobacco consumption practice among jute mill workers. In addition, more focused qualitative study is needed in this purpose.

Recommendations

1. Programs need to be established to disseminate the correct and appropriate information about the health consequences of smoking to educate the jute mill workers.
2. Regular surveys should be done to monitor the situation and the effectiveness of preventive programs.
3. Assist the work of social workers and other health promotion workers in their work in the smoker's advices to quit smoking.
4. In addition, the media can assist by disseminating the message of quitting smoking to the Jute Mill workers.
5. We recommend that the factors identified in this study should be taken into consideration in antismoking programs to make them more effective and better able to influence the attitudes and behaviors of smokers.
6. Law enforcers should be more sensible regarding their own tobacco using practice and should be more active for implementing tobacco control policy.

References

1. Wald NJ, Hackshaw AK. Cigarette smoking: an epidemiological overview. Br Med Bull. 1996 Jan;52(1):3-11. doi: 10.1093/oxfordjournals.bmb.a011530. PMID: 8746292.
2. Illing EM, Kaiserman MJ. Mortality attributable to tobacco use in Canada and its regions, 1991. Can J Public Health. 1995 Jul-Aug;86(4):257-265. PMID: 7497413.
3. Giovino GA, Henningfield JE, Tomar SL et al. Epidemiology of tobacco use and dependence. Epidemiol Rev. 1995;17(1):48-65. doi: 10.1093/oxfordjournals.epirev.a036185. PMID: 8521946.
4. Louie D. The effects of cigarette smoking on cardiopulmonary function and exercise tolerance in teenagers. Can Respir J. 2001 Jul-Aug; 8(4):289-291. doi: 10.1155/2001/701384. PMID: 11565515.
5. Fielding JE. Smoking: health effects and control (1). N Engl J Med. 1985 Aug 22;313(8):491-498. doi: 10.1056/NEJM198508223130807. PMID: 3894970.
6. Cresanta JL. Epidemiology of cancer in the United States. Prim Care. 1992 Sep;19(3):419-441. PMID: 1410056.
7. WHO global report on trends in prevalence of

tobacco use 2000–2025, third edition. Geneva: World Health Organization; 2019.
8. Institute for Health Metrics and Evaluation (IHME). Findings from the Global Burden of Disease Study 2017; IHME: Seattle, WA, USA, 2018. Available at: https://www.healthdata.org/sites/default/files/files/policy_report/2019/GBD_2017_Booklet.pdf
9. Office of the Surgeon General (US); Office on Smoking and Health (US). The Health Consequences of Smoking: A Report of the Surgeon General. Atlanta (GA): Centers for Disease Control and Prevention (US); 2004. PMID: 20669512.
10. Centers for Disease Control and Prevention. National Center for Chronic Disease Prevention and Health Promotion. Tobacco Information and Prevention Source (TIPS). Tobacco Use in the United States. January 27, 2004.
11. Internet Citation: Treating Tobacco Use and Dependence: 2008 Update. Content last reviewed February 2020. Agency for Healthcare Research and Quality, Rockville, MD. https://www.ahrq.gov/prevention/guidelines/tobacco/index.html
12. Global adult tobacco survey 2009. Bangladesh, 2009. World Health Organization; 2009. Available at: https://extranet. who.int/ncdsmicrodata/index.php/catalog/259
13. Impact of Tobacco-related Illnesses in Bangladesh. New Delhi: World Health Organization. Regional Office for South-East Asia. New Delhi;2007. https://www.researchgate.net/publication/274732189_Impact_of_tobacco_related_ illnesses_in_Bangladesh
14. Alam DS, Jha P, Ramasundarahettige C et al.. Smoking-attributable mortality in Bangladesh: proportional mortality study. Bull World Health Organ. 2013 Oct 1;91(10):757-764. doi: 10.2471/BLT.13.120196. Epub 2013 Jul 12. PMID: 24115799; PMCID: PMC3791659.
15. Bangladesh Bureau of Statistics (BBS) Statistics and Informatics Division (SID) Ministry of Planning. www.bbs.gov.bd.
16. Islam Khan, M. A., Islam Khan, M., Jahan, I., Alam Sarker, M. J., Islam, S. M. S., Ar Rashid, H., Muraduzzaman, S. M., & Ahmed, M. R. KAP Study of Tobacco Users among the Garment Workers at Dhaka City in Bangladesh. Journal of Advances in Medicine and Medical Research. 2019;30(10): 1–12.
17. Preliminary Report on GATS Bangladesh 2017. An Online International Journal.
18. Ansari ZA, Bano SN, Zulkifle M. Prevalence of tobacco use among power loom workers – a cross-sectional study. Indian J Community Med. 2010 Jan;35(1):34-39. doi: 10.4103/0970-0218.62551. PMID: 20606917; PMCID: PMC2888365.
19. Nargis N, Thompson ME, Fong GT et al. Prevalence and Patterns of Tobacco Use in Bangladesh from 2009 to 2012: Evidence from International Tobacco Control (ITC) Study. PLoS ONE. 2015; 10(11).

Original Article

The Functional Outcome of Internal Fixation by Anterior Pelvic Plating & Posterior Percutaneous Iliosacral Screw in Tile Type-C Pelvic Ring Fracture.

***Rahman MA[1], Islam A[2], Eskander SMF[3], Rahman SA[4], Nahar S[5]**

Abstract

Background: *Pelvic fractures constitute one of the most severe orthopedic injuries causing significant mortality & morbidity. Unstable pelvic ring disruptions result from high-energy trauma and are associated with multiple concomitant injuries. Effective emergency medical services & proper definitive management must be ensured to save lives & reduce long-term complications.* ***Objectives:*** *To evaluate the functional outcome of internal fixation by anterior pelvic plating & posterior percutaneous iliosacral screw in Tile Type-C pelvic ring fracture.* ***Materials and Methods:*** *This prospective interventional study was conducted at the Department of Orthopedic Surgery, Dhaka Medical College & Hospital, Dhaka, for two years from July 2019 to June 2021. Patients of diagnosed Tile Type-C pelvic ring fractures were the study population. A total of 22 patients aged 18 to 60 years presenting within three weeks of injury were included in the study. Functional outcomes were evaluated six months after surgery according to Majeed Score.* ***Results:*** *According to Majeed score grading, the overall functional outcome of the study population revealed that 18 patients (81.82%) belonged to satisfactory (excellent + good), and four patients (18.18%) belonged to unsatisfactory (poor + fair) outcomes. Only 02 patients (9.09%) had wound infection, 02 patients (9.09%) had erectile dysfunction, 02 patients (9.09%) had urinary tract infection, 01 patient (4.55%) had implant loosening & 14 patients (63.63%) had no postoperative complications.* ***Conclusion and Recommendations:*** *Internal fixation of Tile Type - C pelvic ring fractures by anterior pelvic plating and posterior per-cutaneous iliosacral screw are a satisfactory and effective management method for early mobilization and rehabilitation of the patients.*

Keywords: Internal fixation, Anterior pelvic plating, Posterior percutaneous iliosacral screw, Type-C pelvic ring fracture.

Received: 06.04.2023, **Accepted:** 08.04.2023.

Ad-din Sakina Women's Medical College Journal. 2023; 4 (2) : 21-28

Introduction

Traumatic disruption of the pelvic ring has become a major focus of orthopedic interest in the past two decades. Pelvic fractures constitute about 1.5% to 3% of all skeletal injuries. Hossain et al. (2020) showed that bus accident was the commonest cause of fracture pelvis in Bangladesh due to sub-optimal roads, speeding, overtaking, reckless driving, unfit vehicles, and the violence of traffic rules/signs.[1] This injury forms part of the spectrum of polytrauma. The initial treatment of unstable pelvic ring injuries consists of bleeding management, hemodynamic restoration, stabilization of the pelvic ring, and a quick and accurate diagnosis and surgery. As a damage control procedure, patients are initially stabilized with an external fixator for temporary pelvic stabilization. When the patient's hemodynamic state is stabilized, definitive internal fixation surgery is performed, usually in 5 to 7 days.[20] Black et al. (2016) reported decreasing mortality rates over 13 years after initiating a multidisciplinary institutional protocol.[4] All patients with open pelvic fractures were managed according to the standard Advanced Trauma Life Support (ATLS) protocol, and antibiotics & anti-tetanus protocol were injected appropriately. Management course was different for each patient depending on his/her hemodynamic status.[2] Spanjersberg et al. (2009) showed that pelvic circumferential compression devices were effective in stabilizing unstable pelvic

1. Dr. Md. Ashiqur Rahman, Assistant Professor, Department of Orthopedic Surgery, Ad-din Sakina Women's Medical College Hospital, Jashore, Bangladesh.
2. Prof. Dr. Saidul Islam, Professor (Ex), Department of Orthopedic Surgery, Dhaka Medical College Hospital, Dhaka, Bangladesh.
3. Dr. Shah Md Faisal Eskander, Consultant Orthopedic Surgeon, MOHFW.
4. Dr. Sheikh Anisur Rahman, Senior Consultant, Orthopedic Surgery, Upazilla Health Complex, Kapasia, Gazipur.
5. Dr. Shamsun Nahar, Assistant Professor, Department of Surgery, Ad-din Sakina Women's Medical College Hospital, Jashore, Bangladesh.

***Correspondence:** E-mail: ashiqrahman.hf10@gmail.com

fractures.[3] Circumferential devices can be achieved by using a specially designed commercial device. Mortality was estimated at 28% from multiple pooled studies but can be as high as 50% in open fractures. In a multicenter retrospective review of 2551 patients with pelvic ring injuries, mortalities were closely associated with a concomitant soft tissue injury.[21] Patients with unstable pelvic ring injuries and associated hemodynamic instability or open fractures require immediate and aggressive surgical care. However, controversies remain concerning the choice and the sequence of the life-saving surgical procedure required. Schematically, four procedures are available to control pelvic bleeding in severely hypotensive patients acutely: immediate skeletal external fixator, direct vessel ligation, angiographic embolization (which may control high-pressure arterial bleeding) and retroperitoneal pelvic packing to help control both high-pressure as well as low-pressure bleeding.[5] Over the past decades, a "two hits" model of systemic inflammatory response in critically injured patients has been described. The initial trauma acted as the first hit that leads to the initiation of an immune-inflammatory response, with potential interventions done during this period, such as surgical interventions being potential "Second hits," driving a patient towards a more systemic inflammatory response characterized by organ dysfunction and is a cause for later morbidity & mortality following acute trauma.[8] An unstable pelvic fracture may be life-threatening and can be seen as "The Killing" fracture.[7] If the ring is broken in one area and the fragments are displaced, there must be a fracture or dislocation in another part of the ring. The stability of the pelvic ring depends upon the integrity of the posterior weight-bearing sacroiliac complex, with the major sacroiliac, sacrotuberous, and sacrospinous ligaments. The extremely strong posterior sacroiliac ligament maintains the normal position of the sacrum in the pelvic ring, and the entire complex has the appearance of a suspension bridge. The lesion in the anterior part of the ring is less critical in the stability of a pelvic ring that is intact posteriorly.[10] Various surgical options for anterior ring fixation include an external fixator, retrograde retropubic screw, and plate. The most commonly used surgical approach is a pfannenstiel-type incision for symphyseal disruption and medial ramus fracture. For the plate fixation of the displaced lateral ramus fracture & anterior column, an ilioinguinal approach is widely used as the exposure of choice, which may require a long operation time, meticulous handling around the neurovascular bundle, and significant blood loss. Based on the current concept of minimally invasive surgery that emphasizes less tissue dissection, the modified stoop approach has been introduced to treat pelvic-acetabular fractures, allowing easy exposure of the pelvic brim, where bone quality is optimal for screw fixation.[8] Biomechanical studies showed that the best stability in type - C pelvic ring fractures can be achieved by internal fixation of the posterior and anterior pelvic injuries.[22] Unstable pelvic ring injuries are frequently associated with various types of combined injuries. The conservative treatment of these injuries had been disappointing. Early rigid fixation and anatomical reduction of the pelvic ring are recommended to reduce mortality and allow early ambulation. The complicated vertical shear type of injury, an unstable lateral compression injury, or external rotation instability requires anatomical reduction, anteriorly and posteriorly. Displaced unstable pelvic ring injuries are commonly associated with the disrupted osteoarticular junction of the sacroiliac joint. Plating or sacral bars are widely used for posterior lesions, but they need wide exposure, which may be susceptible to infection & post-operative complications. Given these problems, the percutaneous iliosacral screw fixation is a far less invasive technique than those of previous options and sacral fractures commonly

encountered in unstable pelvic ring injuries.[13] Reduction of a hemipelvis involves a combination of traction and rotation to correct the deformity. For unstable pelvic ring injury, the anterior ring is fixed with a plate, and posterior fixation is aided by an accurate definition of the injury pattern using preoperative traction, early surgical treatment, and identification of posterior sacral foramina, which are used as a guide to allow accurate screw placement into the Sacrum. The technique risked damage to the L5 and S1 nerve roots and iliac vessels anterior to the body of the sacrum and the sacral nerve roots within the vertebral canal, and it requires excellent radiographic technique and a thorough understanding of the three-dimensional anatomy of the pelvis. In unstable pelvic ring injuries, good results were also reported with percutaneous iliosacral screw fixation.[14] The purpose of the study is to evaluate the functional outcome of the patients treated with anterior pelvic plating & posterior percutaneous iliosacral screw fixation in Tile Type-C pelvic ring fracture.

Materials and Methods

This prospective interventional study was conducted at the Department of Orthopedic surgery, Dhaka Medical College & Hospital, Dhaka, for two years from July 2019 to June 2021. Patients of diagnosed unilateral or bilateral Tile Type-C pelvic ring fractures were the study population. A total of 22 patients aged 18 to 60 years presenting within three weeks of injury were included in the study. Functional outcome were evaluated six months after surgery according to Majeed Score. Data included demography of the patients, mechanism of injuries, associated injuries, emergency interventions, fracture types, post-operative complications & length of hospital stay. Morbidly obese patients, patients with acetabular fracture, complete spinal injury, dysmorphic sacrum and patients who lost follow up were excluded from the study.

Before the commencement of the study, the protocol was approved by a research review committee of the department of Orthopedic surgery, DMCH. The ethical clearance was obtained from the ethical review committee of DMCH. After written and valid consent from all voluntarily agreed participants data were collected with a pre-tested structured questionnaire containing history, clinical examination, laboratory investigations, pre-operative, per-operative, and post-operative follow-up findings, and complications. Collected data were analyzed using the software SPSS (Statistical Package for Social Sciences) version 23.0 for windows. Descriptive statistics were used to analyze the data. Analyzed data were presented in tables and charts with appropriate interpretations.

Results

Table 1 shows the distribution of patients by age. In this study, the highest number of patients, 08(36.36%), were observed in the third decade, and the lowest number, 01(4.55%), was observed in the second decade. The mean age was 37.82±14.82 years, ranging from 18 to 60 years. Among 22 patients, 18(81.82%) were male, and 04(18.18%) were female (Figure 1). Maximum patients 10(45.45%) had right side injury, 07(31.82%) had bilateral injury & 05(22.73%) had left side involvement (Table 2). In this series out of 22 patients 8(36.36%) were worker, 6(27.27%) service holder, 4(18.18%) student, 2(9.09%) businessman and 2(9.09%) driver (Figure 2). Regarding the associated injury, it was observed that 01(4.55%) patient had an associated open fracture shaft of tibia-fibula, 01(4.55%) patient had fracture patella, 01(4.55%) patient had

fracture calcaneum, 01(4.55%) patient had fracture shaft of fibula, 01(4.55%) patient had fracture distal radius, 04(18.18%) patient had urethral injury, 02(9.09%) patient had a neurological injury, 01(4.55%) patient had Morel-Lavallee lesion, 01(4.55%) patient had chest injury, and 08(36.36%) patient had no associated injury (Table 3). The mean duration of hospital stay was 24.09±10.14 days, with a range from 14 to 64 days. Moreover, most patients stay at the hospital for 21 to 30 days (Table 4). The functional outcome revealed that 18 patients (81.82%) belonged to satisfactory & 04 patients (18.18%) belonged to unsatisfactory (Figure 3).

Table I: Demographic information of study population (N=22).

Characteristic	Frequency	Percentage
Age (in years)		
18-20	1	4.55
21-30	8	36.36
31-40	6	27.27
41-50	3	13.64
51-60	4	18.18
Total	22	100
Mean±SD	37.82±14.82	
Range	(18 – 60)	
Gender		
Male	18	81.82
Female	4	18.18
Occupational s tatus		
Worker	8	36.36
Service Holder	6	27.27
Student	5	22.73
Businessman	2	9.09
Driver	2	9.09

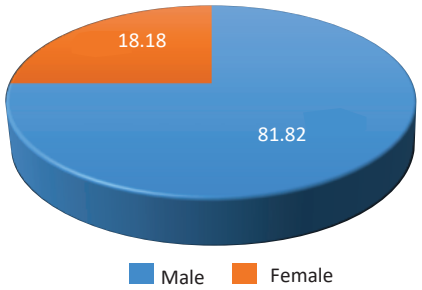


Figure 1 : Pie chart showing the distribution of the patients by gender.

Table II: Mode of injury of the study population (N=22).

Characteristic	Frequency	Percentage
Mode of injury		
Bus accident	6	27.27
Motorcycle accident	5	22.73
Car accident	3	13.64
CNG has driven 3 wheeler	3	13.64
Fall from a height of more than 12 feet	2	9.09
Truck accident	2	9.09
Fall of a heavy object	1	4.55
Side of Injury		
Right	10	45.45
Left	5	22.73
Bilateral	7	31.82

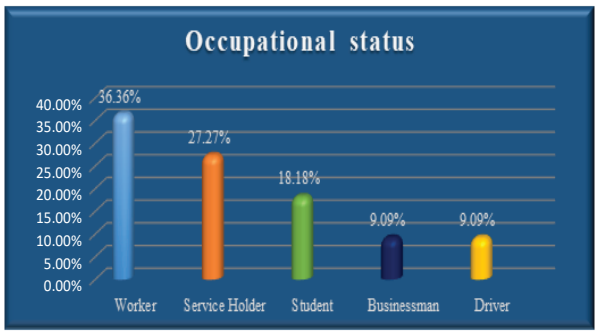


Figure 2 : Bar diagram showing the distribution of the patients by occupational status.

Table III: Distribution of patients according to associated injuries (n=22).

Associated injury	Frequency	Percentage
Orthopedic injury		
Open fracture shaft of tibia-fibula	1	4.55
Fracture patella	1	4.55
Fracture calcaneum	1	4.55
Fracture shaft of fibula	1	4.55
Distal radial fracture	1	4.55
Non-orthopedic injury		
Urethral injury	4	18.18
Neurological injury	2	9.09
Perineal injury	1	4.55
Morel-Lavallee lesion	1	4.55
Chest injury	1	4.55

Table IV: Distribution of patients according to hospital stay (n=22).

Hospital stay (days)	Frequency	Percentage
(11-20)	8	36.36
21-30	11	50
>30	3	13.64
Total	22	100
Mean±SD	24.09±10.14	
Range (min-max)	(14 – 64)	

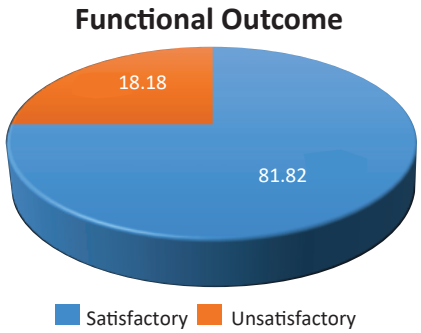


Figure 3 : Pie Chart showing the final functional outcome.

Discussion

This prospective interventional study was carried out to evaluate the radiological outcomes of the Tile Type-C pelvic ring fracture. Twenty-two patients with unstable pelvic ring fractures (Tile Type-C) were enrolled in this study within three weeks of incidence. They were admitted to Dhaka Medical College & Hospital (DMCH) from July 2019 to June 2021. In this study, the highest number of patients, 09(40.91%), were in the third decade, and the lowest number, 03(13.64%), were in the fifth decade. The mean age was 37.82±14.82 years, ranging from 18 to 60 years. Similarly, Mardanpour and Rahbar (2013), Moon et al. (2014) & Hossain et al. (2020) have observed almost identical mean ages of the patients, which were 37±10 years, 42.4 years & 37.75±13.4 years.12,13,1 In this current series, it was observed that among 22 patients, 18 (81.82%) were male, and 04(18.18%) were female. Similarly, Mardanpour and Rahbar (2013) showed that out of 27 patients with C-Type pelvic ring injuries, 22 (81.48%) were male & 05 (18.52%) were female patients.13 Kokubo et al. (2017) showed that out of 31 patients, 24(77.42%) were male & 07(22.58%) were female patients.14 In this series, it was observed that RTA caused most of the (86.36%) fractures, others due to falling from height (9.09%), and the fall of a heavy object (4.55%). Similarly, Mardanpour and Rahbar (2013) showed that the most frequent mode of injury in RTA is about 91%.13 Moon et al. (2014) showed that 75.47% of pelvic fractures are due to road traffic accidents, crush injuries in 11.32% of cases, falls in 7.55% of cases & falls of heavy objects in 5.66% of cases.12 Mohammed (2004) observed that the cause of injury was a road traffic accident in 92.1% of patients and a fall from height in 7.9% of patients.15 Regarding associated injuries in this series, it was observed that 04(18.18%) patients had associated urethral injury, 04(18.18%)

patients had lower limb fractures, 01(4.55%) patients had associated upper limb fractures, 02(9.09%) patient with associated lumbosacral plexus injury, 01(4.55%) patient had associated chest injury, 01(4.55%) patient had associated perineal injury, 01(4.55%) patients had associated Morel-Lavallee lesion & 36.36% patients had no associated injury. Similarly, Vidyarthi and Nayak (2018) showed that 17.6% had associated lower limb fracture, 14.3% of patients had associated upper limb fracture, and 12.7% had associated urethral injury.17 Hossain et al. (2020) showed that 16.09% of patients had associated urethral injuries & 12.93% of patients had associated lower limb fractures.1 Mardanpour and Rahbar. (2013) showed that 31.5% had a urologic injury, 29% had neurological injuries, 15.7% had an intra-abdominal hemorrhage, and 5.2% had a head injury.13 Choy et al. (2012) showed that 53% of the patients had associated injuries or other site fractures.[10] Mohammed (2004) included thirty-eight patients in his study, and 84.2% of patients had associated injuries.15 Regarding emergency interventions, it was observed in this study that an anterior external fixator was applied in 5(22.73%) patients, suprapubic cystostomy was done in 4(18.18%), upper tibial skeletal traction was given in 4(18.18%), tube thoracostomy done in 1(4.55%) & colostomy done in 01(4.55%) patient. Similarly, Hossain et al. (2020) showed that in 15% of cases anterior external fixator was applied, tube thoracostomy was done in 6%, suprapubic cystostomy in 17%, laparotomy in 3% & upper tibial skeletal traction in 10% cases.[1] The time interval between the injury & the operation was observed in this study that a maximum of patients 12(54.55%) were operated within 08-14 days, 09(40.90%) after 14 days & 01(4.55%) within 5-7 days after admission. Similarly, in the study of Kokubo et al. (2017), the time interval between injury & the operation was 0-18 days.14 In the study of Oh et al. (2016), the time interval was 17.4 days and ranged from 11 to 30 days.[8] In the study of Moon et al. (2014), the mean time from injury to operation was 7.8 days (range: 4-19 days).12 In the study of Hasan-khani and Omidi-Kashani (2013), all patients were operated on within 15 days of injury.2 In this current study, it was observed that the mean duration of hospital stay was 24.09±10.14 days with a range from 14 to 64 days. Similarly, Rafael Portela et al. (2019) showed that the mean time between admission & hospital discharge was 31.9 days.20 Wu et al. (2021) the average duration of hospital stay was 22.2 days with a range of 6 to 61 days.18 Mohammed (2004) reported that the total hospital stay was 29 days, ranging from 14 to 75 days.15 This current study observed postoperative complications in 36.36% of cases. Among them 02(9.09%) patients had wound infection, 02(9.09%) developed erectile dysfunction & 02(9.09%) developed urinary tract infection, 01(4.55%) patient developed screw loosening & 01(4.55%) patient developed pelvic obliquity. Similarly, in the study of Mardanpour and Rahbar (2013), 10.5% of patients developed deep wound infections, and 5.2% developed urinary tract infections.13 2.6% of patients had device failure, and 5.2% developed pelvic obliquity. In this series, functional outcome was assessed according to Majeed score which is made up of 07 sections: pain (30 points), work (20 points), sitting (10 points), sexual intercourse (4 points), walking aids (12 points), unaided gait (12 points) & walking distance (12 points). Out of a perfect Majeed score of 100 points, it was observed that the mean Majeed score in this study was 80.95±10.78. According to score grading in this study, excellent 12(54.55%), good 6(27.27%), fair 03(13.64%) & poor 01(4.55%). Similarly, in the study of Moon et al. (2014) the functional outcomes were excellent in 67.92% cases, good in 28.30% cases, fair in 3.77% cases.

Limitations

There are some limitations of this study; the study and follow-up period were short-term compared to other series, and a small sample size was taken in this study. Difficulties in the follow-up of patients due to the Covid-19 pandemic situation and post-operative CT scans could not be made in all patients. The results may not represent the scenario of unstable pelvic ring injuries in the whole country, so it will not be possible to reach an appropriate inference from this study.

Conflict of interest

The authors declare no conflict of interest. No funding was received from any source for conducting this study.

Conclusion and Recommendations

It is concluded that internal fixation of Tile Type-C pelvic ring fractures by anterior pelvic plating and posterior per-cutaneous iliosacral screw is a satisfactory and effective management method for early mobilization and rehabilitation of the patients. As the outcome evaluation was done six months after the operation, changes in outcome beyond six months, like mal-union, implant failure, infection, and symptom status could not be ascertained. So further study should be contemplated considering long-term evaluation. A large sample size should be taken for a further prospective study. A postoperative CT scan of the pelvis with 3-D reconstruction in all patients is recommended.

References

1. Hossain A, Islam S, Haque Qasem MF et al. Epidemiology of pelvic fractures in adult: Our experience at two tertiary care hospital in Dhaka, Bangladesh. J Clin Orthop Trauma. 2020 Nov-Dec;11(6):1162-1167.

2. Hasankhani EG, Omidi-Kashani F. Treatment outcomes of open pelvic fractures associated with extensive perineal injuries. Clin Orthop Surg. 2013 Dec;5(4):263-268.

3. Spanjersberg WR, Knops SP, Schep NW et al. Effectiveness and complications of pelvic circumferential compression devices in patients with unstable pelvic fractures: a systematic review of literature. Injury. 2009 Oct;40(10):1031-1035.

4. Black SR, Sathy AK, Jo C et al. Improved Survival After Pelvic Fracture: 13-Year Experience at a Single Trauma Center Using a Multidisciplinary Institutional Protocol. J Orthop Trauma. 2016 Jan;30(1):22-28.

5. Abrassart S, Stern R, Peter R. Unstable pelvic ring injury with hemodynamic instability: what seems the best procedure choice and sequence in the initial management? Orthop Traumatol Surg Res. 2013 Apr;99(2):175-182.

6. Marmor M, El Naga AN, Barker J et al. Management of Pelvic Ring Injury Patients With Hemodynamic Instability. Front Surg. 2020 Nov 12;7:588845.

7. van Vugt AB, van Kampen A. An unstable pelvic ring. The killing fracture. J Bone Joint Surg Br. 2006 Apr;88(4):427-433.

8. Oh HK, Choo SK, Kim JJ, Lee M. Stoppa Approach for Anterior Plate Fixation in Unstable Pelvic Ring Injury. Clin Orthop Surg. 2016 Sep;8(3):243-248.

9. Lindahl J, Hirvensalo E. Outcome of operatively treated type-C injuries of the pelvic ring. Acta Orthop. 2005 Oct;76(5):667-678.

10. Choy WS, Kim KJ, Lee SK, Park HJ. Anterior pelvic plating and sacroiliac joint fixation in unstable pelvic ring injuries. Yonsei Med J. 2012 Mar;53(2):422-426.

11. Matta JM, Saucedo T. Internal fixation of pelvic

ring fractures. Clin Orthop Relat Res. 1989 May;(242):83-97.

12. Moon do H, Kim NK, Won JS et al. Outcome of Surgical Treatment of AO Type C Pelvic Ring Injury. Hip Pelvis. 2014 Dec;26(4):269-274.

13. Mardanpour K, Rahbar M. The outcome of surgically treated traumatic unstable pelvic fractures by open reduction and internal fixation. J Inj Violence Res. 2013 Jul;5(2):77-83.

14. Kokubo Y, Oki H, Sugita D et al. Functional outcome of patients with unstable pelvic ring fracture. J Orthop Surg (Hong Kong). 2017 Jan;25(1):2309499016684322.

15. Zamzam MM. Unstable pelvic ring injuries. Outcome and timing of surgical treatment by internal fixation. Saudi Med J. 2004 Nov;25(11):1670-1674.

16. Mardanpour K, Rahbar M. The functional outcome of surgically treated unstable pelvic ring fractures by open reduction, internal fixation. Med J Islam Repub Iran. 2011 Jul 10;25(2):87-93.

17. Vidyarthi DA, Nayak D. Study of incidence and prevalence of pelvic fractures in Central India. J Med Sci Clin Res. 2018;1(3):446-453.

18. Wu S, Chen J, Yang Y et al. Minimally invasive internal fixation for unstable pelvic ring fractures: a retrospective study of 27 cases. J Orthop Surg Res. 2021 May 31;16(1):1-10.

19. Azar FM, Canale ST, Beaty JH. Campbell's Operative Orthopaedics, E-Book. Elsevier Health Sciences; 2020.

20. Portela R. Outcome of Unstable Pelvic Fractures after Internal Fixation: Our Experience. Ann Orthop Musculoskelet Disord. 2019;2(1): 1023

21. Halawi MJ. Pelvic ring injuries: Surgical management and long-term outcomes. J Clin Orthop Trauma. 2016 Jan-Mar;7(1):1-6.

22. Lindahl J, Hirvensalo E. Outcome of operatively treated type-C injuries of the pelvic ring. Acta Orthop. 2005 Oct;76(5):667-678.

Original Article

Pattern of Bronchial Asthma among Children at Urban Slums in Dhaka City

Islam S[1], Saha S[2], *Islam MM[3], Shimi SH[4], Sultana A[5], Azad MAK[6], Mollick MKU[7]

Abstract

Background: *Bronchial asthma is a common chronic disease affecting any age, race and socio- economic condition globally and its prevalence is changing upwards worldwide. The increase in prevalence may be due to changes in life style, rapid industrialization and increase in air pollution.* ***Materials and Methods:*** *This is a cross sectional descriptive study from two slums of Dhaka city and data were collected by interviewing and checklist. The study period was from January 2018 to June 2018.* ***Results:*** *Out of 201 patients the age of respondents were ranged from 10 to 17 years with mean age of 13.5years. About 62% respondents were male and 38% were female. About 77% of the respondents were illiterate . The monthly family income of the respondents was 2000tk - 9200tk with a mean income of 4422.39±1662.00tk. About 44%were suffering from bronchial asthma for a period of 1-4 years, 40.8% for a period of 4-7 years and rest 14.9% for >7years. Regarding family history of bronchial asthma it was seen that out of 82 respondents with family history, father was sufferer in case of 43 (52.4%), mother for 36(43.9%), brother for 2(2.4%) and in case of one (1.2%) respondent sister was the sufferer. 40.8% have a positive family history of bronchial asthma and rest 59.2% had no positive family history. About 47% had a positive previous working history in the factory and about 53% had no such type of working experience.* ***Conclusion:*** *In summary, our study suggests that bronchial asthma can affect any age of children including race and socio-economic class in urban slums.*

Keywords: Body mass index, Bronchial asthma.

Received: 08.05.2023, **Accepted:** 18.05.2023.

Ad-din Sakina Women's Medical College Journal. 2023; 4 (2) : 29-33

Introduction

Bronchial asthma is a common chronic disease affecting any age, race and socio- economic class globally and its prevalence is changing upwards worldwide.[1] The prevalence of asthma in the developing as well as developed world has increased over the recent decade. The increase in prevalence may be due to changes in life style, rapid industrialization and increase in air pollution. The surveys in adults show the high prevalence of asthma symptoms and reduced lung function in lower socio-economic group.[2–5]

Bronchial asthma is a chronic relapsing inflammatory disorder with increased responsiveness of tracheobronchial tree to various stimuli, resulting in paroxysmal contraction of bronchial airways. It refers to a condition of subjects with widespread narrowing of the bronchial airways which changes in severity over short periods of time, either spontaneously or under treatment, and is not due to cardiovascular disease.[6]

As an example, asthma may be defined as a chronic inflammatory disorder of the airways in which many cell types play a role, in particular mast cells, eosinophils, and T lymphocytes.[7] In susceptible individuals, this inflammation causes recurrent episodes of wheezing, breathlessness, chest tightness, and cough particularly at night and/or in the early morning. The inflammation also causes an associated increase in airway responsiveness to a variety of stimuli.[8] "Reactive airways dysfunction syndrome (RADS)" refers to

1. Dr. Md. Serajul Islam, Associate Professor, Department of Community Medicine, Ad-din Sakina Women's medical College, Jashore.
2. Dr. Sanjoy Saha, Associate Professor, Department of Pharmacology, Ad-din Sakina Women's medical College, Jashore.
3. Dr. Mir Moyeedul Islam, Associate Professor, Department of Pharmacology, Ad-din Sakina Women's medical College, Jashore. .
4. Dr. Shaima Hafiz Shimi, Assistant Professor, Department of Forensic Medicine, Ad-din Sakina Women's medical College, Jashore.
5. Dr. Afroza Sultana, Assistant Professor, Department of Anatomy, Ad-din Sakina Women's medical College, Jashore.
6. Dr. Mohammad Abul Kalam Azad, RMO, Matrichaya General Hospital, Beanibazar, Sylhet.
7. Professor Dr. Md. Kutub Uddin Mollick Department of Hepatology, Khulna Medical College, Khulna.

***Correspondence:** E-mail: ofuronto.shopno@gmail.com

the non-immunologic provocation of prolonged bronchial hyper responsiveness and airflow obstruction by exposure to an inhaled irritant.[9] Seven million people are suffering from bronchial asthma in Bangladesh. But scanty data is available to explain the risk factors for asthma in Bangladesh.[10] The prevalence of asthma symptoms exhibits large geographic variations, even among genetically similar groups, which suggests that differences may reflect variation in environmental factors.[11] Epidemiologic studies have demonstrated associations between asthma and exposure to household allergens, pets, tobacco smoke and environmental pollution, as well as sex, obesity, number of siblings and birth order and maternal education.[12–18]

Materials and Methods

This study was a cross-sectional descriptive study and conduction period was January 2021 to June 2021. Data from 201 bronchial asthma patients were collected and the study subjects were selected by purposive random sampling from the slums of Komolapur and Karail of Dhaka city. The respondents interested to participate with bronchial asthma were selected at the age range from 10 to 17 years according to the definition of adolescent of World Health Organization (WHO). Unwilling subjects and known cases of chronic bronchitis and bronchiectasis were excluded from the study.

Results

Table I: Age group of the respondents (n=201)

Age group of the respondents	Frequency	Percentage
10-12 years	59	29.4
13-15 years	104	51.7
16-17 years	38	28.9
Total	**201**	**100.0**

Table II: Occupation of the respondents (n=201)

Type of occupation	Frequency	Percentage
Rickshaw puller	31	15.4
Factory worker	90	44.8
Day labors	54	26.9
House wife	15	7.5
Student	11	5.5
Total	**201**	**100.0**

Table III: Period of suffering from bronchial asthma (n=201)

Period of suffering from bronchial asthma	Frequency	Percentage
1-4 years	89	44.3
>4-7 years	82	40.8
>7 years	30	14.9
Total	**201**	**100.0**

Table IV: Family history of bronchial asthma (n=201)

Family history of bronchial asthma	Frequency	Percentage
Yes	82	40.8
No	119	59.2
Total	**258**	**100.0**

Table V: Distribution of the respondents by type of factory in which they worked (n=94)

Type of factory	Frequency	Percentage%
Garments	54	57.45
Tannery	36	38.30
Brick field	4	4.25
Total	**94**	**100.0**

Table VI: Family history of bronchial asthma

Family history of bronchial asthma	Frequency	Percentage%
Yes	82	40.8
No	119	59.2
Total	**258**	**100.0**

Table VII: Distribution of the respondents working in any factory (n=201)

Working in any factory	Frequency	Percentage
Yes	94	46.8
No	107	53.2
Total	**201**	**100.0**

A total 201 respondents with complete data were included for the study. The respondents were ranged from 10-19 years with the mean age of 13.5 years and SD± 2.06 which included 124(62%) male and 77(38%) female. Major occupation of the respondents was working in the factory (44.8%) followed by day labors (26.9%). Majority of the respondents had a family of 5-8 members (73.1%) followed by 23.9% have 1-4 members. About 44% were suffering from bronchial asthma for a period of 1-4 years, 40.8% (82 in number) for a period of 4 -7 years and rest 14.9% (30 in numbers) for >7years. About 40.8% (82 in number) have a positive family history of bronchial asthma and rest 59.2% has no family history of bronchial asthma. Out of 82 respondents with family history, father was sufferer in case of 43 (52.4%), mother for 36 (43.9%), brother for 2 (2.4%) and in case of one (1.2%) respondent sister was the sufferer. 40.8% (82 in number) have a positive family history of bronchial asthma and rest 59.2% (119 in numbers) had no positive family history. About 46.8% (94 in number) had a positive previous working history in the factory and 53.2% (107 in numbers) had no such type of working experience.

Discussion

The aim of this study is to find out the pattern of bronchial asthma in the slum adolescents of Dhaka city. Bronchial asthma is a chronic disease and causes lots of sufferings in terms of time, money and physical fitness. The age of the respondents were ranged from 10 to 19 years with the mean age of 13.5 years SD ± 2.06. About 52% respondents were aged between 13-15 years followed by 10-12 years (29.4%) and 16-19 years (28.9%) respondents. Prevalence of asthma and its association with environmental tobacco smoke (ETS) exposure were examined among adolescent school children in Chandigarh, India. Using a previously standardized questionnaire, data from 9090 students in the 9 to 20 year age range were analyzed. There were 4367 (48%) boys, in whom the observed prevalence of asthma was 2.6%. Among 4723 (52%) girls, asthma was present in 90 (1.9%) students.[19] In this study, 62% of the respondents were male (124 in number) and 38% were female (77 in number). In another study, S. Agarwal et al. the prevalence of asthma among man was 1.8% and 1.9% in women with higher rates in rural than urban areas.[20] So, this study shows quite similarity with our study. Seventy seven percentages of the respondents were illiterate 155 in number out of 201. Most of the slum adolescents were Muslims (191 in number) and 10 were Hindus. So, our study shows that illiterate and Muslim people are affected in asthma. S. Agarwal et al. showed that illiterate men (2.6%,95%CI 2.1-3.1) and women (2.1%,95%CI 1.9-2.3) had a much higher prevalence of asthma than those with middle school and higher education, while Muslim people are more likely to report asthma than Hindu. So, our study shows similarity with the study of S. Agarwal et al. As our study conducted in urban slums major occupation of respondents were working in the factory (44.8%) followed by day laborer (26.9%). rickshaw puller (15.4%),

housewife (7.5%) and students (5.5%).M.A Tageldin et al. showed that as regards to occupation 46% cases were housewives and 15% were employee who are mostly exposed to indoor and outdoor pollution may affect by asthma.[21] Our study shows more than half of the respondents were unmarried (64.7%) followed by 23.4% married adolescents and 11.9% separated. But S. Agarwal study shows that who were widowed/divorced/separated/deserted were more likely to report asthma. So, our study shows partial similarity to S. Agarwal study. As, unmarried women condition as stressful, there is potential role of emotional stress in asthma development.[22] Our study shows that 40.8% of the studied cases had positive family history of bronchial asthma which shows quite similarity with the study of M.A.Tageldin et al.22 Out of 94, 54 were working in the garments, 36 in the tannery and 4 in the brick field. Epidemiologic studies have demonstrated associations between asthma and exposure to household allgergens[12], Pets[13], environmental tobacco smoke[14] and environmental pollution[15], as well as sex[16], obesity[17], number of siblings and birth order[18], and maternal education.[23]

Conclusion

In conclusion, we can say that bronchial asthma is a common chronic illness affecting any age of children including their race and socio-economic class globally and its prevalence is changing upwards worldwide.

References

1. Vollmer WM, Buist AS, Osborne ML. Twenty year trends in hospital discharges for asthma among members of a health maintenance organization. J Clin Epidemiol. 1992 Sep;45(9): 999-1006.

2. Watson JP, Cowen P, Lewis RA. The relationship between asthma admission rates, routes of admission, and socioeconomic deprivation. Eur Respir J. 1996 Oct;9(10):2087-2093.

3. Walters S, Phupinyokul M, Ayres J. Hospital admission rates for asthma and respiratory disease in the West Midlands: their relationship to air pollution levels. Thorax. 1995 Sep;50(9): 948-954.

4. Erzen D, Carriere KC, Dik N et al. Income level and asthma prevalence and care patterns. Am J Respir Crit Care Med. 1997 Mar;155(3):1060 -1065.

5. Eachus J, Williams M, Chan P et al. Deprivation and cause specific morbidity: evidence from Sommerset and Avon surve; of health. British Med J. 1996; 312:287-292.

6. Irvin CG, Eidelman D. Airways mechanics in asthma. In: Rhinitis and Asthma. Blackwell Scientific Publications. Boston 1995. Vol: 123; Page-23- 26.

7. Global Initiative for Asthma Management and Prevention. NHLBI/WHO Workshop Report, US Department of Health and Human Services. National Institutes of Health, Bethesda, 1995; Pub#95-3659.

8. Fahy JV, O'Byrne PM. "Reactive airways disease". A lazy term of uncertain meaning that should be abandoned. Am J Respir Crit Care Med. 2001 Mar;163(4):822-823.

9. National Asthma Education and Prevention Program: Expert panel report3: Guidelines for the diagnosis and management of asthma. Bethesda, MD: National Heart, Lung, and Blood Institute, 2007. (NIH publication no. 08- 4051). Full text available online: www.nhlbi.nih.gov/guidelines/asthma/asthgdln.htm (Accessed May 1, 2010).

10. Zaman K, Takeuchi H; Md Yunus; El Arifeen S, Chowdhury HR, Baqui AH, Wakai S, Iwata T.

Asthma in rural Bangladeshi children. Indian J Pediatr. 2007 Jun;74(6):539-543.

11. Worldwide variation in prevalence of symptoms of asthma, allergic rhinoconjunctivitis, and atopic eczema: ISAAC. The International Study of Asthma and Allergies in Childhood (ISAAC) Steering Committee. Lancet. 1998 Apr 25;351(9111):1225-1232.

12. Platts-Mills TA, Carter MC. Asthma and indoor exposure to allergens. N Engl J Med. 1997 May 8;336(19):1382-1384.

13. Hesselmar B, Aberg N, Aberg B et al. Does early exposure to cat or dog protect against later allergy development? Clin Exp Allergy. 1999 May;29(5):611-617.

14. Halken S, Høst A, Nilsson L et al. Passive smoking as a risk factor for development of obstructive respiratory disease and allergic sensitization. Allergy. 1995 Feb;50(2):97-105.

15. Guo YL, Lin YC, Sung FC et al. Climate, traffic-related air pollutants, and asthma prevalence in middle-school children in taiwan. Environ Health Perspect. 1999 Dec;107(12): 1001-1006.

16. Weiss ST, Gold DR. Gender differences in asthma. Pediatr Pulmonol. 1995 Mar;19(3): 153-155.

17. Cassol VE, Rizzato TM, Teche SP et al. Prevalência e gravidade da asma em adolescentes e sua relação com índice de massa corporal [Prevalence and severity of asthma among adolescents and their relationship with the body mass index]. J Pediatr (Rio J). 2005 Jul-Aug;81(4): 305-309. Portuguese.

18. Wickens K, Crane J, Pearce N, Beasley R. The magnitude of the effect of smaller family sizes on the increase in the prevalence of asthma and hay fever in the United Kingdom and New Zealand. J Allergy Clin Immunol. 1999 Sep;104(3 Pt 1):554-558.

19. Johnstone DE, Dutton A. The value of hyposensitization therapy for bronchial asthma in children--a 14-year study. Pediatrics. 1968 Nov;42(5):793-802.

20. Agrawal S, Pearce N, Ebrahim S. Prevalence and risk factors for self-reported asthma in an adult Indian population: a cross-sectional survey. Int J Tuberc Lung Dis. 2013 Feb;17(2):275-282.

21. M.A.Tageldin,K.Waigh,O.Maher. Study the pattern of bronchial asthma any outpatients clinic at Sohag & Akhmeen chest hospitals. Egypt. J. Chest Dis. Tuberc. 2015;64,313-323.

22. Douwes J, Pearce N. Asthma and the westernization 'package'. Int J Epidemiol. 2002 Dec;31(6):1098-1102.

23. Cesaroni G, Farchi S, Davoli M, Forastiere F, Perucci CA. Individual and area-based indicators of socioeconomic status and childhood asthma. Eur Respir J. 2003 Oct;22(4):619-624.

Ad-din Sakina Women's Medical College Journal

Name of the Honorable Reviewers

- **Prof. Dr. Shyamal Kumar Saha**
  Professor & Head
  Department of Pharmacology
  United Medical College. Dhaka.

- **Prof. Dr. Md. Jahangir Hossain Bhuiyan**
  Professor
  Department of Surgery
  Ad-din Sakina Women's Medical College Jashore.

- **Prof. Dr. Abu Hena Mostafa Kamal**
  Professor & Head
  Department of Biochemistry
  Army Medical College Jashore.

- **Prof. Dr. Marufa Akhter**
  Professor & Head
  Department of Biochemistry
  Ad-din Sakina Women's Medical College, Jashore.

Ad-din Sakina Women's Medical College
Pulerhat, Jashore, Bangladesh.
Phone: +880421-68808, E-mail: www.aswmc.edu.bd