ISSN-0301-035X(Print)
2219-1607(Online)

Bangladesh Medical Journal

Official Organ of Bangladesh Medical Association

Vol. 51 No. 2 May 2022

BMA Executive Committee for The Year 2017-2018

Sl.	Name	Name of Post
1.	Dr. Mustafa Jalal Mohiuddin	President
2.	Dr. Kanak Kanti Barua	Vice President (Dhaka City)
3.	Dr. Jamal Uddin Khalifa	Vice President (Dhaka Division)
4.	Dr. Md. Kamrul Hassan (Salim)	Vice President (Barisal Division)
5.	Dr. Sheikh Mohammed Shafiul Azam	Vice President (Chittagong Division)
6.	Dr. Sk. Baharul Alam	Vice President (Khulna Division)
7.	Dr. Md. Mostafa Alam (Nannu)	Vice President (Rajshahi Division)
8.	Dr. Md. Delwar Hossain	Vice President (Rangpur Division)
9.	Dr. Murshed Ahmed Chowdhury	Vice President (Sylhet Division)
10.	Dr. A N M Fazlul Hoq Pathan	Vice President (Mymensingh Division)
11.	Dr. Md. Ehteshamul Huq Choudhury	Secretary General
12.	Dr. Mohd. Zahid Hussain	Treasurer
13.	Dr. Md. Kamrul Hasan (Milon)	Joint Secretary General
14.	Dr. Md. Tarique Mehedi Parvez	Organizing Secretary
15.	Dr. Shahryar Nabi (Shakil)	Scientific Secretary
16.	Dr. Md. SK. Shahid Ullah	Office Secretary
17.	Dr. Md. Mahbubur Rahman (Babu)	Publicity & Public Relation Secretary
18.	Dr. Sohel Mahmud	Social Welfare Secretary
19.	Dr. Purabi Rani Debnath	Cultural & Entertainment Secretary
20.	Dr. Kazi Shafiqul Halim (Zimmu)	Library & Publication Secretary
21.	Dr. Md. Abul Hashem Khan	International Affairs Secretary
22.	Dr. Mohammed Salim	Member, Central Executive Committee
23.	Dr. Md. Abdul Aziz	Member, Central Executive Committee
24.	Dr. Md. Moniruzzaman Bhuiyan	Member, Central Executive Committee
25.	Dr. Mohammad Mushtuq Husain	Member, Central Executive Committee
26.	Dr. Md. Jamal Uddin Chowdhury	Member, Central Executive Committee
27.	Dr. Md. Shafiqur Rahman	Member, Central Executive Committee
28.	Dr. Md. Sharfuddin Ahmed	Member, Central Executive Committee
29.	Dr. Qazi Shahidul Alam	Member, Central Executive Committee
30.	Dr. Md. Abu Raihan	Member, Central Executive Committee
31.	Dr. M Nazrul Islam	Member, Central Executive Committee
32.	Dr. Zahurul Huq Sachchu	Member, Central Executive Committee
33.	Dr. Md. Abu Yusuf Fakir	Member, Central Executive Committee
34.	Dr. Ehsanul Kabir Joglul	Member, Central Executive Committee
35.	Dr. Md. Zulfikar Ali (Lenin)	Member, Central Executive Committee
36.	Dr. Uttam Kumar Barua	Member, Central Executive Committee
37.	Dr. Chitta Ranjan Das	Member, Central Executive Committee
38.	Dr. Md. Jabed	Member, Central Executive Committee
39.	Dr. Hasanur Rahman	Member, Central Executive Committee
40.	Dr. Md. Babrul Alam	Member, Central Executive Committee
41.	Dr. Hossain Muhammad Mustafijur Rahman	Member, Central Executive Committee
42.	Dr. Muhammad Harun-Ar-Rashid	Member, Central Executive Committee
43.	Dr. Mahmud Hasan	Member, Central Executive Committee
44.	Dr. M Iqbal Arslan	Member, Central Executive Committee
45.	Dr. Syed Atiqul Haq	Chairman, Bangladesh Medical Journal & Member, Central Executive Committee
46.	Dr. Rokeya Sultana	Member, Central Executive Committee
47.	Dr. Badiuzzaman Bhuiyan (Dablu)	Member, Central Executive Committee
48.	Dr. Kamrul Hasan Khan	Member, Central Executive Committee
49.	Dr. Momenul Haq	Member, Central Executive Committee
50.	Dr. Md. Shahidullah Sikder	Member, Central Executive Committee
51.	Dr. Pabitra Kumar Debnath	Member, Central Executive Committee

Information for Authors

Submission of manuscripts:

Papers are accepted for publication with an understanding that they are submitted solely to the Bangladesh Medical Journal and are subject to peer review and editorial revision. Statement and opinions expressed in the papers, communications and letters herein are those of author(s) and not necessarily of the editors or publishers. Three hard copies along with a soft copy should be sent to the executive editor of Bangladesh Medical Journal, BMA Bhaban, 15/2, Topkhana Road, Dhaka-1000.

Bangladesh Medical Journal publishes the following:

Full papers, review articles, letters to the editors, debate and opinion papers, editorials, on being a doctor, medical news, medical jokes/poem.

Letters to the editor – letters are invited that discuss, criticize or develop themes on national or international issues related to doctors, medical science or medical profession. Clinical observations, original research presented in a research letter format or case reports or series may be included in letters to the editors. Comments on papers published in Bangladesh Medical Journal are also encouraged. Acceptance will be at the discretion of the editorial board, and editorial changes may be required. Wherever possible, letters from responding authors will be included in the same issue.

Form of full papers submitted for publication:

Full papers should be no more than 4000 words. The onus of preparing a paper in a form suitable for sending to press lies with the author. Authors are advised to consult a current issue in order to make themselves familiar with the journal regarding typographical and other conventions, layout of tables etc. Authors are encouraged to consult the latest guidelines produced by the International Committee of Medical Journal Editors (ICMJE), which contains a lot of useful generic information about preparing scientific papers (http://www.icmje.org/manuscript_a.html) Manuscripts should be typed on one side of white good quality A4 size paper, with wide margins of at least 2cm and using double space throughout, the preferred font being Garamond size 12. Words at the end of lines should not be hyphenated unless hyphens are to be printed. Page numbering is required. Spelling should generally be that of the Concise Oxford Dictionary, 11th ed. Oxford: Clarendon press. Each component of the manuscript should begin on a new page in the sequence of title page, abstract, text, reference, tables and legends for illustration. The title page should include the title of the paper, name of the author(s), and name of the departments(s) to which the work should be attributed. The first six authors of a work should be named, followed by "et al." if there are more than six.

The unstructured abstract of 150 words should follow the title page. It should provide the context or background for the study and should state the study's purpose, basic procedures (selection of study subjects or laboratory animals, observational and analytical methods), main findings (giving specific effect size and their statistical significance, if possible), and principal conclusion.

The text should be presented in the form of Introduction, Methods, Results and Discussion.

References:

These should be given in the text using the Vancouver system. They should be numbered consecutively in the order in which they first appear in the text using superscript. If a reference is cited more than once the same number should be used each time. References cited only in tables and figures and not in the text should be numbered in sequence from the last number used in the text and in the order of mention of the individual tables and figures in the text. At the end of the paper, on a page(s) separate from the text, references should be listed in numerical order. The journal adheres closely to the Vancouver style of references (see http:// www.nlm. nih.gov/bsd/uniform_ requirements. html, updated 2013).

Sample references are given below –

1. Standard Journal Article

List the first six authors followed by et al:

Halpern SD, Ubel PA, Caplan AL. Solid-organ transplantation in HIV-infected patients. N Engl J Med. 2002 Jul 25; 347(4): 284-7

As an option, if a journal carries continuous pagination throughout a volume (as many medical journals do) the month and issue number may be omitted:

Halpern SD, Ubel PA, Caplan AL. Solid-organ transplantation in HIV-infected patients. N Engl J Med. 2002; 347:284-7

More than six authors:

Rose ME, Huerbin MB, Melick J, Marion DW, Palmer AM, Schiding JK, et al. Regulation of interstitial excitatory amino acid concentrations after cortical contusion injury. Brain Res. 2002;935(1-2):40-6

Optional addition of a database's unique identifier for the citation:

Halpern SD, Ubel PA, Caplan AL. Solid-organ transplantation in HIV-infected patients. N Engl J Med. 2002 Jul 25;347(4):284-7. PubMed PMID: 12140307

Organization as author:

Diabetes Prevention Program Research Group.

Hypertension, insulin, and proinsulin in participants with impaired glucose tolerance. Hypertension. 2002;40(5): 679-86 No author given:

21st century heart solution may have a sting in the tail. BMJ. 2002;325(7357):184

Volume with supplement:

Geraud G, Spierings EL, Keywood C. Tolerability and safety of frovatriptan with short- and long-term use for treatment of migraine and in comparison with sumatriptan. Headache. 2002;42 Suppl 2:S93-9.

Issue with supplement:

Glauser TA. Integrating clinical trial data into clinical practice. Neurology. 2002;58(12 Suppl 7):S6-12.

Article published electronically ahead of the print version: Yu WM, Hawley TS, Hawley RG, Qu CK. Immortalization of yolk sac-derived precursor cells. Blood. 2002 Nov 15; 100(10):3828-31. Epub 2002 Jul 5.

2. Books and Other Monograph Personal author(s):

Murray PR, Rosenthal KS, Kobayashi GS, Pfaller MA. Medical microbiology. 4th ed. St. Louis: Mosby; 2002.

3. Other Published Material MaterialNewspaper article:

Tynan T. Medical improvements lower homicide rate: study sees drop in assault rate. The Washington Post. 2002 Aug 12; Sect. A:2 (col. 4).

Dictionary and similar references:

Dorland's illustrated medical dictionary. 29th ed. Philadelphia: W.B. Saunders; 2000. Filamin; p. 675.

4. Unpublished Material (In press or Forthcoming:)

Tian D, Araki H, Stahl E, Bergelson J, Kreitman M. Signature of balancing selection in Arabidopsis. Proc Natl Acad Sci U S A. Forthcoming 2002.

5. Journal Article on the Internet

Abood S. Quality improvement initiative in nursing homes: the ANA acts in an advisory role. Am J Nurs [Internet]. 2002 Jun [cited 2002 Aug 12];102(6):[about 1 p.]. Available from: http://www.annals.org/ cgi/reprint/ 145/1/62.pdf

Tables :

Table should have brief title for each, should be numbered consecutively using Roman numerals and be cited in the text in consecutive order. Internal horizontal and vertical rules should not be used.

Illustration :

All drawings should be made with black Indian ink on white paper. Photographs and photomicrographs should be supplied as glossy black and white prints unmoundted. All photographs, graphs and diagrams should be referred to as figures numbered consecutively in the text in Arabic numerals.

Abbreviation :

Except for units of measurement, abbreviations are discouraged. Consult scientific style and forma. The CBE manual for authors, editor and publishers (Sixth edition New York: Cambridge University Press, 1994) for lists of standard abbreviation. The first time an abbreviation appears, it should be preceded by the words for which it stands.

Drug names :

Generic name should generally be used. When proprietary brands are used in research, include the brand name in parentheses in the methods section.

Permission :

Materials taken from other source must be accompanied by a written statement from both author and publishers giving permission to the journal for reproduction. Obtain permission in writing from at least one author of papers that is still in press, unpublished data and personal communications.

The editor of Bangladesh Medical Journal reserves the customary right to style and if necessary shortens the material accepted for publication and to determine the priority and time of publication. Editor assumes that the manuscript submited by the author is based on honest observations. It is not a task of the editor to investigate scientific fraud paper.

Bangladesh Med J. 2022 May; 51(2)
DOI: https://doi.org/10.3329/bmj.v51i2.69238

Original Article

Association of Risk Factors and Inflammatory Bowel Disease: a Case Control Study in a Tertiary Level Hospital

*Newaz AAS[1], Niaz MK[2], Arafat MY[3], Ahmed F[4], Raha A[5], Islam S[6], Islam KMS[7], Chowdhury MFK[8]

ABSTRACT

The rising incidence of inflammatory bowel disease (IBD) in Bangladesh supports the importance of various risk factors in disease etiology. This case-control study aims to measure association of IBD among the patients who were exposed to various risk factors. The study was conducted in patients with IBD and a control group without IBD in the Department of Gastroenterology, Bangabandhu Sheikh Mujib Medical University (BSMMU), Bangladesh during the period of March 2016 to January 2018. Diagnosed IBD patients aged more than eighteen years admitted or visiting for follow up in the Department of Gastroenterology were selected as cases. Controls were selected from patient's attendants other than IBD, where age and sex were matched with cases. Controls were non-relative to the cases in the same department, and free from any bowel symptoms. Data were collected by using pre-tested questionnaire and then analyzed. Total 164 participants were selected among them 82 cases and 82 controls. Among the cases, 38 patients were diagnosed as ulcerative colitis and 44 patients were diagnosed as Crohn's disease. Study found that ulcerative colitis were associated with the following factors namely being smoker (OR 20.31; 95% CI 2.39-172), exposure to pets (OR 11.24; 95% CI 1.86-67.76), not drinking boiling water (OR 7.33; 95%CI 1.62-33.05), bathing in open water such as river and ponds (OR 5.04; 95% CI 1.04-24.40), walking bare footed in grounds and toilet (OR 10.49; 95% CI 2.08-52.78), taking street food (OR 5.17; 95% CI1.15-23.28) and soft drinks (OR 11.55; 95% CI 0.24-9.48), where high odds ratios (OR) were measures. On the other hand, crohn's disease were associated with the factors of being smoker (OR 10.30; 95%CI 1.15-91.9), exposure to pets (OR 19.19; 95% CI 1.74-211), not drinking boiling water (OR 10.33; 95% CI 2.54-43.51), bathing in open water such as river and ponds (OR 6.48;95% CI 1.35-31.09), consuming unpasteurized milk (OR 8.50; 95% CI 1.71-42.10) and soft drinks (OR 42.74; 95% CI 5.56-328). This study determined the risk factors of IBD in the ground of childhood behavior, hygienic condition and dietary habit for the development of IBD.

Keywords: *IBD, ulcerative colitis, crohn's disease.*

1 *Dr. Abdullah Al Shah Newaz, Registrar, Sheikh Russel National Gastroliver Institute & Hospital (SRNGIH), Mohakhali, Dhaka. Email- shahnewaz.raheed@gmail.com
2 Maj. Dr. Md. Kaisar Niaz, Classified Specialist Medicine (Gastroenterology), CMH, Jessore
3 Dr. Md. Yasir Arafat, Medical Officer, SRNGIH, Mohakhali, Dhaka.
4 Dr. Farid Ahmed, Assistant Professor, SRNGIH, Mohakhali, Dhaka.
5 Dr. Arunangshu Raha, Assistant Professor, SRNGIH, Mohakhali, Dhaka.
6 Dr. Susmita Islam, Assistant Professor, Department of Gastroenterology, BSMMU.
7. Dr. K. M. Shaiful Islam, Assistant Professor, Department of Pediatric Surgery, BSMMU.
8. Dr. Md. Fazlul Karim Chowdhury, Assistant Professor, Department of Gastroenterology, BSMMU.
*For correspondence

INTRODUCTION

Inflammatory bowel diseases (IBD) are chronic inflammatory disorders of the gastrointestinal tract marked by episodes of relapse and remission. There are two identified subtypes of the disease, ulcerative colitis (UC) and Crohn's Disease (CD), which differ in patterns of involvement. Though varying in clinical presentation, the two subtypes share a presumed etiology of genetic predisposition, environmental risk factors or exposures, and alterations of the gut micro biome that contributes to the manifestation of disease. Ongoing changes in environmental factors, including infections, diet, lifestyle factors, and medication use have contributed to shifts in the global prevalence of the disease.[1] There is a rising incidence of UC in North India may be attributable to inadequate sanitary measures.[2]

The incidence of IBD has increased dramatically over the past half century.[3] Although more than 160 genetic risk loci have been identified that underlie disease predisposition,[4] these loci have not completely explained the disease etiology. Striking epidemiological observations including the rising incidence in developing countries and the increased risk of disease in migrant populations implicate the importance of environmental influence on genetic predisposition.[5]

Regarding Asia a study carried in eight countries of Asia and Australia showed in multivariate model, being breast fed >12 months, antibiotic use, having dogs, daily tea consumption and daily physical activity decreased the odds for CD in Asians. On the other hand, being breastfed >12 months, antibiotic use, daily tea or coffee consumption, presence of hot water taps and flush toilet in childhood were protective for UC development whereas ex-smoking increased the risk of UC. This first population-based study of IBD risk factors in Asia-Pacific supports the importance of childhood immunological, hygiene and dietary factors in the development of IBD, suggesting that markers of altered intestinal microbiota may modulate risk of IBD later in life.[5]

UC was first described by Wilks in 1859. In Bangladesh, it was first studied in 1975.[6] UC is a chronic idiopathic inflammatory condition of gastrointestinal tract, caused by inappropriate and continuing inflammatory response to gut micro biome on background of genetic susceptibility.[7] UC is precipitated by complex interaction of environment, genetic and immunoregulatory factors. Family history is a major risk factor for UC although sporadic cases do occur at large.[8] UC primarily affects the colonic mucosa; the extent and severity of colon involvement are variable. In its most limited form, it may be restricted to the distal rectum, while in its most extended form the entire colon is involved. However, 80% of the patients present with disease extending from the rectum to the splenic flexure, and only 20% have pancolitis. It involves rectum in about 95 % cases and may extend proximally in a symmetrical, circumferential and uninterrupted pattern.[9]

Dr. Burrill Bernard Crohn and his colleague, Dr. Gordon Oppenheimer and Dr. Leon Ginzburg discover the CD in 1930 with the disease named after Dr. Burrill B Crohn. Crohn's disease can affect any part of GIT but it affects ileal and ileocolic region 40% Small intestine 30 to 40% only colon 20% and perianal region <10% it has been proposed.[10]

The clinical features of UC include diarrhea mixed with blood and mucus, constipation, abdominal pain and tenderness weight loss, low grade fever and anaemia.[11, 12] UC can be associated with a number of local as well as extra intestinal complication. The local complication includes fulminate colitis, perforation, massive haemorrhageand colorectal carcinoma[13,14] extra intestinal complication include iritis, arthritis, panniculitis, Deep vein thrombosis, primary sclerosing cholangitits and cholangiocarcinoma.[1-17]

The heterogeneity of manifestations, a potentially insidious onset, the presence of overlapping features with other IBD, and or the presentation without GI symptoms (i.e, extraintestinal symptoms), can make the diagnosis of CD difficult.[18] Characteristic symptoms of chronic or nocturnal diarrhea and abdominal pain, weight loss, fever, or rectal bleeding reflect the underlying inflammatory process.[19,20]

Disease severity is assessed by The Truelove–Witts's criteria for acute severe UC are ≥ 6 bloody stools/24 hrs plus one or more of anaemia, fever, tachycardia, and high inflammatory markers.[21] Disease severity of CD can be assessed by Harvey-Bradshaw Index.[22]

Procto-sigmoidoscopy or colonoscopy will reveal the mucosal changes characteristic of UC, consisting of loss of the typical vascular pattern, granularity, friability, and ulceration.[23-25] These changes typically involve the distal rectum, both endoscopically and histologically[26] and proceed proximally in a symmetric, continuous, and circumferential pattern to involve all or part of the colon.[27] CD may be suggested by certain histologic findings such as noncaseating granulomas or microscopic focality, but their absence does not rule out the diagnosis. Furthermore, even in UC or in acute self-limited colitis, mucrophage (or "cryptolytic") granulomas may form in response to ruptured crypts and are therefore not pathognomonic for CD.[28] The diagnosis of CD is based on a composite of endoscopic, radiographic, and pathological findings documenting focal, asymmetric, transmural, or granulomatous features.[9] Endoscopic feature includes apthoid ulcer, mucosal edema, luminal narrowing, cobblestoning. Rectal sparing is more specific and discontinuous segmental nature of the disease has high positive predictive value. The discontinuous segmental nature of the disease is an important clue.[29]

Other histologic findings that may suggest an infectious etiology include caseating or confluent granulomas in tuberculosis (or less commonly in schistosomiasis, syphilis, and Chlamydia trachomatis), trophozoites in amebiasis, pseudomembranes in C. dificile colitis (although in UC, most cases of C. dificile infection occur in the absence of pseudomembranes), ova in schistosomiasis, and viral inclusions in herpetic or cytomegaloviral colitis, although the latter appears almost exclusively in immunocompromised patients.[30] In the appropriate clinical settings, sigmoidoscopy or colonoscopy and biopsy may also distinguish the various noninfectious colitides

from UC. These conditions include ischemia, radiation, collagenous and microscopic colitis, drug-induced colitis, and the solitary rectal ulcer syndrome.[31,32]

The inflammatory bowel diseases (IBD) traditionally have afflicted patients in the Western world. In the last two decades, however, there have been numerous studies reporting the emergence of IBD in Asia, where the prevalence of IBD has historically been low.[33-38] Improved diagnostic methods and physician awareness of the disease are unlikely to account fully for the rapid increase in IBD cases in Asia. The incidence and prevalence of IBD were considerably lower than those reported in Western populations, but that they have been increasing over time. The emergence of IBD in Asia has important implications for healthcare policy planners who will need to address both the health needs of the individual and the social burden exerted by these diseases.[39-41]

Currently, the annual incidence of CD is highest in North America (20.2 per 100,000, per person years) whereas the annual incidence of UC is highest in Europe (24.3 per 100,000 per person years). The prevalence of both UC and CD are highest in Europe (505 and 322, per 100,000 per person years respectively).[3] The global prevalence of UC has seen a discernible shift in past decade. A study was performed on 2003 in Ludhiana showing prevalence rate of UC is 44.3/10000 and incidence is 6.02/100000[2]. Ongoing changes in environmental factors, including infections, diet, lifestyle factors, and medication use have contributed to shifts in the global prevalence of the disease.[1] There is a rising incidence of UC in North India may be attributable to inadequate sanitary measures[2]. But the risk factors impacting our population are not yet known. Therefore, this study is to see the association between environmental risk factors and inflammatory bowel disease in patients attending at the department of gastroenterology of Bangabandhu Sheikh Mujib Medical University (BSMMU) in Bangladesh.

MATERIALS AND METHODS

This is was a case control study and was conducted in the Department of Gastroenterology of Bangabandhu Sheikh Mujib Medical University (BSMMU) in Bangladesh. The study period was March 2016 to January 2018. The case group was diagnosed IBD patients aged more than eighteen years admitted or visiting for follow up in Department of Gastroenterology. And the control group was age and gender matched attendants of patient in the same department other than IBD, non-relative to the cases and free from any bowel symptoms were selected. The sample size of this study was 164, where 82 were case and 82 were controls. Data were collected by using pre-tested questionnaire, patients were interviewed for socio-demographic factors, various risk factor, behavioral factors and some disease conditions related to IBD. Before starting this study, the research protocol was submitted to the institutional review board of BSMMU, Dhaka.

Statistical analysis:

Computer based statistical analysis were carried out with Statistical Package for the Social Sciences (SPSS). Data were recorded systemically in preformed data collection form (questionnaire). P value <0.05 were labeled as statistically significant. The results were expressed with 95% Confidence Interval (CI) and adjusted for known confounders. In the initial analysis the distribution of hygiene-related variables, potential confounders such as age, sex, family history of IBD, socio-economic status like education, monthly income, and other variables of interest like smoking, use of OCP, previous history of tuberculosis were compared between the cases and controls. The summarized data was interpreted accordingly and then presented in the form of tables and figures. Continuous variables were expressed as mean with standard deviation and categorical variables as count with percentage.

RESULTS

This case control study was conducted in the Department of Gastroenterology, BSMMU, Bangladesh during the period of March 2016 to January 2018. A total of 82 cases and 82 controls were included in this study.

Table 1 shows demographic profile of the study populations 82 cases and 82 controls were included. Among the cases, 44(53.7%) patients were Crohn's disease and 38(46.3) patients were Ulcerative colitis. Among the cases, 48(58.5%) were male and 34(41.5%) were female. Among the control group, 54(65.9%) were male and 28(34.1%) were female. Mean age of cases were 36.46 and of controls were 36.70.

Table 1: Demographic profile of the study population in both groups (n=164)

Variables		
Sex	Case Group	Control
Group		
Male	48 (58.5%)	54 (65.9%)
Female	34 (41.5%)	28 (34.1%)
Age (Mean ±SD)	36.46 ± 8.76	36.70 ± 11.81

Table II shows different socio demographic and various risk factor associated with UC including behavioral factors and some disease conditions and related to UC with their frequency and percentage in the study population (cases)

Table II. Socio demographic and childhood factors in UC with their frequency and percentage (n= 38)

	Frequency (n)	Percentage (%)
Age (median)	35 (22-65)	
Sex (female/male)	24/14	63.2/36.8
Family history of IBD	2	5.3
Smoker	13	34.2
Alcoholic	0	0.0
Drink non safe water	1	2.6
Don't boil water before drink	24	63.2
Wash with unsafe water	4	10.5
Don't wash hand before meal	16	42.1
Don't wash hand after using toilet	6	15.8
Bathing in open water	34	89.5
Use non hygiene toilet	1	2.6
Walking bear footed to toilet	33	86.8
Living abroad	5	13.2
No breast feeding	1	2.6
No exclusive breast feeding	9	23.7
Bottle feeding	11	28.9
Exposure to pets	28	73.7
Exposure to domestic animals	30	78.9
Not taking Antihelminthic	26	68.4
Tonsillectomy	0	0.0
Appendisectomy	1	2.6
Tuberculosis infection	0	0.0
Tuberculosis infection (family member)	3	7.9

Table III shows different socio demographic and various risk factor associated with CD including behavioral factors and some disease conditions and related to CD with their frequency and percentage in the study population (cases)

Table III. Socio demographic and childhood factors in CD with their frequency and percentage (n= 44)

	Frequency (n)	Percentage (%)
Age (median)	33.5 (19-60)	
Sex (female/male)	30/14	68.2/31.8
Smoker	13	29.5
Alcoholic	1	2.3
Family history of IBD	5	11.4
Living abroad	7	15.9
No breast feeding	6	13.6
No exclusive breast feeding	17	38.6
Bottle feeding	14	31.8
Exposure to pets	33	75.0
Exposure to domestic animals	27	61.4
Not taking Antihelminthic	30	68.2
Drink non safe water	1	2.3
Don't boil water before drink	28	63.6
Wash with unsafe water	9	20.5
Don't wash hand before meal	15	34.1
Don't wash hand after using toilet	6	13.6
Bathing in open water	37	84.1
Use non hygiene toilet	2	4.5
Walking bear footed to toilet	34	77.3
Tonsillectomy	2	4.5
Appendisectomy	9	20.5
Tuberculosis infection	11	25.0
Tuberculosis infection (family member)	5	11.4

Table IV. Dietary and other factors in UC with their frequency and percentage (n= 38)

	Frequency (n)	Percentage (%)
Consuming unpasteurized mild	14	36.8
Taking street food	32	84.2
Taking fast food	22	57.9
Taking tea/coffee	30	78.9
Taking soft drinks	29	76.3
Not taking vegetables	2	5.3
Not taking fruits regularly	17	44.7
Use OCP	11	28.9
Use NSAID	9	23.7

Table V shows different dietary and other factors in CD with their frequency and percentage in the study population (cases)

Table V. Dietary and other factors in CD with their frequency and percentage (n= 44)

	Frequency (n)	Percentage (%)
Consuming unpasteurized mild	23	52.3
Taking street food	32	72.7
Taking fast food	24	54.5
Taking tea/coffee	34	77.3
Taking soft drinks	31	70.5
Not taking vegetables	10	22.7
Not taking fruits regularly	16	36.4
Use OCP	10	22.7
Use NSAID	7	15.9

Table VI shows association between lifestyle factors and risk of ulcerative colitis. Here smoking shows significant association (OR 20.31; 95% CI 2.39 to 172). In univariate analysis, living abroad showed association (OR 3.99; 95% CI 0.9 to 17.66) but after adjustment, no association was found. Family history didn't show any association.

Table VI. Lifestyle factors and risk of UC

	Crude			Adjusted		
	OR	95%CI	p-value	OR	95%CI	p-value
Smoker	4.81	1.78-12.95	0.001	20.31	2.39-172	0.006
Family history of IBD			0.098			
Living abroad	3.99	0.90-17.66	0.108			

Table VII shows significant association between smoking and crohn's disease (OR 10.30; 95% CI 1.15 to 91.9). Living abroad showed association in univariate analysis (OR 4.98; 95% CI 1.21 to 20.36) but failed to show association after adjustment. Alcohol and family history didn't show any association.

Table VII. Lifestyle factors and risk of CD

	Crude			Adjusted		
	OR	95%CI	p-value	OR	95%CI	p-value
Smoker	3.87	1.46-10.28	0.004	10.30	1.15-91.9	0.037
Alcoholic			0.349			
Family history of IBD			0.004			
Living abroad	4.98	1.21-20.36	0.032			

Table VIII shows not boiling water before drinking (OR 7.33; 95% CI 1.62 to 33.05), bathing in open water (OR 5.04; 95% CI 1.04 to 24.40) and walking bare footed (OR 10.49; 95%CI 2.08 to 52.78) have significant association with ulcerative colitis. Most of the other factors showed associations on univariate analysis but failed to show after adjustment.

Table VIII. Hygienic factors and risk of UC

	Crude			Adjusted		
	OR	95%CI	p-value	OR	95%CI	p-value
Not taking Anti-helminthic	0.89	0.39-2.06	0.797			
Drinking non safe water	2.18	0.13-35.96	0.535			
Not boiling water before drinking	3.49	1.56-7.80	0.002	7.33	1.62-33.05	0.009
Washing with unsafe water	1.81	0.45-7.16	0.462			
Not washing hand before meal	1.08	0.49-2.35	0.847			
Not washing hand after using toilet	1.73	0.55-5.40	0.338			
Bathing in open water	13.28	4.30-40.99	<0.001	5.04	1.04-24.40	0.044
Using non hygiene toilet	1.08	0.09-12.30	1.000			
Walking bare footed on toilet and ground	12.72	4.47-36.21	<0.001	10.49	2.08-52.78	0.004

Table IX shows not boiling water before drinking (OR 10.33; 95% CI 2.54 to 43.51) and bathing in open water (OR 6.48; 95% CI 1.35 to 31.09) have significant association with crohn's disease. Most of the other factors showed associations on univariate analysis but failed to show after adjustment.

Table IX. Hygienic factors and risk of CD

	Crude			Adjusted		
	OR	95%CI	p-value	OR	95%CI	p-value
Not taking Anti-helminthic	0.88	0.40-1.95	0.766			
Drinking non safe water	1.88	0.11-30.86	1.000			
Not boiling water before drinking	3.56	1.65-7.68	0.001	10.33	2.54-43.51	0.001
Washing with unsafe water	3.96	1.23-12.68	0.015			
Not washing hand before meal	0.76	0.35-1.64	0.498			
Not washing hand after using toilet	1.46	0.47-4.51	0.558			
Bathing in open water	8.25	3.28-20.75	<0.001	6.48	1.35-31.09	0.019
Using non hygiene toilet	1.90	0.25-14.00	0.611			
Walking bare footed on toilet and ground	6.55	2.83-15.18	<0.001			

Table X shows exposure to pets such as cat, dog, birds have significant association with ulcerative colitis (OR 11.24; 95% CI 1.86 to 67.76). Exposure to domestic animals (cow, goat) shows association on univariate analysis but failed to show after adjustment. Other factors didn't show any association.

Table X. Childhood factors and risk of UC

	Crude			Adjusted		
	OR	95%CI	p-value	OR	95%CI	p-value
No breast feeding	0.09	0.01-0.74	0.006			
No exclusive breast feeding	0.26	0.11-0.63	0.002			
Bottle feeding	0.107	0.04-0.25	<0.001			
Exposure to pets	3.95	1.69-9.20	0.001	11.24	1.86-67.76	0.008
Exposure to domestic animals	5.03	2.05-12.31	<0.001			

Table XI shows exposure to pets such as cat, dog, birds have significant association with crohn's disease (OR 19.19; 95% CI 1.74 to 211). Exposure to domestic animals (cow, goat) shows association on univariate analysis but failed to show after adjustment. Other factors didn't show any association.

Table XI. Childhood factors and risk of CD

	Crude			Adjusted		
	OR	95%CI	p-value	OR	95%CI	p-value
No breast feeding	0.56	0.20-1.53	0.257			
No exclusive breast feeding	0.54	0.25-1.14	0.108			
Bottle feeding	0.122	0.05-0.28	<0.001			
Exposure to pets	4.23	1.88-9.53	<0.001	19.19	1.74-211	0.016
Exposure to domestic animals	2.13	1.00-4.50	0.046			

Table XII shows among the dietary factors taking street food (OR 5.17; 95% CI 1.15 to 23.28) and taking soft drinks (OR 11.55; 95%CI .24 to 9.48) have significant association with ulcerative colitis. Consuming unpasteurized milk shows association on univariate analysis but failed to show after adjustment. Other factors did not show any association.

Table XII. Dietary factors and risk of UC

	Crude			Adjusted		
	OR	95%CI	p-value	OR	95%CI	p-value
Consuming unpasteurized milk	3.76	1.50-9.40	0.007			
Taking street food	7.16	2.70-18.99	<0.001	5.17	1.15-23.28	0.032
Taking fast food	1.75	0.80-3.82	0.154			
Taking tea/coffee	2.52	1.03-6.18	0.039			
Taking soft drinks	4.78	2.00-11.40	<0.001	11.55	0.24-9.48	0.007
Not taking vegetables	0.35	0.07-1.70	0.232			
Not taking fruits regularly	0.69	0.32-1.51	0.363			

Table XIII shows among the dietary factors consuming unpasteurized milk (OR 8.50; 95% CI 1.71 to 42.10) and taking soft drinks (OR 42.74; 95%CI 5.56 to 328) have significant association with Crohn's disease. Taking street food shows association on univariate analysis but failed to show after adjustment. Other factors did not show any association.

Table XIII. Dietary factors and risk of CD

	Crude			Adjusted		
	OR	95%CI	p-value	OR	95%CI	p-value
Consuming unpasteurized milk	7.06	2.96-16.83	<0.001	8.50	1.71-42.10	0.009
Taking street food	3.58	1.61-7.92	0.001			
Taking fast food	1.53	0.73-3.20	0.254			
Taking tea/coffee	2.29	0.99-5.26	0.048			
Taking soft drinks	3.54	1.61-7.75	0.001	42.74	5.56-328	<0.001
Not taking vegetables	1.89	0.73-4.90	0.181			
Not taking fruits regularly	0.49	0.23-1.04	0.064			

Table XIV shows use of NSAID have association with ulcerative colitis on univariate analysis but shows no association after adjustment. Other factors show no association.

Table XIV. Dietary factors and risk of CD

	Crude			Adjusted		
	OR	95%CI	p-value	OR	95%CI	p-value
Tonsillectomy			0.016			
Appendisectomy Tuberculosis infection	0.06	0.01-0.60	0.002 <0.01			
Tuberculosis infection (family member)				0.030		
Use of OCP	0.78	0.34-1.81	0.572			
Use of NSAID	2.87	1.01-8.16	0.042			

Table XV shows no association with the above factors and crohn's disease.

Table XV. Medical factors and risk of CD

	Crude	Adjusted				
	OR	95%CI	p-value	OR	95%CI	p-value
Tonsillectomy	0.307	0.06-1.45	0.139			
Appendisectomy	0.74	0.30-1.80	0.517			
Tuberculosis infection			<0.001			
Tuberculosis infection (family member)			0.004			
Use of OCP	0.56	0.24-1.31	0.183			
Use of NSAID	1.75	0.58-5.19	0.309			

DISCUSSION

This case control study was conducted in the Department of Gastroenterology, BSMMU. The objective of the study was to evaluate the association between environmental risk factors and IBD. Physician diagnosed IBD patients aged more than eighteen years admitted or visiting for follow up in Department of Gastroenterology were the cases. For controls, age and gender matched attendants of patients in Gastroenterology department other than IBD, non-relative to the cases and free from any bowel symptoms were selected. We have selected 82 cases and 82 controls. Among the cases, 38 patients were diagnosed as ulcerative colitis and 44 patients were diagnosed as Crohn's disease.

Among the lifestyle factors, smoking was found to be associated with both UC and CD in this study.[13] In different studies, UC was found to be more common in ex-smokers and non-smokers, this dispersion may be because of that the ex-smokers were included in the smoker group.[42-44] No association was found between alcohol intake and IBD.[45] Though genetic association is found in the development of IBD among family members, we did not find any association between positive family histories of IBD. The likely cause may be the sample size because only 7 cases had positive family history. If sample size was larger, we might find association with positive family history. Living abroad may be associated with IBD because of lifestyle and food habit in different countries but we did not find any association in this study.

Boiling of water is an important hygienic factor specially if not obtained from deep tubewell and most of our urban population use supply water which is contaminated with different organisms.[5] We found strong association between not boiling water before drinking with both UC and CD which may contribute to altered microbiome of gut which

is a unique factor for development of IBD. Most of our population have history of bathing in open water especially in river and pond which can cause swallowing of these contaminated water. We found association between bathing in open water and development of both UC and CD.

Walking bare footed in toilet and ground is a potential cause of acquiring helminthic infection and helminthic infestation is thought to be an important cause of development of IBD[46]. In our study, we found association between walking bare footed and development of UC but we did not find association with CD which was expected. Other hygienic factors such as drinking unsafe water, not taking antihelminthic regularly, not washing hands with soap before eating and after using toilet and using open toilet was not associated with IBD in this study.

Breast feeding during childhood is an important protective factor for development of IBD in later life. Various similar studies found not taking breast milk or taking for shorter duration in childhood to be associated with development of IBD. But we found no association among these, the cause of which may be the respondents might fail to give appropriate history of their breast-feeding history rather if we could take history from their parents regarding this, results might be different.

Presence of household pets such as cats, dogs, and birds is an important risk of acquiring communicable infections which can spread through close contacts which may modulate the immune system and subsequent development of IBD. In this study we found strong association between presence of household pets and development of IBD. We found no association between domestic animals such as cow, goat, buffalo, and development of IBD.

Consuming street food is a risk factor for various gastrointestinal tract infection transmitted by feco oral route and translocation of various organisms in the gut. This may be associated with development of IBD. In this study, we found significant association between consuming street food and UC but not with CD. Consuming unpasteurized milk may cause translocation of bacteria in the gut and subsequent development of IBD and in our study we found association with CD but not with UC. Diet containing high refined sugar is a known risk factor for the development of IBD. In this study we found significant association between soft drinks containing high sugar and development of both UC and CD. Other dietary factors such as consuming fast food, tea or coffee, not consuming vegetables or fruits were not associated with IBD in this study.

Drug history such as contraceptive pill intake is associated with IBD in several studies, but we found no association in this study. The cause of finding no association may be the number of female respondents which was smaller. Use of NSAID was thought to be associated with IBD, but we found no associations may be due to small number of cases. Association between tonsillectomy, appendisectomy and tuberculosis infection was investigated but we found no association.

LIMITATION

- The sample size of the study was small.
- All patients were collected from a single tertiary level hospital which does not reflect the whole country.
- Questions regarding early lifetime factors are likely to be subjected to recall bias.

CONCLUSIONS

In this study, smoker, exposure to pets, un-boiled water drinking, bathing in open water such as river and ponds, walking bare footed in grounds and toilet, taking street food and soft drinks increased the odds ratio (OR) for ulcerative colitis. On the other hand, being smoker, exposure to pets, un-boiled water drinking drinking, bathing in open water such as river and ponds, consuming unpasteurized milk and soft drinks increased the odds ratio (OR) for crohn's disease. Further large scale and multi-centered study may be carried out to overcome this problem.

Conflict of Interest

This study was funded by the Bangabandhu Sheikh Mujib Medical University (BSMMU), Bangladesh.

REFERENCE

1. Ponder A, Long MD. A clinical review of recent findings in the epidemiology of inflammatory bowel disease. Clin Epidemiol. 2013;5:237-247. doi:10.2147/CLEP.S33961
2. Sood A, Midha V, Sood N, Bhatia AS, Avasthi G. Incidence and prevalence of ulcerative colitis in Punjab, North India. Gut. 2003;52(11):1587-1590. doi:10.1136/gut.52.11.1587

3. Molodecky NA, Soon IS, Rabi DM, et al. Increasing incidence and prevalence of the inflammatory bowel diseases with time, based on systematic review. Gastroenterology. 2012;142(1):46-e30. doi:10.1053/j.gastro.2011.10.001
4. Jostins, L., Ripke, S., Weersma, R. et al. Host–microbe interactions have shaped the genetic architecture of inflammatory bowel disease. Nature 491, 119–124 (2012). Doi: org/10.1038/nature 11582
5. Ng SC, Tang W, Leong RW, et al. Environmental risk factors in inflammatory bowel disease: a population-based case-control study in Asia-Pacific. Gut. 2015;64(7):1063-1071. doi:10.1136/gutjnl-2014-307410
6. Alam MN, Islam N, Shamsuddin M. Ulcerative colitis in Bangladesh. Bangladesh Med Res Counc Bull. 1975;1(2):103-109.
7. Danese S, Fiocchi C. Etiopathogenesis of inflammatory bowel diseases. World J Gastroenterol. 2006;12(30):4807-4812. doi:10.3748/wjg.v12.i30.4807
8. Peeters M, Cortot A, Vermeire S, Colombel JF. Familial and sporadic inflammatory bowel disease: different entities?. Inflamm Bowel Dis. 2000;6(4): 314-320. doi:10.1002/ibd.3780060409
9. Kornbluth A, Sachar DB; Practice Parameters Committee of the American College of Gastroenterology. Ulcerative colitis practice guidelines in adults: American College Of Gastroenterology, Practice Parameters Committee [published correction appears in Am J Gastroenterol. 2010 Mar;105(3): 500]. Am J Gastroenterol. 2010;105(3):501-524. doi:10. 1038/ajg.2009.727
10. Penman, D, and Lees, W. Alimentary tract and pancreatic disease. Davidson's Principle and practice of medicine. London, Churchill Livingstone Elsevier, 2014. https://basicmedicalkey.com/alimentary- tract-and-pancreatic-disease/
11. Langan RC, Gotsch PB, Krafczyk MA, Skillinge DD. Ulcerative colitis: diagnosis and treatment [published correction appears in Am Fam Physician. 2008 Apr 15;77(8):1079]. Am Fam Physician. 2007;76(9): 1323-1330.
12. Kornbluth A, Sachar DB; Practice Parameters Committee of the American College of Gastroenterology. Ulcerative colitis practice guidelines in adults (update): American College of Gastroenterology, Practice Parameters Committee. Am J Gastroenterol. 2004;99(7):1371-1385. doi:10.1111/j. 1572-0241.2004.40036.x
13. Thia KT, Loftus EV Jr, Sandborn WJ, Yang SK. An update on the epidemiology of inflammatory bowel disease in Asia. Am J Gastroenterol. 2008;103(12): 3167-3182. doi:10.1111/j. 1572-0241. 2008.02158.x
14. Danovitch SH. Fulminant colitis and toxic megacolon. Gastroenterol Clin North Am. 1989; 18(1):73-82.
15. Bernstein CN, Wajda A, Blanchard JF. The incidence of arterial thromboembolic diseases in inflammatory bowel disease: a population-based study. Clin Gastroenterol Hepatol. 2008;6(1):41-45. doi:10.1016/j.cgh.2007.09.016
16. Bernstein CN, Blanchard JF, Rawsthorne P, Yu N. The prevalence of extraintestinal diseases in inflammatory bowel disease: a population-based study. Am J Gastroenterol.2001;96(4):1116-1122. doi:10.1111/j.1572-0241. 2001.03756.x
17. Palm Ø, Moum B, Jahnsen J, Gran JT. The prevalence and incidence of peripheral arthritis in patients with inflammatory bowel disease, a prospective population-based study (the IBSEN study). Rheumatology (Oxford). 2001;40(11):1256-1261. doi:10.1093/ rheumatology/40.11.1256
18. Sands BE. From symptom to diagnosis: clinical distinctions among various forms of intestinal inflammation. Gastroenterology. 2004;126(6):1518-1532. doi:10.1053/j.gastro.2004.02.072
19. Podolsky DK. Inflammatory bowel disease. N Engl J Med. 2002;347(6):417-429. doi:10.1056/NEJM ra020831
20. Fiocchi C. Inflammatory bowel disease: etiology and pathogenesis. Gastroenterology. 1998;115(1): 182-205. doi:10.1016/s0016-5085 (98)70381-6
21. Truelove SC, witts LJ. Cortisone in ulcerative colitis; final report on a therapeutic trial. Br Med J. 1955;2(4947):1041-1048. doi:10.1136/bmj. 2.4947.1041

22. Harvey RF, Bradshaw JM. A simple index of Crohn's-disease activity. Lancet. 1980;1(8167):514. doi:10.1016/s0140-6736(80)92767-1

23. Simpson P, Papadakis KA. Endoscopic evaluation of patients with inflammatory bowel disease. Inflamm Bowel Dis. 2008;14(9):1287-1297. doi:10.1002/ibd.20398

24. Leighton JA, Shen B, Baron TH, et al. ASGE guideline: endoscopy in the diagnosis and treatment of inflammatory bowel disease. Gastrointest Endosc. 2006;63(4):558-565. doi:10.1016/j.gie.2006.02.005

25. Fefferman DS, Farrell RJ. Endoscopy in inflammatory bowel disease: indications, surveillance, and use in clinical practice. Clin Gastroenterol Hepatol. 2005;3(1):11-24. doi:10.1016/s1542-3565(04)00441-0

26. Robert ME, Skacel M, Ullman T, Bernstein CN, Easley K, Goldblum JR. Patterns of colonic involvement at initial presentation in ulcerative colitis: a retrospective study of 46 newly diagnosed cases. Am J Clin Pathol. 2004;122(1):94-99. doi:10.1309/XLXK-J84C-3JCW-3RCH

27. D'Haens G, Geboes K, Peeters M, Baert F, Ectors N, Rutgeerts P. Patchy cecal inflammation associated with distal ulcerative colitis: a prospective endoscopic study. Am J Gastroenterol. 1997;92(8):1275-1279.

28. Dundas SA, Dutton J, Skipworth P. Reliability of rectal biopsy in distinguishing between chronic inflammatory bowel disease and acute self-limiting colitis. Histopathology. 1997;31(1):60-66. doi:10.1046/j.1365-2559.1997.5810818.x

29. Villanacci V, Reggiani-Bonetti L, Salviato T, et al. Histopathology of IBD Colitis. A practical approach from the pathologists of the Italian Group for the study of the gastrointestinal tract (GIPAD). Pathologica. 2021;113(1):39-53. doi:10.32074/1591-951X-235

30. Ananthakrishnan AN, McGinley EL, Binion DG. Excess hospitalisation burden associated with Clostridium difficile in patients with inflammatory bowel disease. Gut. 2008;57(2):205-210. doi:10.1136/gut.2007.128231

31. Surawicz CM, Belic L. Rectal biopsy helps to distinguish acute self-limited colitis from idiopathic inflammatory bowel disease. Gastroenterology. 1984;86(1):104-113.

32. Nielsen OH, Vainer B, Rask-Madsen J. Non-IBD and noninfectious colitis. Nat Clin Pract Gastroenterol Hepatol. 2008;5(1):28-39. doi:10.1038/ncpgasthep1005

33. Morita N, Toki S, Hirohashi T, et al. Incidence and prevalence of inflammatory bowel disease in Japan: nationwide epidemiological survey during the year 1991. J Gastroenterol. 1995;30 Suppl 8:1-4.

34. Ouyang Q, Tandon R, Goh KL, Ooi CJ, Ogata H, Fiocchi C. The emergence of inflammatory bowel disease in the Asian Pacific region. Curr Opin Gastroenterol. 2005;21(4):408-413.

35. Yao T, Matsui T, Hiwatashi N. Crohn's disease in Japan: diagnostic criteria and epidemiology. Dis Colon Rectum. 2000;43(10 Suppl):S85-S93. doi:10.1007/BF02237231

36. Lakatos PL. Recent trends in the epidemiology of inflammatory bowel diseases: up or down?. World J Gastroenterol. 2006;12(38):6102-6108. doi:10.3748/wjg.v12.i38.6102

37. Makharia GK. Rising incidence and prevalence of Crohn's disease in Asia: is it apparent or real?. J Gastroenterol Hepatol. 2006;21(6):929-931. doi:10.1111/j.1440-1746.2006.04471.x

38. Leong RW, Lau JY, Sung JJ. The epidemiology and phenotype of Crohn's disease in the Chinese population. Inflamm Bowel Dis. 2004;10(5):646-651. doi:10.1097/00054725-200409000-00022

39. de Boer AG, Sprangers MA, Bartelsman JF, de Haes HC. Predictors of health care utilization in patients with inflammatory bowel disease: a longitudinal study. Eur J Gastroenterol Hepatol. 1998;10(9):783-789. doi:10.1097/00042737-199809000-00010

40. Longobardi T, Jacobs P, Wu L, Bernstein CN. Work losses related to inflammatory bowel disease in Canada: results from a National Population Health Survey. Am J Gastroenterol. 2003;98(4):844-849. doi:10.1111/j.1572-0241.2003.07378.x

41. Feagan BG, Vreeland MG, Larson LR, Bala MV. Annual cost of care for Crohn's disease: a payor perspective. Am J Gastroenterol. 2000;95(8): 1955-1960. doi:10.1111/j.1572-0241.2000.02261.x

42. Bastida G, Beltrán B. Ulcerative colitis in smokers, non-smokers and ex-smokers. World J Gastroenterol. 2011;17(22):2740-2747. doi:10.3748/wjg.v17.i22.2740

43. Chen, BC., Weng, MT., Chang, CH. et al. Effect of smoking on the development and outcomes of inflammatory bowel disease in Taiwan: a hospital-based cohort study. Sci Rep 12, 7665 (2022). https://doi.org/10.1038/s41598-022-11860-y

44. Chong C, Rahman A, Loonat K, et al. Current smoking habits in British IBD patients in the age of e-cigarettes. BMJ Open Gastro 2019;6:e000309. doi:10.1136/bmjgast-2019-000309

45. Piovezani Ramos G, Kane S. Alcohol Use in Patients With Inflammatory Bowel Disease. Gastroenterol Hepatol (N Y). 2021;17(5):211-225.

46. Rahimi, B.A., Mahboobi, B.A., Wafa, M.H. et al. Prevalence and associated risk factors of soil-transmitted helminth infections in Kandahar, Afghanistan. BMC Infect Dis 22, 361 (2022). https://doi.org/10.1186/s12879-022-07336-z

Bangladesh Med J. 2022 May; 51(2)
DOI: https://doi.org/10.3329/bmj.v51i2.68355

Original Article

Clinical Manifestation of Acute Myocardial Infarction in Elderly Patients

* Hossain ML[1], Ullah AZMA[2], Rahman MM[3], Ali MH[4], Hasan R[5], Amit MNH[6], Talukder KC[7]

Abstract

Myocardial Infarction is one of the most common causes of mortality and morbidity among the elderly patients. It is known as wide range of clinical presentations other than chest pain. A large number of patients may have atypical or no symptoms. As an indication of a cardiac problem, resulting in a delay in seeking medical care, the absence of typical chest pain and the vagueness of symptoms might not be recognized. This cross sectional descriptive study was carried out among 50 patients more than 60 years of old irrespective of sex with acute myocardial infarction in the Department of Medicine and Coronary Care Unit (CCU) of Dhaka Medical College Hospital, Dhaka, from January to July 2018. Ethical clearance was obtained from the Ethical Review Committee (ERC) of Dhaka Medical College (DMC) and verbal with written consent was obtain from the patients. History of illness were taken and physical examination were done in a predesigned data collection sheet. Then required investigation like Electrocardiography (ECG), cardiac enzymes and relevant laboratory investigations were done. After collecting all available information statistical analysis was done using statistical package for the social sciences (SPSS) of windows version 20. Result of this study was expressed as frequency, percentage, mean (±SD), range, p-value. Among the 50 patients majority of them (58%) were male and more than one-fourth (28%) of patients were diagnosed as having Acute Myocardial Infection (AMI) and their presentation was also atypical in the hospital. Half (50%) of the atypically presenting AMI patients were in age group 60-69 years. More than one-fourth (28%) of patients had no complaints of chest pain, out of which, both dyspnea + epigastric pain were found in equal number of patients 28.6% + 28.6% patients. Atypical presentation was found in more than one-third (38.1%) of elderly female patients and more than one-fifth (20.7%) in male patients (p=0.002). Regarding risk factors, hypertension in 66%, diabetes mellitus in 64% and hypercholesterolemia in 56% were found in this study. More than one-fourth (28%) of patients were smoker. More than one-fourth (26%) of patients of diabetes mellitus presented with atypical symptoms among atypical group (p=0.008). Most of the patients (78%) with atypical symptoms presented more than 12 hours lately compared to patients with typical symptom. Mortality rate was higher (42.3%) among the patient presented with atypical symptoms than the patients presented with typical chest pain (27.7%). More than one-fourth (28%) of patients with atypical chest pain was found to have inferior MI and mortality was highest among those with inferior MI and patients had atypical symptoms. This study found that even though chest pain was the most common presentation in elderly AMI patients, they were also found to have atypical presentations like dyspnea, vomiting, sweating and epigastric pain. This signifies the need of examining physicians to meticulously identify AMI in elderly for successful and immediate treatment. Immediate and accurate diagnosis of Acute Coronary Syndrome (ACS) could reduce mortality and morbidity.

Keyword: *Acute myocardial infarction, mortality and morbidity, elderly patients*

1 *Dr. Md. Liakat Hossain, Medical Officer, Department of Medicine, Dhaka Medical College Hospital (DMCH), Dhaka, Bangladesh,Email : liakath430@gmail.com
2 Dr. A.Z.M Ahsan Ullah, Consultant, Department of Cardiology, Colonel Malek Medical College Hospital, Manikganj, Bangladesh
3 Dr. Mohammad Mizanur Rahman, Medical Officer, DMCH, Dhaka, Bangladesh.
4 Dr. Md. Haidar Ali, Consultant (Medicine), Upazilla Health Complex, Delduar, Tangail, Bangladesh
5 Dr. Rashedul Hasan, Assistant Professor, Department of Medicine, Sheikh Hasina Medical College Hospital, Tangail, Bangladesh
6 Dr. Muhammad Nafees Hussain Amit, Medical Officer, Department of Medicine, DMCH, Dhaka, Bangladesh
7 Dr. Kshitish Chandra Talukder, Medical Officer, Department of Medicine, DMCH, Dhaka, Bangladesh
*For Correspondence

INTRODUCTION

Longevity in developing as well as developed countries has improved significantly in recent years. It is estimated that the number of people aged >65 years in 2025 about 1 billion.[1] Bangladesh has life expectancy of 71 years now.[2] Myocardial infarction (MI) remains the leading cause of

hospitalizations as well as the leading cause of death worldwide. The frequency and prevalence of MI increase progressively with age. In the United States, over 60% of acute MIs occur in patients 65 years of age or older, and approximately one third occur in persons over age 75.[3] In patients with acute myocardial infarction (AMI) who are older than 70 years, mortality rates exceed 30%.[4] Both in-hospital and long-term mortality are significantly higher in the elderly, regardless of the type of treatment.[5-6] Chest pain has been reported as the cardinal clinical feature among patients who present with MI.[7] WHO requires the presence of chest pain as one of the cornerstone features in its diagnosis of MI.[8] However, a substantial number of patients may have atypical or no symptoms on initial evaluation.[9] The clinical features of acute MI vary by age in many aspects. The elderly with acute myocardial infarction (AMI) have been reported to present with more atypical symptoms.[10] Atypical presentation is defined as the absence of chest pain before or during admission, and may have included gastrointestinal or respiratory symptoms such as dyspnea, nausea, vomiting, abdominal discomfort or any other symptoms like nonproductive cough, fatigue, syncope, or palpitation, back pain, leg pain, neck pain, weakness etc. The prevalence of this presentation was 8.4% in the Global Registry of Acute Coronary Events (GRACE), 33% in the National Registry of Myocardial Infarction 2 (NRMI-2) and the dominant symptoms in these patients were dyspnea, nausea and syncope.[11] The cases of myocardial ischemia without pain, the so-called asymptomatic or silent ischemia, it is more frequent in elderly patients.[12] Considering patients with acute coronary syndrome, as myocardial infarction with ST-segment elevation, among those under 65 years of age, only 11.1% do not have precordial pain, unlike those over 85 years old, among which 43.2% have precordial pain.[13] Similarly, among elderly patients with Q wave in electrocardiogram (ECG), 78% did not have symptoms of precordial pain.[14] AMI is associated with significantly higher mortality in the elderly compared with the young yet the elderlies are treated less aggressively than the young.[15] The absent or atypical clinical signs in elderly persons hinder the management of coronary atherosclerotic disease. JG. Canto et al., studied that MI patients without chest pain were significantly less likely to receive a timely ECG or reperfusion strategies. For differences in clinical presentation characteristics patients who experienced MI without chest pain had more than a 2-fold increased risk of in-hospital death than MI patients who presented with chest pain, even after adjusting.[10] Apart from diagnostic difficulty of AMI in elderly due to atypical clinical presentation, management of such cases is also challenging. Because of advanced atherosclerotic disease and ventricular dysfunction particularly diastolic dysfunction they may be more refractory to medical therapy possibly. Never the less, they are more intolerant to therapy with multiple anti ischemic agents of management decisions during the first 24 hours. As is true with all age group the greatest effect have on survival in the elderly.[16] Meanwhile elderly patients with AMI differ in clinical presentation than young patients with AMI, this issue needs perfect understanding. It will help us to decrease mortality and morbidity. The purpose of this study is to describe the Risk factors, Clinical features, outcomes in AMI in Elderly (>65 years).

MATERIALS AND METHODS

This cross sectional descriptive study was carried out among 50 patients >60 years of old irrespective of sex with AMI in the Department of Medicine and CCU of Dhaka Medical College Hospital, Dhaka, Bangladesh. Conducted from July to January, 2018. The study included all the patient that fulfilled diagnostic criteria and age >60 years. Diagnostic criteria were included-

A. MI was confirmed by ECG changes and/ or cardiac enzymes

Our criteria for ECG changes were as follows:

I. ST-segment elevation of more than 2 mm.

II. Pathological Q-Wave.

III. Inverted or flattened T-Wave.

The CARDIAC ENZYMES included in the diagnostic criteria were CK-MB [normal: 0-5 ng/ml] and/or Troponin-I [+ve/ >0.4 ng/ml]

B. Our criteria for diagnosis of site of infarction was ECG

All patient with clinical symptom mimicking MI but having no ECG changes and no significantly raised CARDIAC ENZYMES were not included in the study. Patient who fulfilled the inclusion criteria were enrolled in this study. Informed consent was taken from all the cases. Written informed consent was taken from each patient. All patient underwent complete medical assessment after admission to the hospital including collection of demographic information, history and physical examination with vital signs, documentation of etiology of AMI and presenting

clinical symptoms. Blood for laboratory testing (complete blood count, CKMB, Trop-I) were done. Ethical clearance of the study was taken from the ethical committee of Dhaka Medical College. All the data were analyzed by SPSS version 20.0 for windows 7 program. An analysis plan was developed keeping in view with the objectives of the study. Frequency distribution and normal distribution of all continuous variables was calculated.

RESULTS

This study is a cross-sectional follow-up study done over a period of 6 months and 50 elderly patients with the diagnosis of AMI were included in the study and their clinical profile was recorded. Among the 50 respondents, 14 (28%) of respondents were diagnosed as having Acute Myocardial Infection (AMI) and their presentation was also atypical in the hospital.

Table I states the distribution of respondents by age and sex; among the respondents 56% was in age group 60-69 years, 32% was in age group 70-79 years and mean age (±SD) was 69.82±5.6 years. Male female ratio was 1.38:1 and 58% of respondents were males.

Table- I: Distribution of study population by age and sex (N=50).

Age category (in years)	Male (%)	Female (%)
60-69 yrs.	17(34.0)	11(22.0)
70-79 yrs.	10(20.0)	6(12.0)
>80 yrs.	2(4.0)	4(8.0)
Mean Age (±SD)	69.82±5.6	
Male Female ratio	1.38:1	

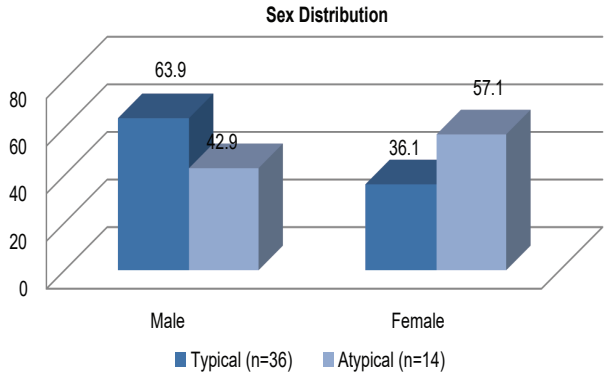


Figure- 1. *Bar chart shows participants by sex distribution (N=50).*

Figure 1 Bar chart shows distribution of respondent's presentation by sex. Atypical presentation was found in 57.1% of female patients and 42.9% in male (p=0.002).

Table II shows the distribution of complaints of patients. Out of the patients with typical chest pain, 28.6% patients had complaints of dyspnea; 14.1% patients of syncope and 7.1% patients of vomiting. Epigastric pain in the absence of chest pain was presented in 28.6% patients.

Table- II: shows the distribution of complaints of patients (n= 14)

Complaints with chest pain	Percentage (%)
Dyspnea	28.6%
Syncope	14.1%
Vomiting	7.1%
Complaints in the absence of chest pain	
Epigastric pain	28.6%

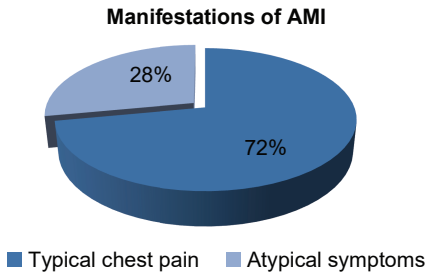


Figure- 2: *Pie chart shows manifestations of AMI among the participants (N=50).*

Figure 2 shows the distribution of respondent's manifestations regarding typical chest pain and atypical symptoms of AMI among them 36 (72%) respondents had typical chest pain and 14 (28%) had atypical symptoms.

Table III states the distribution of atypical symptoms and typical chest pain in various age group; here 58.33%, 30.56% and 11.11% had typical chest pain among the respondents of total typical chest pain (n=36) in the age groups 60-69 years, 70-79 years and >80 years respectively. Atypical symptoms was found in 50.00%, 35.71% and 14.29% among the total respondents who had atypical symptoms (n=14) in the age group of 60-69 years, 70-79 years and >80 years respectively.

Table- III: Presentation according to age (N=50).

Age group	Typical chest pain (n=36)	With atypical symptom (n=14)
60-69 yrs.	21 (58.33%)	7 (50.00%)
70-79 yrs.	11 (30.56%)	5 (35.71%)
>80 yrs.	4 (11.11%)	2 (14.29%)

Table IV illustrates the ECG findings of respondents conducted during hospital admission; Out of 50 respondents 45 showed ECG changes and 12 (24%) respondents had atypical symptoms. NSTEMI in 26% patients and LBBB in 20% patients with atypical symptoms among them 41.6% had ST elevation.

Table- IV: ECG findings of respondents conducted during hospital admission (N=50).

Variables	No. of typical cases	No. of atypical cases	P value
STEMI	17(34.0)	5(10.0)	
NSTEMI	9(18.0)	4(8.0)	0.866
Acute LBBB	7(14.0)	3(6.0)	
Others (No changes found)	3(6.0)	2(4.0)	

Table V states the distribution of commonest risk factors among the respondents both in typical and atypical cases; here, hypertension was found in 66% of the respondents, diabetes mellitus in 64%, hypercholesterolemia in 56% and smoking in 28% of respondents, however 13 (26%) patients having diabetes presented with atypical symptoms (p=0.008,).

Table VI illustrates the distribution of time interval between onsets of symptoms and presentation in hospital. Among the total respondents 38% of them presented to the hospital within 12 hours of onset of symptoms, out of which 84% was with typical chest pain; another 30% presented in the next 12 hours and the remaining presented after 24 hours onset of symptoms. Here, 78% respondents with atypical symptoms presented lately more than 12 hours compared to patients with typical symptom.

Table- VI: Time interval between onsets of symptoms and presentation in hospital. (N=50)

	Typical (n=36)		Atypical (n=14)	
	n	%	n	%
<3 hours	6	85.7	1	14.3
3-12 hours	8	80.0	2	20.0
12-24 hours	16	80.0	4	20.0
>24 hours	6	46.2	7	53.8

Table VII shows the distribution of mortality in patients with typical and atypical presentation of AMI; Mortality rate was among atypical symptoms was 42.3% and 27.7% among the patients presented with typical chest pain.

Table-VII: Mortality in patients with typical and atypical presentation of AMI. (N=50)

Type of presentation	No.	Mortality	%	P value
Atypical presentation	14	6	42.9	0.243
Typical presentation	36	10	27.8	

Table VIII reveals that 28% patient with atypical chest pain was found to have inferior MI and mortality was greater among the patients with inferior MI and atypical symptoms according to duration of delay in arrival at hospital.

Table-VIII: Mortality for inferior MI according to delay of arrival in hospital. (N=50)

Inferior MI	Time			
	< 3 hrs	3-12 hrs	12-24 hrs	>24 hrs
Atypical symptoms	1	2	5	6
Mortality	0	1	3	3

Table- V: Distribution of risk factor profile (N=50)

Risk factors	Manifestation				P value
	Typical (n=36)	Atypical (n=14)	Total (n=50)	%	
Hypertension	21(42.0)	12(24.0)	33	66.0	0.066
Diabetes Mellitus	19(18.0)	13(26.0)	32	64.0	0.008
Smoking	8(16.0)	6(12.0)	14	28.0	0.145
Hypercholesterolemia	18(36.0)	8(16.0)	26	52.0	0.650
Obesity	14(28.0)	7(14.0)	21	42.0	0.475

Table IX shows the mode of presentation and prognosis according to site of infarction. Site of infraction on inferior wall was 5 (35.7%) in atypical patients and 5 (35.7%) in typical patients.

Table- IX: Mode of presentation and prognosis according to site of infarction. (N=50)

Site of infarction	Total cases	Atypical	Typical	Mortality
Anterior wall	15	3 (20.0%)	13	4 (26.7%)
Lateral wall	1	0 (0.0%)	1	0 (0.0%)
Inferior wall	14	5 (35.7%)	9	5 (35.7%)
Ant + Lat	5	1 (20.0%)	3	2 (40.0%)
Ant + Inf + Lat	7	3 (42.9%)	4	2 (28.6%)
Ant + Inf	3	1 (33.3%)	2	1 (33.3%)
Ant + Septal	5	1 (20.0%)	4	2 (40.0%)

DISCUSSION

In present study, amongst the elderly, the sub group of patients who were in majority belonged to 60-69 years. This is in concordance to other studies wherein the number of elderly presenting with AMI decreases as age increases.[19] This is attributed to the comorbid conditions like cognitive problems, renal insufficiency depression and added to it the atypical vague symptoms of AMI with increasing age, forbidding very elderly patients proper access to health care.58% of patients were males in present study, Male: female ratio being 1.38:1. Compared to young females who are hormonally protected against CAD, this indicates an increase in prevalence of disease in elderly females. Similar to present study, Alexander K et al. in their study had identified that with progressively older age, patients with ACS are more likely to be female; from 30% below age 65 to 62% over age 85 years.[19] Thus, gender and CV risk reverses past age 65. Although cardiovascular disease has a greater prevalence in men prior to this age, its prevalence in women exceeds that in men past this age. In a statistical study by the AHA, the prevalence of cardiovascular diseases increased in females as the age increases (male to female ratio: 1.3:1 in 35-44 year's age group compared to 0.89:1 in 75+ age group).[20] Vaccarino V et al. published in their article that by 80 years of age, similar frequencies of symptomatic CAD of about 20 to 30 percent are seen in men and women.[21] Another study wherein the sex ratio is similar to ours is that by Bhatia LC et al, the ratio becoming smaller with increase in age(1.27:1 in elderly as against 3.43:1 in young patients). About 28% of patients with acute myocardial infarction presented with atypical symptoms (without chest pain) on initial evaluation. So, one fourth of elderly MI patients presented with atypical symptoms. According to Worcester Heart Attack Study, chest pain was reported in less than half of the patients over age 75 years (45.5%) while dyspnea or cough (22%) and other symptoms like dizziness, arm numbness, headache, syncope, sweating, palpitations, nausea, weakness(32%) were more common.[22,23] Dyspnea in the elderly MI patient may be due to age-related diastolic dysfunction and associated pulmonary disease and Giddiness likely due to acute reduction in cardiac output in the setting of an aging brain and diminished autonomic responsiveness. Compared to young though exact physiology unknown, changes in pain perception and altered ischemic thresholds may be contributory, elderly patients have atypical pain.[22,23] Patients experiencing MI without chest pain tended to be older (33.4% in age group more than 80 years). In the Reykjavik study, about 30% of myocardial infarction presented with atypical symptoms.[24] Results from other population studies have shown that between 20% and 60% of all MI are presented with atypical symptoms. Study by Holay MP and others was consistent with this.[25] According to study done by John G.Canto and others patients presenting with atypical symptoms were older (mean age 74.2 year'svs 66.9 years).[10] We have documented a pronounced gender difference with males far outnumbering female (38.1% vs 20.7%) in the incidence of atypical presentation (p=0.002).This is similar to the results found in the study conducted by Muller RT et al.[26] In this study, among the risk factors in the elderly, commonest risk factor was hypertension (66%). After hypertension, diabetes was more prevalent in our patients.

Diabetic patients were more likely to be presented with atypical presentation (p=0.002). This supports the Honolulu Hawai Heart program study.[27] in which the patients with atypical symptoms were more likely to be hypertensive and to have diabetes or impaired glucose tolerance but they were less likely to have angina pectoris. A greater prevalence of hypertension and diabetes in the atypical MI group was also noted in Framingham study[28] and study by John G Canto.[10] In present study almost 45% patients had specific ECG changes. NSTEMI in 28% patients and LBBB in 21% patients with atypical symptoms. This is in contrast to various previous studies wherein Non ST-segment elevation MI is the most common form of myocardial infarction in the elderly, accounting for 55% of MIs in patients above age 85 but less than 40% of MIs in patients below age 65. Increased sub endocardial ischemia due to higher prevalence of previous MIs, multi-vessel disease, hypertension, and LVH is the reason behind the increased proportion of NSTEMI in elderly.[29] Also in elderly, the ECG is more likely to be non-diagnostic with baseline abnormalities of ventricular hypertrophy and intraventricular conduction disturbancesin this study a higher percentage of inferior wall MI patients presented with atypical symptoms (35.5%). Honolulu Hawai Heart program study[27] also supports the same thing, of demonstration a distinct increase in painless infarction with inferior wall MI patients (51%). That is, higher proportion of inferior wall MI tends to cause atypical symptoms, such as epigastric pain or abdominal distress which would fail to be recognized as MI. But study by William B.Kennel and othersshowed that there was no difference in the electrocardiographic location of infarct between those with atypical and typical symptoms of MI.[30] In the Framingham study[28] the proportion of atypical MI did not vary with electrocardiographic location of the infarct. Only 38% of patients presented to the hospital within 12 hours of onset of symptoms. Most of the patients with atypical symptoms (78%) presented lately more than 12 hours compared to patients with typical symptoms.This accounted for one of the major reasons for not thrombolysing the patients. Prehospital delays in older adults, might be caused as they have atypical chest pain, decreased cognition, and especially social constraints.[31] In the Global Registry of Acute Coronary Events (GRACE) registry, the median time from symptom onset to presentation was 2.3 hours in those under 45 years, but 3.0 hours over age 85.4 In the Cooperative Cardiovascular Project, one significant determinant of late arrival (>6 hours after symptom onset) was advanced age.[32] Mortality rate in this study was 32%. Patients with atypical MI group showed a higher mortality than did the typical MI group (42.3 %.vs 27.7%) This high percentage of mortality can be attributed to the inadequate usage of thrombolysis in elderly patients in present study. In a comparative study between elderly and young MI, mortality was on higher side in the elderly group.[33] Also in another study, Thirty-day and one-year mortality rates were markedly higher for older patients compared with younger patients.[34] In PURSUIT trial, patients admitted with a first ST-segment elevation myocardial infarction and treated with thrombolytic therapy, in-hospital mortality increases exponentially as a function of age from 1.9 percent among patients age 40 years or younger to 31.9 percent among patients older than age 80 years. In the Framingham studyalso, age adjusted long term mortality for all cases were slightly worse among unrecognized MI cases than among recognized MI.[28]

LIMITATIONS

The first limitation of the study was small sample size with a short period of time. Secondly, the study was a hospital-based study in the capital city. This study did not use anyin-depth analysis.

CONCLUTIONS

The results of this study showed that elderly patients with myocardial ischemia often have atypical clinical manifestations. Identifying the symptoms of ACS is important for successful and immediate treatment. Accurate diagnosis of ACS could reduce mortality and morbidity. In this study, it seems typical symptoms of ACS in older patients are affected by risk factors such as female gender and diabetes.

REFERENCES

1. Goch A, Misiewicz P, Rysz J, Banach M. The clinical manifestation of myocardial infarction in elderly patients. Clinical cardiology. 2009; 32(6).
2. Bangladesh [Internet]. World Health Organization. 2017. Available from: http://www.who.int/countries/bgd/en/.
3. Rich MW. Epidemiology, clinical features, and prognosis of acute myocardial infarction in the elderly. Am J Geriatr Cardiol. 2006; 15:7-11.

4. Devlin W, Cragg D, Jacks M. Comparison of outcome in patients with acute myocardial infarction aged 75 years with that in younger patients. Am J Cardiol. 1995;75: 573-576.

5. Batchelor WB, Anstrom KJ, Muhlbaier LH, Grosswald R, Weintraub WS, O'Neill WW, Peterson ED, National Cardiovascular Network Collaboration. Contemporary outcome trends in the elderly undergoing percutaneous coronary interventions: results in 7,472 octogenarians. Journal of the American College of Cardiology. 2000 Sep 30; 36(3):723-30.

6. DeGeare VS, Stone GW, Grines L. Angiographic and clinical characteristics associated with increased in-hospital mortality in elderly patients with acute myocardial infarction undergoing percutaneous intervention (A pooled analysis of the primary angioplasty in myocardial infarction trials). Am J Cardiol. 2000; 86:30-34.

7. Braunwald E. Heart Disease, Fourth Edition. Philadelphia, Pa: WB Saunders Co; 1992:1214-1215.

8. Kristian Thygesen, Joseph S. Alpert, Allan S. Jaffe, Maarten L. Simoons, Bernard R. Chaitman, Harvey D. White. Third Universal Definition of Myocardial Infarction.J Am Coll Cardiol. 2012;60(16): 1581-1598.

9. Brieger D, Eagle KA, Goodman SG, Steg PG, Budaj A, White K, Montalescot G; GRACE Investigators. Acute coronary syndromes without chest pain, an underdiagnosed and undertreated high-risk group: insights from the Global Registry of Acute Coronary Events. Chest 2004; 126: 461-9.

10. Canto JG, Shlipak MG, Rogers WJ, Malmgren JA, Frederick PD, Lambrew CT, Ornato JP, Barron HV, Kiefe CI. Prevalence, clinical characteristics, and mortality among patients with myocardial infarction presenting without chest pain. JAMA 2000; 283: 3223-9.

11. Hyun Kuk Kim. Atypical Presentation in Patients with Acute Coronary Syndrome. In: Acute Coronary Syndromes. The Heart Center of Chonnam National University Hospital, Gwangju, Korea. February, 2012: Chapter 8.

12. Fleg JL, Gerstenblith G, Zonderman AB, Becker LC, Weisfeldt ML,Costa Jr PT, et al. Prevalence and prognostic significance of exerciseinduced silent myocardial ischemia detected by thallium scintigraphy and electrocardiography in asymptomatic volunteers. Circulation. 1990;81(2): 428-36.

13. Rogers WJ, Bowlby LJ, Chandra NC, French WJ, Gore JM, Lambrew CT, et al. Treatment of myocardial infarction in the United States (1990 to 1993). Observations from the National Registry of Myocardial Infarction. Circulation. 1994;90(4):2103-14.

14. Aronow WS. Prevalence of presenting symptoms of recognized acute myocardial infarction and of unrecognized healed myocardial infarction inelderly patients. Am J Cardiol. 1987;60(14):1182

15. Tresch D.D., Brady W.J., Aufderheide T.P., Lawrence S.W., Williams K.J. Comparison of elderly and younger patients with out-of-hospital chest pain. Clinical characteristics, acute myocardial infarction, therapy and outcomes. Arch Intern Med. 1996; 156:1089–1093.

16. Fibrinolytic Therapy Trialists (FTT) Collaborative Group. Indications for fibrinolytic therapy in suspected acute myocardial infarction: Collaborative overview of early mortality and major morbidity results from all randomized trials of more than 1000 patients. Lancet 1994; 343:31122.

17. A.K. Datta, Essentials of Human Anatomy (Volume 1-3), Edition: 10th, 6th & 5th, Publisher: Current Books International

18. Mozaffarian D, Roger VL, Benjamin EJ, Berry JD, Blaha MJ, et al. American Heart Association Statistics Committee and Stroke Statistics Subcommittee. Heart disease and stroke statistics - 2014 update: a report from the American Heart Association. Circulation. 2014: published online December 18, 2013, 10.1161/01

19. Alexander K, Roe MT, Kulkarni SP. Evolution of cardiovascular care for elderly patients with non-ST-segment elevation acute coronary syndromes: Results from CRUSADE. J Am Coll Cardiol. 2005; 46:1490-5.

20. Mikkola TS, Gissler M, Merikukka M, Tuomikoski P, Ylikorkala O. Sex differences in age-related

cardiovascular mortality. PLoS One. 2013; 8 (5): e63347.

21. Vaccarino V, Rathore SS, Wenger NK, Frederick PD, Abramson JL, Barron HV, et al. National Registry of Myocardial Infarction Investigators: Sexand racial differences in the management of acute myocardial infarction, 1994 through 2002. N Engl J Med. 2005; 353:671-682.
22. Milner KA, Vaccarino V, Arnold AL, Funk M, Goldberg RJ (2004). Gender and age differences in chief complaints of acute myocardial infarction (Worcester Heart Attack Study). Am J Cardiol, 93:606-608
23. Ochiai ME, Lopes NH, Buzo CG, Pierri H. Atypical manifestation of myocardial ischemia in the elderly. Arq Bra Cardiol. 2014; 102(3):31-33.
24. Emil Sigurdsson, Gudmundur Thorgeirsson, Helgi Sigvaldason and Nikulas Sigfusson. Unrecognized myocardial infarction Epidemiology, clinical characteristic, and the prognostic role of angina pectoris. (The Reykjavik study) Ann Intern Med. 1995; 122:96-102.
25. Holay MP, Janbandhu A, Javahirani A, Pandharipande MS, Suryawanshi SD. Clinical profile of acute myocardial infarction in elderly (prospective study). JAPI 2007; 55: 188-192.
26. Amelia Carro and Juan Carlos Kaski. Myocardial Infarction in the Elderly. Aging Dis. 2011; 2(2): 116-137.
27. Katsuhiko Yano and Machean CJ. The incidence and prognosis of unrecognized myocardial infarction in the Honolulo, Hawai Heart Programe.Ann Intern Med. 1989; 149:1528-1532.
28. Stuart E Sheifer, MD; Bernard J Gersh, MB; N.David Yanez, PhD; Philip A Ades, MD; Gregory L Burke, MD, Teri A Manolio, MD. Prevalence, predisposing factors, and prognosis of clinically unrecognized myocardial infarction in the elderly. J Am Coll Cardiol. 2000;35(1):119-126.
29. Avezum A, Makdisse M, Spencer F, Gore JM, Fox KA, Montalescot G, et al. (2005). Impact of age on management and outcome of acute coronary syndrome: observations from the Global Registry of Acute Coronary Events (GRACE). Am Heart J, 149:67-73.
30. Sheifer SE, Manolio TA, Gersh BJ. Unrecognized myocardial infarction. Ann Intern Med 2001; 135: 801-811.
31. Goldberg RJ, Yarzebski J, Lessard D, Gore JM (2000). Decade-long trends and factors associated with time to hospital presentation in patients with acute myocardial infarction: The Worcester Heart Attack Study. Arch Intern Med, 160:3217-3223.
32. Saczynski JS, Yarzebski J, Lessard D, Spencer FA, Gurwitz JH, Gore JM, et al. (2008). Trends in prehospital delay in patients with acute myocardial infarction (from the Worcester Heart Attack Study). Am J Cardiol 102(12):1589-94.
33. Bhatia LC, Naik RH. Clinical profile of acute myocardial infarction in elderly patients. J Cardiovasc Dis Res. 2013; 4:107-111.
34. Limacher M. Clinical features of coronary heart disease in the elderly. Cardiovasc Clin. 992;22(2): 63-73.

Bangladesh Med J. 2022 May; 51(2)
DOI: https://doi.org/10.3329/bmj.v51i2.69260

Original Article

Efficacy, Safety, and Acceptability of Manual Vacuum Aspiration with Para Cervical Block as a Management of Incomplete Abortion

* Yeasmin S[1], Sultana S[2], Nahar S[3]

Abstract

Limited access to safe abortion is a leading cause of maternal mortality and morbidity in the developing world, overwhelming hospitals with a large number of women seeking treatment for complications of unsafe abortion. In many cases, more than half of all gynecological admissions are due to incomplete or septic abortions. The primary aims were to assess the efficacy and cost-effectiveness of the manual vacuum aspiration (MVA) procedure for managing incomplete abortion, considering completeness, procedure, duration, and hemorrhage. Additionally, safety aspects, such as complications (hemorrhage, perforation, and cervical injury), pain relief, patient satisfaction, and factors like reduced hospital stays and waiting times, were evaluated. This descriptive cross-sectional study was conducted at Dhaka Medical College and Hospital, focusing on women with incomplete abortions up to 12 weeks of gestation. It took place over six months from July to December 2013, with a purposive sample of 100 cases selected based on specific criteria to represent the study's objectives. Statistical analysis was done by using SPSS (version 16.0, SPSS Inc., Chicago, Illinois, USA). Out of 100 respondents, more than two-third of the patients (68%) were in 21-30 years age group. Half of the patients (50%) came from lower middle class family and most of them were housewives (80%). Majority (58%) of the patients had average gestational age 6-10 weeks. More than two-third (70%) of the patients had incomplete abortion, with 47% having attempted to terminate pregnancy. Abdominal pain was reported among 64% of patients, and the average bleeding period was 5-7 days for 62% of them. More than two-third (68%) of patients had no palpable uterus, and active bleeding was also found among two-third 66.0% of cases. Nearly one-third of the patients (32%) received injectable oxytocin and 13% received blood transfusion. Method of para-cervical block was applied for pain management in all patients (100%), while pethidine was used in only 3% of cases. Almost all of the patients 97%) were given sedatives (diazepam) and oral non-steroidal anti-inflammatory drugs (NSAIDs). Duration for the procedure was 10-15 minutes for 46% of patients, and excessive hemorrhage was found in 2% of cases. The average hospital stay ranged from 2-11 hours. Treatment cost in the majority of cases was only 75-150 Bangladeshi taka (BDT), which was statistically significant. The MVA with paracervical block was found to be efficient for treatment of incomplete abortions during the first trimester of pregnancy, with few complications. MVA procedure had less blood loss, less time consuming, safe and effective with shorter hospital stay.

Keyword: *Efficacy, safety, acceptability, manual vacuum aspiration, para cervical block, incomplete abortion.*

1 * Dr. Sabina Yeasmin, Department of Gynecology and Obstetrics, Junior Consultant, OCC, DMCH. E-mail: sabinaye20@gmail.com

2 Dr. Sohana Sultana, Department of Gynecology and Obstetrics, Assistant Surgeon, 250 Bed, General Hospital, Munshiganj.

3 Dr. Sabikun Nahar, Medical Officer, Department of Gynecology and Obstetrics, Sheikh Hasina National Burn & Plastic Surgery Institute (SHNBPSI), Dhaka

*For Correspondence

INTRODUCTION

Early pregnancy loss is a common experience for women and approximately one in four women experienced a miscarriage in her lifetime.[1] Abortion may be defined as the loss of product of conception in part or completely with or without a fetus weighing less than 500gm before the viable age which is usually 20 wks.[2] In Bangladesh the time limit is still 28th weeks as the facilities for neonatal resuscitation has not yet been developed as much as to the level at which a preterm baby before 28 weeks can survive. More than 50 percent of human pregnancies may be lost, although only about 15 percent cases is perceived as miscarriage, with lower abdominal cramps and uterine bleeding.[3] The incidence of abortion is difficult to work out and some women abort without knowing that they have been pregnant. Most probably 15 percent of clinically and 60 percent of chemically evident pregnancies end in spontaneous abortion.[4] Eighty percent abortions occur prior to 12th weeks, 20-30 percent in the 2nd trimester and

25 percent of women will have one or more miscarriage in her reproductive life.[3,5] According to duration, abortion may be typed as early abortion that occurs before 12 weeks of pregnancy and late abortion that occurs after 12 weeks of pregnancy The most common time for clinically evident abortion to occur is between 7 to 13 weeks.

In first-trimester surgical evacuation of abortion is performed by using one of two methods: vacuum aspiration or sharp curettage (also known as D & C). Vacuum aspiration uses an electric pump or manual aspirator to create a vacuum and the uterine contents are removed through a canula.[6] Vacuum aspiration is the most common method used in developed countries. Pain management during MVA procedure is essential; this includes verbal reassurance, respectful and supportive care during procedure, and some oral medication for relieve from pain such as paracetamol or ibuprofen and para cervical block. The term para cervical block refers to the injection of local anesthesia into the cervix. It is recommended for most women undergoing an MVA procedure. Vacuum aspiration is used for about 97 percent of first trimester abortion in the United States, Canada, China, New Zealand, Singapore and other countries use vacuum aspiration for almost all first trimester surgical abortions.[7] In sharp curettage method, the uterine lining is scraped with a metal curette, often while the patient is under general anesthesia or heavy sedation. Medical experts do not recommend using sharp curettage unless vacuum aspiration and medical methods are unavailable, because sharp curettage carries high risks of complications.[8] More than 50 studies had been conducted last 30 years on vacuum aspiration among 400,000 cases or more in over two dozen of countries, where vacuum aspiration was recommended as the safest and effective method for first trimester abortion.[9] Most of the literatures reveal that vacuum aspiration's effectiveness ranges from 87 to 100 percent. In the United State Edwards Creinin research found that MVA for early abortion was >99% effective, in Sweden Hemlin and Moller (2001) found >97 % effective, [9] where in Bangladesh**,** Bhatia et al. (1980) showed MVA for early abortion was > 99% and in India Roy (1974) found >98% effective.[9] In Bangladesh the traditional sharp curettage is still the popular method for evacuation of uterus, but practice of MVA is not uniform in all heaith service facilities. Now Government has taken steps to train different level of services provider to obtain the skill and to establish MVA as an acceptable and routine method with replacing the sharp curettage.

In Bangladesh, abortion is still one of the major cause of maternal morbidity and death due to limited access in safe management of incomplete abortion. In United Sates, Vietnam, South Africa, United Kingdom and other countries MVA has helped to expand women's access to safe and effective abortions. In the developed world, it has been proved that, management of incomplete abortion with the help of MVA is safe, effective, simpler, cost effective and requiring less hospital stay and allow greater privacy than other methods. This management also gives a greater sense of personal control, autonomy and active participation as there is no need of anesthesia. Effective pain management with para cervical block ensures patient's comfort, increase patient's satisfaction and ease the procedure for providers without increasing the cost of anesthesia. So, this study was assessed and evaluated that MVA with para cervical block that offered a highly effective treatment of incomplete abortion with uterine size up to 12 weeks.

MATERIALS AND METHODS

This cross-sectional study was conducted among women of incomplete abortion up to 12th week and was admitted in the Department of Obstetrics and Gynecology of Dhaka Medical College and Hospital, Dhaka, Bangladesh. The study period was from July to December 2013. Among the women, 100 cases were selected purposively according to inclusion and exclusion criteria. The inclusion criteria of the study were women of incomplete abortion, uterine size within 12th weeks, and women agreeing to participate in this study. On the other hand, the exclusion criteria were women with missed abortion, molar pregnancy, induced abortion with sepsis and suffering from any associated medical diseases. Per abdominal and per-vaginal examination findings, required resuscitation, sedation/ analgesics, amount of bleeding, duration of procedure, anesthesia needed, complications, hospital stay and cost were considered as main outcome variables. After proper enrolment, history and physical examination were done to confirm the diagnosis, then vital signs and haemodynamic stability, duration of gestation, uterine size with status of dilatation of OS were assessed. All patients were properly counselled for para cervical block and procedure of MVA**.** Data was collected using a structured questionnaire containing all the variables of interest. The questionnaire was finalized following pre-testing. All women were informed about the prospect and procedure of the study and informed written consent was taken from all the study subjects after full explanation of nature and purpose of the study. Data were collected by interviewing and examining the patients admitted at DMCH.

Data analysis and quality assurance

Statistical analyses were carried out by using the Statistical Package for Social Sciences version 16.0 for Windows (SPSS Inc., Chicago, Illinois, USA). The mean values were calculated for continuous variables. The quantitative observations were indicated by frequencies and percentages. It is extremely important that data was of good quality. Patient of incomplete abortion was the target group (within 12 weeks)

Ethical Implications

Permission for the study was taken from the concerned departments. All the study subjects were thoroughly appraised about the nature, purpose and implications of the study, as well as spectrum of benefits and risk of the study. All study subjects was assured of adequate treatment of any risk developed in relation to study purpose. Subjects will also be assured about their confidentiality and freedom to withdraw themselves from the study any time. Data was collected in approved data collection form. Finally written consent of all study subjects were taken free of duress and without exploiting any weakness of subjects. The study subjects were informed verbally about the study design, the purpose of the study, and their right to withdraw them from the study at any time, for any reason, whatsoever. Subjects who will give informed consent to participate in the study were included as study sample.

RESULTS

Table I Shows age distribution of patients, here 56.0% belonged to 21-30 years, 20% was 31-40 years, 16% was ≤ 20 years and 8.0% patients belonged to more than 40 yrs.

Table- I: Age distribution of the study patients (n=100)

Age (years)	Patients (n=100) n	Percentage (100%) %
≤20	16	16.0
21-30	56	56.0
31-40	20	20.0
>40	8	8.0

Table II shows the obstetrical history of the study patients, among the patients 78% were multipara and 76.0% patients had previous normal vaginal delivery, where 16% patients had previous history of abortion and 84 % patients had none.

Table II shows the obstetrical history of the study patients, among the patients 78% were multipara and 76.0% patients had previous normal vaginal delivery, where 16% patients had previous history of abortion and 84 % patients had none.

Table-II: Obstetrical history of the study patients (n=100)

Obstetrical history		Patients (n=100)	Percentage (100%)
Para			
	Primipara	22	22.0
	Multipara	78	78.0
Mode of previous delivery			
	Caesarean section	24	24.0
	NVD	76	76.0
Number of previous			
	Abortion	4	4.0
	MR	12	12.0
	None	84	84.0
Treatment received in previous abortion			
	D&C	2	12.5
	Medical termination	8	50.0
	MVA	4	25.0
	Not received	2	12.5
Married for (years)			
	<5	22	22.0
	5-15	48	48.0
	>15	30	30

Table III describe the obstetrical features of the patients, among the patients 70% were presented with incomplete abortion and complete abortion was 17%. Here 58% of the patients had pregnancy of 6-10 weeks, 50% patients had moderate bleeding, 64.0% patients presented with abdominal pain and 87.% patients were Haemo-dynamically stable.

Table-III: Presenting obstetrical features of the study patients (n=100)

Presenting features		Patients (n=100)	Percentage (100%)
Duration of pregnancy (weeks)		n	%
	<6	10	10.0
	6 – 10	58	58.0
	>10 -12	32	32.0
Type of abortion			
	Anembryonic pregnancy	13	13.0
	Incomplete abortion	70	70.0
	Incomplete MR	17	17.0
Attempts to terminate pregnancy			
	Yes	47	47.0
	No	53	53.0
Amount of bleeding			
	Mild	37	37.0
	Moderate	50	50.0
	Severe	13	13.0
Duration of bleeding (days)			
	<5	37	37.0
	5-10	50	50
	>10	13	13
Abdominal pain			
	Yes	64	64.0
	No	36	36.0
Passage of fleshy Mass			
	Yes	68	68.0
	No	32	32.0
Haemodynamic status			
	Stable	87	87.0
	Unstable with shock	13	13.0

Table IV Shows 66.0% presented with active bleeding, open cervical OS was found in 82.0% patents and product of conception was felt in 70.0% patients.

Table-IV: Per-vaginal examination of the patients (n=100)

Pervaginal examination		Patients (n=100) n	Percentage (100%) %
Active bleeding			
	Present	66	66.0
	Absent	34	34.0
Status of OS			
	Closed	38	38.0
	Opened	62	62.0
Position of Uterus			
	Antiverted	82	82.0
	Retroiverted	18	18.0
Cervix			
	Healthy	94	94.0
	Unhealthy	6	6.0
Tenderness			
	Present	24	24.0
	Absent	76	76.0
Product of Conception			
	Felt	70	70.0
	Hanging	12	12.0
	No felt	18	18.0

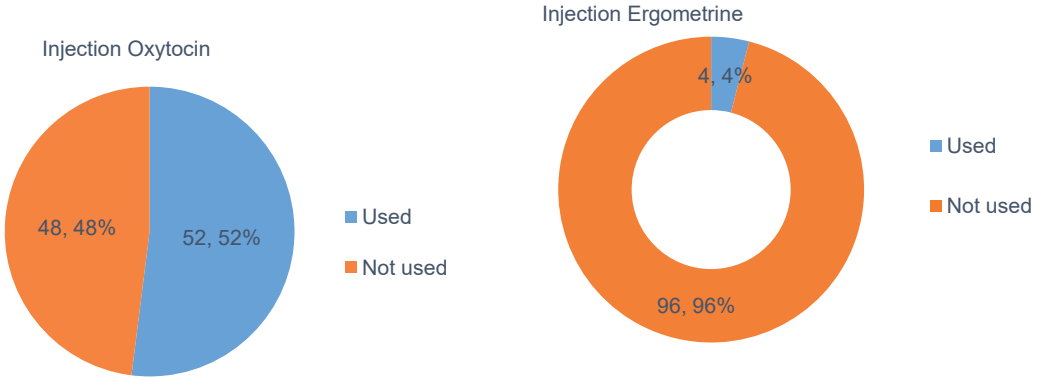


Figure- 1: *Distribution of oxytocic drugs (a) Injection Oxytocin and (b) Injection Ergometrine used by the patients*

Figure 1 (a and b) shows the use of oxytocic drugs for the patients. Among the oxytocic drugs injection oxytocin in 52.0% patients and injection ergometrine was used in 4.0% of patients followed by tablet misoprostol was used in 90% of the patients.

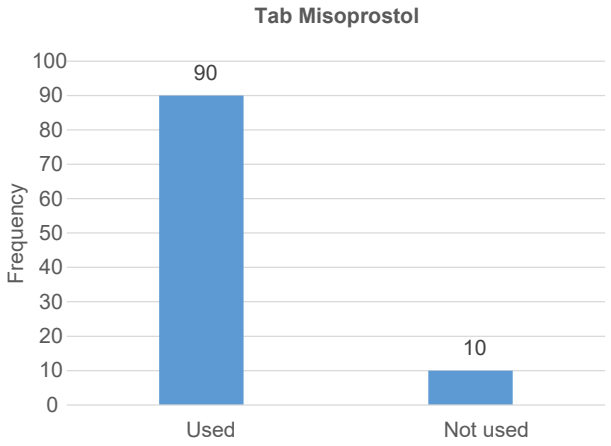


Figure-1(b): *Distribution of oxytocic drugs Tablet Misoprostol used by the patients.*

Table V shows the resuscitation requirement of the patients, here IV fluid infusion was required for 66.0% patients. Blood transfusion was given to 13.0% patients.

Table-V: Resuscitation requirement of the patients (n=100)

Resuscitation required	Patients (n=100) n	Percentage (100%) %
I/V fluid		
Needed	66	66.0
Not needed	34	34.0
Antibiotic		
Given	100	100.0
Not given	0	0.0
Blood transfusion		
Needed	13	13.0
Not needed	87	87.0

Table VI shows the use of para cervical block in all patients as a prime method of anesthesia. In addition to the tablet diazepam and NSAID were also used for pain medication in 97% patients where 3% patients required pethidine.

Table:VI: Use of pain medication of study population.

Sedation/Analgesics	Patients (n=100) n	Percentage (100%) %
Pethedine		
Used	3	3.0
Not used	97	97.0
Diazepam (Tablet)		
Used	97	97.0
Not used	3	3.0
NSAID (Tablet)		
Used	97	97.0
Not used	3	3.0
Para cervical block		
Used	100	100.0
Not used	0	0.0

Table VII shows that 46% of the patients had minimal per vaginal bleeding and average duration of procedure was 10-15 minutes among 46.0% of patients. Here, 26.0% patients needed >15 minutes to complete the MVA procedure.

Table: VII Amount of bleeding and duration of procedure of the patients (n=100)

Variable	Patients (n=100) n	Percentage (100%) %
Amount of bleeding		
5-10 ml (Mild)	46	46.0
>10 ml (moderate)	28	28.0
>30 ml (Severe)	26	26.0
Duration of procedure (min)	n	%
< 10	28	28.0
10 -15	46	46.0
> 15	26	26.0

Table VIII describes that excessive haemorrhage occurred in 4.0% patients during evacuation and shock was found in 2.0% patients. None of the patients had any sort of other complication like incomplete evacuation, repeat D & C or perforation.

Table-VIII: Complications of the study patients (n=100)

Complications	Patients (n=100) n	Percentage (100%) %
Hemorrhage	4	4.0
Shock	2	2.0
Incomplete evacuation	None	-
Repeat D&C	None	-
Infection	None	-
Perforation	None	-

Table IX shows the hospital stay of the patients, average hospital stay was 2- 12 hours in 65.0% patients and 20.0% patient stayed in hospital for > 12 hours.

Table-IX: Duration of hospital stay of the patients (n=100)

Hospital Stay	Patients (n=100)	Percentage (100%)
1-2 hrs	15	15.0
2 -12 hrs	65	65.0
> 12 hrs	20	20.0

Table X shows the cost of treatment of the patients, it was observed that cost of treatment was 75 -150 BDT in 96.0% patients and 200 – 500TK in 4.0% patients which was statistically significant.

Table-X: Distribution of the study patients according to cost of treatment (n=100)

Cost of treatment	Patients (n=100) n	Percentage (100%) %
75-150 Tk	96	96.0
200-500	4	4.0
>500	0	0.0

Table XI states the satisfaction of MVA procedure by the respondents, 96% patients were fully satisfied with this procedure.

Table-XI: Satisfaction of study population about MVA procedure (100)

Patient's Satisfaction about MVA procedure	Patients (n=100)	Percentage (100%)
Satisfied	96	96.0
Not satisfied	4	4.0

DISCUSSION

In this study it was observed that the average age of the patients (68%) was 21-30 years. Faichamnan et al.[15], have shown in their series, that the mean age of the patients were 27.5 ± 6.5 years and 26.4 ± 8 years in group I and Group II respectively, which closely resembled with the present study. Farooq et al.[12] have observed similar mean age of the patients having incomplete abortion, which support the present study, where the authors found the mean age was 28.04±6.19 years in group I and 29.35±6.4 years in group II. Similarly, Ghafar[10], Lukman and Pogharian.[18] Gomez et al.[17] have observed identical mean age of the patients having incomplete abortion and thus, support the present study.

Regarding the socioeconomic condition it was observed that 50% patients came from low socio-economic status. In this present series it was observed that most of the patients (80%) were housewives. In this study it was observed that most of the patients (84%) had no history of DM, heart disease, HTN bronchial asthma. Only 8% patients had DM and 6% patients had Hypertension & 2% patients had heart disease.

In this study it was observed that the average (58%) gestational age was 6 -10 weeks. Similarly, Faichamnan[15] showed the mean gestational age were 10.5 + 3.5 weeks and 11.4 + 4.3 weeks in group I and groups II respectively. Milingos et al.[25] and Westfall et al.[26] showed high success rate of using MVA especially in first or second trimester. In this study it was observed that majority (70%) of patients had incomplete abortion. Attempts to terminate pregnancy was found in 47% cases. Pereira et al.[16] mentioned in their study that MVA caused less blood loss, less time consuming, and resulted in shorter hospitalization. This surgical procedure was found to be efficient for treatment of incomplete abortions during the first trimester of pregnancy, with no complications after treatments. In this current study it was observed that more than half (37%) of the patients presented with mild bleeding and 50% patients had moderate bleeding and

their average duration of bleeding was found 5-7 days which was 66%. 94% patients were found haemodynamically stable. Faichamnan[15] showed bleeding significantly higher in group II (D & C) where the author found the mean blood loss was 74.3±60.1 ml and 104.2±104.1 ml in group I (MVA) and group II (D & C) respectively, which is similar with the current study.

In this present study it was observed that more than a half (64%) of the patients had abdominal pain. Almost similar findings regarding the pain was also obtained by Shelley, Healy and Grover.[27]

In this present study (68%) patients complained of passage of fleshy mass and rest 32% patients had none.

In this current study it was observed that more than one fourth (26%) of the patients received OCP. Contraceptive and history of hormonal intake was also observed by Ghafar.[10]

In this study it was observed that most of the patients (78%) were multipara. Faichamnan et al.[15] found 64.2% and 68.2% were multipara in group I and group II respectively, which is comparable with the current study.

In this current study it was observed that more than three fourth (76%) of study population had normal vaginal delivery. Maximum patients (76%) had not received any treatment and previous history of MR was present in 12% patient. `The average marital age was 2-10 years in 54% patient.

In general examination all patients were found haemodynamically stable. 35% patients had mild anaemia, dehydration was found in 12% patients. Clear lung was found 100.0% patients.

Regarding the P/A examination it was observed in this present study that tenderness was found in 20.0%. Height of uterus was found just palpable in 32.0% patients. Tenderness and scar mark were present which was not significant.

About the pervaginal examination it was observed in this current study that active bleeding was found in 66.0% patients. Cervical os was open in 62.0% patients and os was closed in 38.0% patients. Average size of uterus was found within 6 -10 weeks in 58.0% patients. Product of conception was felt in 70.0% patients.

In this current study it was observed that IV infusion was required in 66.0% patients because 66% patients presented with active bleeding. All patients received antibiotics. Only 13.0% patients received blood transfusion because of presented severe anaemia. Use of iv fluid and blood transfusion are similar with Pereira et al.[16] findings.

Regarding the oxytocic drugs used in this current study it was observed that injectable oxytocin was used in 52.0% patients. Ergometrine was used in only 4.0% patients. Misoprostol was used in 90.0% patients.

Para cervical block was used in all patients in study population for pain medication. Regarding the sedation/analgesics it was observed that pethedine was used only in 3.0% patients. Diazepam was used in 97.0% patients. NSAID was used in 97.0% patients. Almost one fourth (24.0%) of the patients who underwent manual vacuum aspiration used 7 mm canula.

In this present study, Blood loss was minimum in majority (46.0%) of patients. Average duration of procedure was found 10 -15 minute in 46.0% patients. Similarly, Faichamnan[15] obtained that the mean time for the operation was 17.2±8 minutes in group I and 44.6 ± 7 minutes in group II. Another study by Kulier[28] also stated that the operation time in the MVA group was shorter. Khani et al.[29] compared MVA with curettage, the duration of surgery was significantly shorter in the MVA group and patients had more bleeding in curettage group. Various other trials reported 95–100% efficacy with MVA obtained by Say et al.[30]; Greensalad et al.[7]

Regarding the need of anesthesia of study population it was observed that para cervical block was used in all patients (100%) Similarly, in faichamnan study para cervical block was used in group I and general anesthesia was used in group II in study population.

About the complications it was observed that hemorrhage was found in 4.0% patients. Shock was found in 2.0% patients, none of the patient had incomplete evacuation. Incomplete evacuation and repeat D&C was not needed for any patient in this study population. Grave complications like infection and perforation had not occured in this study population. Faichamnan[15] found four cases of pelvic inflammatory disease & no perforation was observed in both groups. No significant differences were found between these two groups regarding the completeness of conception removal or adverse effects.

Regarding the hospital stay it was observed that the average duration of hospital stay was 2-12 hrs in 65.0% patients.

Similar observations regarding the duration of hospital stay were also made by Farooq et al.[12]; Faichamnan[15]; Westfall et al.[26]

Mahomed et al.[20] documented in their study that given the safety and effectiveness of the MVA procedure and the potential for reducing health care costs and improving patient management, this technology should be considered by health care systems in developing countries for improving treatment of abortion complications. Regarding the cost of the study patients, in (96.0%) patient's hospital cost was 75-150 Tk. and (4.0%) patient's hospital cost was 200 to 500 Tk. Similarly the cost of procedure was significantly lower in MVA group observed by Farooq.[12]

CONCLUSIONS

This study was designed to observed the efficacy and simplicity of the MVA procedure and to established this as an alternative easy, cost effective, less complicated approach of treatment of incomplete abortion in comparison to others method like D & C, EVA. It can be concluded that manual vacuum aspiration is safe and effective for first-trimester termination of pregnancy. Manual vacuum aspiration needs less time to perform than others methods. Manual vacuum aspiration is associated with less pain but manual vacuum aspiration involves greater procedural difficulty.

Limitation of the study

The present study was conducted at a very short period due to time constrain and fund limitation. Small sample size was also a limitation of the present study

Recommendation

The safety and effectiveness of the MVA procedure and the potential for reducing health care costs. This technology should be considered by health care systems in developing countries for improving treatment of abortion complications. MVA is found to be equally safe, effective, simple and fast set of instruments which can be employed in the management of incomplete abortions. Integration of MVA in the medical training is recommended as it is a measure which can greatly contribute towards the reduction of maternal morbidity and mortality especially in a developing country like ours where resources are scare and alternatives are quite limited. For further study, the efficacy of the two studies should be confirmed with the randomized controlled trial.

REFERENCES

1. Creinin MD, Schwarlzn JL, Guido RS, Pymar HC. Early pregnancy failure – current management concepts. Obstet Gynaecol Surv 2001;56(2):105-113
2. Sara H, Garmel MD. Current Obstetric and Gynaecology diagnosis & treatment. Hemorrhage in early Pregnancy, 9th Edition, Lange Medical Book. USA 2003:272
3. Rolfe BE. Detection of fetal wastage. Fertil Steril 2006;37:660-665.
4. Alan H, De Cherney, Lawren Nath. Early Pregnancy Risk. Current Obstetric & Gynaecology Diagnosis & treatment. 10th Edition, McGraw-Hill, USA 2007:259.
5. Howie PW. Abortion and Ectopic Pregnancy. In : Whitefiled CR, Dewhurts Text Book of Obstetric and Gynaecology for the Post graduates Bath : 7th Edition. Black well Science Ltd. London 2007:94-105
6. Program for Appropriate Technology in Health (PATH). Manual vacuum aspiration for treatment of incomplete abortion. Outlook 1994;12(1).
7. Greensalad F, Benson J, Winkler J, Henderson V, Leonard A. Summary of clinical and programmatic experience with manual vacuum aspiration. Adv Abort Care 1993; 3:1–4.
8. International Planned Parenthood Federation (IPPF). International Medical Advisory Panel (IMAP) statement of safe abortion.IPPF Medical Bulletin 2001;35(5)
9. Baird Traci L, Susan, K, Flinn. Manual vacuum aspiration: Expanding women access to safe abortion services. Chapel Hill, NC, Ipas 2001.
10. Ghafar MAE. Comparative study of dilatation and curettage, manual and electric vacuum aspiration as methods of treatment of early abortion in Beni Suef, Egypt. International Research Journal of Medicine and Medical Sciences 2013;1(3):43-50.
11. Choobun T, Khanuengkitkong S, Pinjaroen S. A comparative study of cost of care and duration of management for first-trimester abortion with manual vacuum aspiration (MVA) and sharp curettage. Arch Gynecol Obstet 2012; 286(5), pp.1161-4.
12. Farooq F, Javed L, Mumtaz, A, Naveed N. Comparison of manual vacuum aspiration, and

dilatation and curettage in the treatment of early pregnancy failure. J Ayub Med Coll Abbottabad 2011;23(3).

13. Tasnim N, Mahmud G, Fatima S, Sultana M. Manual vacuum aspiration: a safe and cost-effective substitute of electric vacuum aspiration for the surgical management of early pregnancy loss. J Pak Med Assoc 2011;61(2):149-53.
14. Saciloto MP, Konopka CK, Velho MT, Jobim FC, Resener EV, Muradás RR et al.. Manual vacuum aspiration uterine treatment of incomplete abortion to 12 gestational weeks: an alternative to curettage. Rev Bras Ginecol Obstet 2011;33(10):292-6.
15. Faichamnan S. Outcomes of Manual Vacuum Aspiration and Uterine Curettage for Treatment of Incomplete Abortion. Khon Kaen Medical Journal 2010;34,
16. Pereira PP, Oliveira AL, Cabar FR, Armelin AR, Maganha CA, Zugaib M et al.. Comparative study of manual vacuum aspiration and uterine curettage for treatment of abortion. Rev Assoc Med Bras 2006;52(5):304-7.
17. Gomez, PI., Gaitan, H., Nova, C., Paradas, A., 2004. Paracervical block in incomplete abortion using manual vacuum aspiration: randomized clinical trial. Obstet Gynecol, 103(5 Pt 1), pp.943-51.
18. Lukman HY, Pogharian D. Management of incomplete abortion with manual vacuum aspiration in comparison to sharp metallic curette in an Ethiopian setting. East Afr Med J 1996;73(9):598-603.
19. Magotti RF, Munjinja PG, Lema RS, Ngwalle EK. Cost-effectiveness of managing abortions: manual vacuum aspiration (MVA) compared to evacuation by curettage in Tanzania. East Afr Med J 1995;72(4):248-51.
20. Mahomed K, Healy J, Tandon S. A comparison of manual vacuum aspiration (MVA) and sharp curettage in the management of incomplete abortion. Int J Gynaecol Obstet 1994;46(1):27-32.
21. Shwekerela B, Kalumuna R, Kipingili R, Mashaka N, Westheimer E, Clark W, Winikoffc B et al. Misoprostol for treatment of incomplete abortion at the regional hospital level: results from Tanzania. BJOG 2007;114:1363-1367.
22. Biquea C, Ustaa M, Deboraa B, Chongb E, Westheimerb E, Winikoffb B et al. Comparison of misoprostol and manual vacuum aspiration for the treatment of incomplete abortion. International Journal of Gynecology & Obstetrics 2007;98(3): 222-226.
23. Forma, Gulmezoglu. Department of Gynae and Obs, Emory University School of Mediline, Atlanta Georgian – 30303 USA. Cochrane Data Base System Rev 2001; (1);CD001993.
24. Dutta DC. Hemorrhage in Early Pregnancy. In : Hiralal Konar. Text Book of Obstetric.6th Edition.New Central Book Agency (P) Ltd. India 2006:164-165
25. Milingos DS, Mathur M, Smith NC, Ashok PW. Manual vacuum aspiration: a safe alternative for the surgical management of early pregnancy loss. BJOG 2009;116(9)
26. Westfall JM, Sophocles A, Burggraf H, Ellis S. Manual vacuum aspiration for first-trimester abortion. Arch Fam Med 1998; 7(6).
27. Shelley JM, Healy D, Grover S. A randomised trial of surgical, medical and expectant management of first trimester spontaneous miscarriage. Aust NZJ Obstet Gynaecol 2005; 45(2):122–7.
28. Kulier R, Fekih A, Hofmeyr GJ, Campana A. Surgical methods for first trimester termination of pregnancy. Cochrane Database Syst Rev 2010;(4)
29. Khani B, Karami N, Khodakarami N, Solgi T. Comparison of incomplete abortion treatment between Manual Vacuum Aspiration and Curettage. Journal of Isfahan Medical School 2010;27(102):753–60.
30. Say L, Kulier R, Gulmezoglu M, Campana A. Medical versus surgical methods for first trimester termination of pregnancy. Cochrane Database Syst Rev 2005;25: CD003037

Bangladesh Med J. 2022 May; 51(2)
DOI: https://doi.org/10.3329/bmj.v51i2.69321

Original Article

Pattern of Antimicrobial Resistance amongst Pathogens Isolated from Children's Blood at a Private Diagnostic Clinic in Sylhet District of Bangladesh

Benzamin M[1]*, Chowdhur MZR[2], Khatoon M[3], Chowdhur T[4], Molla MS[5], Tamal TB[6], Siddiquee JA[7], Ruhul KH[8]

Abstract

The incidence of antibiotic-resistant sepsis in children, particularly multidrug-resistant (MDR) sepsis, is increasing day by day. The aim of this study is to describe the pattern of antimicrobial resistance amongst pathogens isolated from blood sepsis of children. This descriptive type of cross-sectional study was carried out in the Microbiology Section of the Popular Diagnostic Centre, Sylhet from April to October 2021. Data were collected from the data record software at centre. All the blood culture positive reports of children of age 0-120 months were collected and antibiotic sensitivity tests were done to identify different organisms. Patients with incomplete data were excluded from this study. A total of 83 patient reports were appraised, and data were analyzed by Statistical Package for Social Sciences (SPSS) software version 22. According to the reports majority of the children (59%) were male and male-female ratio was 1.4:1. Mean age of the children was 16.54±26.4 months (Mean±SD). About one third (33%) of children were within 1 month, 60 % were between 31 to 60 days, and 7.2% within more than 60 days. Most frequent (72.3%) organisms were gram positive, among them nearly half (49.4%) of the organisms were Staphylococcus aureus. More than one fourth (27.7%) of the organisms were gram negative, among them E. Coli was common organism and found in 15.7% of the cultures specimen of children. Here we found Azithromycin, Ceftazidime, Ceftriaxone and Colistin were resistant in most of the gram-positive cases and in gram-negative cases most of the antibiotic were resistant, where Ceftazidime was resistant in all cases. Nearly two-third (64%) of the organisms were multidrug resistant (MDR), 6% were extensively drug-resistant (XDR) and none were pan-drug resistant. About 61% Staphylococcus spp, 77% of E. coli, 43% of Klebsiella were MDR. The majority of sepsis in children are MDR, with Staphylococcus spp. and E. coli being the most common organism. Anti-microbial resistance surveillance and farther large scale studies are now crucial to revise the National Antibiotic Guideline.

Keywords: *Multidrug-resistant (MDR), sepsis, children, Bangladesh.*

1 Dr. Md Benzamin, Pediatric Gastroenterology and Nutrition, Sylhet MAG Osmani Medical College Hospital (SOMC), Sylhet. E-mail: drmd.benzamin@yahoo.com
2 Dr. Md Ziaur Rahman Chowdhury, Departments of Pediatrics, SOMC, Sylhet.
3 Dr. Mohsina Khatoon, Departments of Microbiology, Sylhet Women's Medical College, Sylhet, Bangladesh
4 Dr. Tanjina Chowdhur, Departments of Pediatrics, SOMC, Sylhet.
5 Dr. Muhammad Solaiman Molla, Departments of Pediatrics, SOMC, Sylhet.
6 Dr. Tuhin Barua Tamal, Departments of Pediatrics, SOMC, Sylhet.
7 Dr. Jubayer Ahmed Siddiquee, Senior Medical Officer, Pioneer Hospital, Sylhet.
8 Dr. Kamrul Hassan Ruhul, Departments of Cardiology, SOMC, Sylhet.
*For Correspondence

INTRODUCTION

Sepsis is the leading cause of sickness, mortality, and healthcare utilization among children around the world. Globally, there are an estimated 22 cases of childhood sepsis per 100,000 person-years and 2,202 cases of neonatal sepsis per 100,000 live births, for a total of 1.2 million cases of childhood sepsis every year.[1] Sepsis is defined as a systemic inflammatory response syndrome (SIRS) triggered by bloodstream infections.[2,3] SIRS in children is defined by at least two of the following criteria, one of which is an abnormal temperature or leukocyte count: Temperatures of more than 38.5 °C or less than 36 °C, tachycardia (defined as a mean heart rate more than two standard deviations above the normal for age) or bradycardia for infants younger than 1 year (defined as a mean heart rate less than the tenth percentile for age), tachypnea (defined as a mean respiratory rate more than two standard deviations above the normal for age), increased or decreased leukocyte count for age, or Over 10% of Neutrophils are Premature.[4] There is a large variety of pathogens that can cause sepsis in children, and this range varies not only by age but also by underlying condition and geographic location.[5] Neonatal sepsis is typically caused by Group B streptococci (GBS),

Escherichia coli (E. coli), and Listeria monocytogenes. In children younger than 5 years old, H. influenzae type b (Hib), Neisseria meningitidis, and Streptococcus pneumoniae are likely causes of bacterial illness. 6 Frequent hospitalizations of children may increase their exposure to MRSA and vancomycin-resistant enterococci infections. Pseudomonas aeruginosa, along with alpha-haemolytic streptococci and fungi, can cause sepsis in immuno-compromised and chronically ill children.[6,7] In both adults and children with sepsis, MDR-GN bacteria are becoming increasingly resistant to antibiotics. MDR pathogens (resistance to at least three distinct classes of antibiotics) are increasingly reported, while pan-resistant strains (resistance to all listed medicines) have already emerged.[8,9] The situation is even worse in low- and middle-income nations than in the rich world.[10] Southeast Asia is regarded as having the highest AMR risk among all WHO regions.[11]

The abuse and misuse of antibiotics, the dissemination of successful clones owing to globalization, and poor hospital hygiene, which allows the development of resistant clones, are the primary causes of antibiotic resistance. Concurrently, there is a dearth of new antimicrobial drugs with the ability to tackle resistant microbes.[12] Antibiotic-resistant microorganisms are becoming increasingly prevalent worldwide. To comprehend the gravity of the threat posed by AMR, the World Health Organization (WHO) estimates that infections caused by multidrug-resistant (MDR) bacteria result in 700,000 fatalities annually across all age groups, including almost 200,000 infants.[13] The treatment of children with sepsis caused by MDR pathogens presents numerous difficulties for clinicians. The absence of data is the most significant issue. Due to the paucity of evidence-based pediatric trials, the majority of data about the efficacy of treatments for sepsis caused by multidrug-resistant (MDR) pathogens in children are drawn from adult studies. Appropriate research can somewhat fill in existing gaps.

MATERIALS AND METHODS

This descriptive cross-sectional study was conducted in the Microbiology Section of the Popular Diagnostic Centre, Sylhet from April to October 2021. Data were collected from the blood culture positive reports and antibiotic sensitivity tests (for various species) reports of children aged 0-120 months obtained from record software of the microbiology section at the Popular Diagnostic Centre, Sylhet, Bangladesh. Blood samples were directly inoculated into FAN blood culture bottles using aseptic precautions. The BACT/Alert machine incubated bottles for up to 5 days. On MacConkey (MC) agar, chocolate agar and blood agar (5% sheep blood) plates, positive culture samples were placed directly. Pathogenic bacteria were discovered using normal bacteriological techniques. Patients with insufficient data were ruled out from this study. Age, sex differences, and antibiotic sensitivity of the organism were also examined. Based on in-vitro antibiotic susceptibility tests, multidrug resistance was defined as the inability to respond to at least one antimicrobial from three or more classes. Extensively drug-resistant (XDR) organisms are characterized as those with susceptibility to only one or two classes of antimicrobials and resistance to all other kinds. Resistance to all types of antibiotics is considered as pan-drug resistance. A total of 83 patient data were assessed, with the data entered into Microsoft Excel and analyzed using version 22 of the Statistical Package for the Social Sciences (SPSS) program. The purpose of the study was identified the most prevalent pathogenic organisms responsible for bloodstream infections (BSI) and MDR pathogens in children in Sylhet, Bangladesh.

RESULTS

Table I shows the distribution of the reported children by age; among 83 children with a positive blood culture, 49 (59%) males and 34 (41% females), for a male-to-female ratio of 1.40:1. The range of ages was from 6 days to 108 months, with a mean age of the children was 16.54±26.4 days (Mean±SD). Here, 32.5% of children were younger than 30 days, 60% were between 12 to 60 days, and 7.2% were older than 60 days.

Table- I: Distribution of patients by age

Patient Age Categories	No. of Cases (%)
≤1 month	27(32.5%)
> 1 month -<60 months	50 (60.3%)
≥ 60 months	6(7.2%)

Table II shows the distribution of the isolated pathogens from the children blood culture reports. Here, Staphylococcus aureus, detected in 41 (49.4%) of the blood cultures (54% from boys and other 46% from girls), followed by Coagulase-negative Staphylococcus in 18 (21.7) and Streptococcus pneumoniae in 1 (1.2%). Gram negative was detected in 23 (27.7%) with E. Coli was found in 13 (15.7%) of the cultures, followed by Klebsiella spp. in 33 (6%) and Pseudomonas aeruginosa in 1 (1.2%).

Table- II: Distribution of the pathogens according to type and Sex

Isolated Organism	Frequency n (%)	Boys (49)	Girls (34)
Gram positive	60 (72.3)	32	28
Gram negative	23 (27.7)	17	6
Staphylococcus Aureus	41 (49.4)	22(53.7)	19(46.3)
Coagulase negative Staph	18(21.7)	9 (50)	9 (50)
Streptoccus Pneumoniae	1(1.2)	1(100)	0
E. Coli	13 (15.7)	9 (69.2)	4(30.8)
Klebsiella spp	7 (8.4)	5 (71.4)	2 (28.6)
Pseudomonus Aeruginosa	3 (3.6)	3(100)	0

Table III displays the patterns of resistance exhibited by the gram-positive pathogens in the study samples. Here, Amoxyclav, Amikacin, Vancomycin, and Doxicyclin were sensitive antibiotics in higher frequency, whereas Azithromycin, Ceftazidime, Ceftriaxone, and Colistin were the resistance.

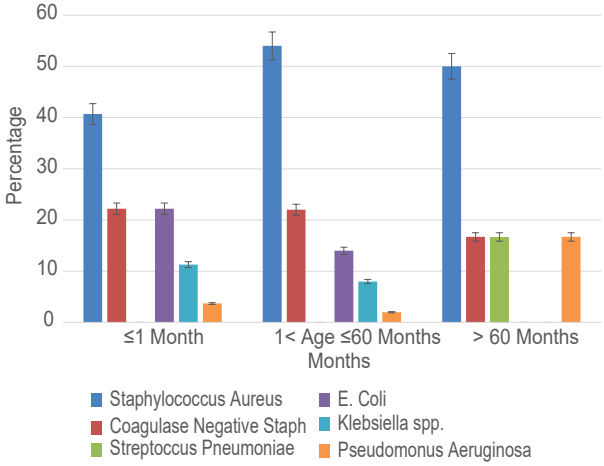


Figure- 1: *Distribution of the pathogen according to age*

Figure 1 displays the distribution of the pathogen by age. Among gram-positive bacteria, total cases were 27 in age group ≤1 month, where staphylococcus aureus were detected in 11 (40.7), Coagulase negative Staph. in 6 (22.2%), E. Coli in 6 (22.2%) children.

Table- III: Resistance patterns of the gram positive pathogens.

Antibiotic	Staphylococcus Aureus			Coagulase –ve Staphylococcus			S. pneumonae		
	R	S	I	R	S	I	R	S	I
Amoxyclav	2.4	**97.6**	00	16.7	**66.7**	16.7	00	**100**	00
Amikacin	4.9	**87.8**	7.3	11.1	**77.8**	11.1	00	**100**	00
Gentamicin	24.4	73.2	2.4	38.9	61.1	00	00	100	00
Vancomycin	7.3	**92.7**	00	11.1	**88.9**	00	00	**100**	00
Ciprofloxacin	36.6	63.4	00	22.2	72.2	5.6	00	100	00
Levofloxacin	4.9	80.5	14.6	27.8	66.7	5.6	00	100	00
Azithromycin	**80.5**	14.6	4.9	72.2	27.8	00	100	00	00
Cefaclor	41.5	56.1	2.4	61.1	27.8	11.1	100	00	00
Cefixime	92.7	7.3	00	88.9	11.1	00	100	00	00
Doxicyclin	2.4	**92.7**	4.9	5.6	**88.9**	5.6	00	**100**	00
Cefuroxime	31.7	63.4	4.9	44.4	50	5.6	100	00	00
Ceftazidime	**85.4**	12.2	2.4	77.8	16.7	5.6	100	00	00
Ceftriaxone	**56.1**	43.9	00	**72.2**	16.7	11.1	**100**	00	00
Imipenem	14.6	82.9	2.4	38.9	61.1	00	100	00	00
Meropenem	17.1	80.5	2.4	27.8	50	22.2	100	00	00
Colistin	**53.7**	46.3	00	**66.7**	33.3	00	**100**	00	00
Linezolid	4.9	95.1	00	16.7	83.3	00	00	100	00
Tazobactum+ Pipercilin	14.6	85.4	00	38.9	61.1	00	00	100	00

Table IV shows the resistance patterns of the gram-negative pathogens. Here, antibiotics were resistant in higher frequency, and Ceftazidime was resistant in every case.

Table- IV: Resistance patterns of the gram negative pathogens.

	Klebsiella			E.Coli			Pseudomonus		
Antibiotic	**R**	**S**	**I**	**R**	**S**	**I**	**R**	**S**	**I**
Amoxyclav	71.4	14.3	14.3	41.7	58.3	00	00	100	00
Amikacin	57.1	28.6	14.3	46.2	46.2	7.7	66.7	33.3	00
Gentamicin	71.4	28.6	00	83.3	16.7	00	66.7	33.3	00
Vancomycin	57.1	42.9	00	75	25	00	100	00	00
Ciprofloxacin	57.1	42.9	00	23.1	76.9	00	00	100	00
Levofloxacin	57.1	42.9	00	23.1	76.9	00	00	100	00
Azithromycin	71.4	14.3	14.3	61.5	23.1	15.4	100	00	00
Cefaclor	85.7	00	14.3	83.3	16.7	00	100	00	00
Cefixime	85.7	00	14.3	100	00	00	66.7	33.3	00
Doxicyclin	14.3	85.7	00	25	75	00	00	100	00
Cefuroxime	85.7	14.3	00	92.3	7.7	00	100	00	00
Ceftazidime	100	00	00	100	00	00	100	00	00
Ceftriaxone	71.4	14.3	14.3	84.6	15.4	00	100	00	00
Imipenem	57.1	28.6	14.3	30.8	61.5	7.7	33.3	66.7	00
Meropenem	71.4	28.6	00	23.1	76.9	00	33.3	66.7	00
Colistin	14.3	85.7	00	50	50	00	100	00	00
Linezolid	85.7	14.3	00	83.3	16.7	00	100	00	00
Tazobactum+ Pipercilin	57.1	28.6	14.3	30.8	69.2	00	33.3	66.7	00

Table V demonstrates the distribution of AMR according to age; here, 61% of registances of organism in children younger than 5 years were MDR, while 100% of cases in children older than 5 years were MDR.

Table- V: Frequency AMR according to age

Patient Age Categories	MDR (%)	XDR	Pan-drug resistance
≤1 month (27)	18 (66.7)	2 (7.4)	00
> 1 month -<60 months (50)	29 (58)	3(6)	00
≥ 60 months (6)	6(100)	00	00

Table VI shows the extent of antibiotic resistance; here, 64% of the organisms were MDR, 6% were XDR, and none of the species were pan-drug resistant. 61% of Staphylococcus spp, 77% of E. coli, and 43% of Klebsiella were multidrug-resistant.

Table- VI: Type of Antibiotic resistance (ABR)

Antibiotic resistance (ABR)	Frequency n (%) n=83	Staph. Aureus n=41	Coagulase –ve Staphylococcus n=18	Strepto. Pneumoniae n-1	E.Coli n=13	Klebsiella n=7	Pseudomonas n=3
MDR	53(63.9)	25 (61)	12 (66.7)	1(100)	10 (76.9)	3 (42.9)	2 (66.7)
XDR	5 (6)	0	0	0	1 (7.7)	3 (42.9)	1(33.3)
Pan-drug resistance	0	0	0	0	0	0	

DISCUSSION

Antibiotic resistance is a global challenge, although impoverished countries are more at risk due to unsanitary environments and inadequate healthcare infrastructure. This is the first study conducted in Sylhet to examine antibiotic resistance in blood culture-positive septicemia in children. Staphylococcus aureus (40.7%), followed by Coagulase-negative Staphylococcus (22.2%), E. coli (22.2%), Klebsiella spp (11.3%), and Pseudomonas aeruginosa (3%), was the most prevalent organism in our study involving children less than one month. The majority of previous research has found that gram-negative organisms are the more prevalent. Shirin et al. discovered that gram negative bacteria comprised 77.4% of the neonate group, with Klebsiella pneumonae being the most prevalent (41.7%), while gram positive bacteria comprised 11.9%, with Staphylococcus Aureus and Streptococcus being equally represented (5.95% each).[15] According to Rafi et al, Escherichia coli was the most commonly recovered gram-negative bacterium from blood samples of suspected newborns with sepsis (40.7%), followed by Klebsiella Pneumoniae (18%). The most prevalent gram-positive organisms were Staphylococcus Aureus (27.5%) and Staphylococcus Saprophyticus (8.8%).[16] The most prevalent organisms in the study population were gram-positive (72,3%),with Staphylococcus aureus (49.4%) being the most prevalent, followed by Coagulase-negative Staphylococcus (21.7%) and Streptococcus pneumoniae (1.2%). E. coli (15.7%) was the most prevalent Gram-negative bacterium (27.7%), followed by Klebsiella spp. (3.6%) and Pseudomonas Aeruginosa (1.2%). This organism frequency differs from other studies. Chisti et al., research at ICDDR'B revealed that Gram-negative pathogens predominated, accounting for 83 (77%) of positive cultures. These were Pseudomonas (26.5%), Escherichia coli (20%), Salmonella enterica (17%), and Klebsiella Pneumoniae (13%). Pathogens that were Gram-positive included Pneumococcus (8%) and Staphylococcus Aureus (7%).[17] Ahmed et al., reported that S. Typhi was the most frequently isolated blood-borne bacterial pathogen, accounting for 36.9% of all blood-borne bacterial pathogens. Other commonly isolated organisms included coagulase-negative Staphylococcus species (21.5%), Pseudomonas species (12.5%), S. Paratyphi A, B (8.9%), and Acinetobacter species (5.1%). Pseudomonas species S. Paratyphi A, B, and Serratia species were prevalent in the over five-year-old age group. In contrast, non-typhoidal Salmonella species and S. pneumoniae were common among children younger than five years old.[18] Amoxyclav, Amikacin, Vancomycin, and Doxicyclin were the most sensitive antibiotics against gram-positive organisms, while Azithromycin, Ceftazidime, Ceftriaxone, and Colistin were resistant in the majority of instances. In gram-negative organisms, the majority of antibiotics were resistant in the majority of cases, and Ceftazidime was resistant in every case. According to a study by Shirin et al., the majority of isolated gram-negative bacteria were resistant to ampicillin, gentamicin, and ceftazidime, although gram-positive bacteria preserved 20-80% susceptibility. Amikacin, netilmicin, ciprofloxacin, and levofloxacin were less effective against Klebsiella than Acinetobacter. Approximately 45 to 65 percent of gram-negative bacteria exhibited resistance to imipenem and meropenem, but gram-positive bacteria exhibited less resistance. Klebsiella and Acinetobacter were resistant to piperacillin similarly to the carbapenem group, whereas gram-positive bacteria were completely sensitive to piperacillin.[15] Bacteria were 100% sensitive to imipenem, according to Islam et al. (86% for meropenem, 83% for ceftazidime, and 75% for ciprofloxacin).[19] Resistance to all commonly used empiric antibiotics, by Chisti et al (ampicillin, gentamicin, ciprofloxacin, and ceftriaxone).[17]This study found, None organism were found 100% sensitive. About 64% of the organisms were MDR, 6% XDR and non were pan-drug resistant. About 61% Staphylococcus spp, 77% of E. coli, 43% of Klebsiella, 68% of Pseudomonas and 100% of Strepto. Pneumoniae were MDR. Around 60% cases of organism in under 5 years children, were MDR and 100% cases of 5 years and above were MDR. Ahmed et al., found an overall increase in the presence of Gram-positive bacteria was observed, but most significantly we observed the percentage of MDR Gram-positive bacteria to double over the study period from 2004 to 2014. Overall, Gram positive bacteria were more resistant to most of the commonly used antibiotics than Gram-negative bacteria, but the MDR level was high in both groups. At 2014, about 74% gram-negative and 35% were gram-positive. Acinetobacter species (65.8%), Pseudomonas species (21.2%), Gram-Negative (74.1%), Escherichia coli (72.2%), Klebsiella species (81.4%), Enterobacter species (70.6%), Gram-Positive (35.4%), Staphylococcus Aureus (63.3%), Streptococcus pneumoniae) (15.4%), Streptococcus species (30.4%).[18] On the basis of a systematic review by Murray et al., the six leading pathogens responsible for AMR-related deaths (Escherichia coli, followed by Staphylococcus aureus,

Klebsiella pneumoniae, Streptococcus pneumoniae, Acinetobacter baumannii, and Pseudomonas aeruginosa) were responsible for 929000 (660,000–1270,000) deaths.[20] Our research discovered a nearly identical pathogen in Sylhet, Bangladesh.

CONCLUSIONS

Anti-microbial resistance surveillance is an essential tool for antibiotic guidelines and successful treatment outcome. This study found that gram-positive bacteria, specifically Staphylococcus spp. and E. coli, are the most common organisms causing sepsis in children. All gram-positive and gram-negative microbes identified exhibited a high level of antibiotic resistance. About 64% of the organisms were MDR, while 6% were XDR. This is an important observation and requires further studies. The significance of the study is the observation of XDR, which may have a future impact for policy makers in revising the national antibiotic guideline for the management of patients.

REFERENCES

1. Fleischmann-Struzek C, Goldfarb DM, Schlattmann P et al (2018) The global burden of paediatric and neonatal sepsis: a systematic review. Lancet Respir Med 6:223–230)
2. American College of Chest Physicians/Society of Critical Care Medicine Consensus Conference. Definitions for sepsis and organ failure and guidelines for the use of innovative therapies in sepsis. Crit Care Med. 1992;20(6):864–74
3. Levy MM, Fink MP, Marshall JC, Abraham E, Angus D, Cook D, Cohen J, Opal SM, Vincent JL, Ramsay G, SCCM/ESICM/ACCP/ATS/SIS. 2001 SCCM/ESICM/ ACCP/ATS/SIS international sepsis definitions conference. Crit Care Med. 2003;31(4): 1250–6.)
4. Goldstein B, Giroir B, Randolph A. International consensus conference on Paediatric sepsis: international paediatric sepsis consensus conference: definitions for sepsis and organ dysfunction in paediatrics. Pediatr Crit Care Med. 2005;6(1):2–8.)
5. (Peshimam N, Nadel S. Sepsis in children: state-of-the-art treatment. Therapeutic Advances in Infection. 2021 Jan;8:204993612110553.)
6. Randolph AG and McCulloh RJ. Pediatric sepsis: important considerations for diagnosing and managing severe infections in infants, children, and adolescents. Virulence 2014; 5: 179–189.
7. Weiss SL, Peters MJ, Alhazzani W, et al. Surviving sepsis campaign international guidelines for the management of septic shock and sepsis-associated organ dysfunction in children. Pediatr Crit Care Med 2020; 21: e52–e106
8. Bonomo RA, Szabo D. Mechanisms of multidrug resistance in Acinetobacter species and Pseudomonas aeruginosa. Clin Infect Dis 2006;43(Suppl 2):S49-56
9. Miriagou V, Tzelepi E, Daikos GL, et al. Panresistance in VIM-1-producing Klebsiella pneumoniae. J Antimicrob Chemother 2005;55:810-11)
10. Zaidi AK, Thaver D, Ali SA, Khan TA. Pathogens associated with sepsis in newborns and young infants in developing countries. Pediatr Infect Dis J 2009;28: S10-18)
11. Chereau F, Opatowski L, Tourdjman M, Vong S. Risk assessment for antibiotic resistance in South East Asia. BMJ. 2017; 358:j3393. https://doi.org/10.1136/bmj.j3393 PMID: 28874338
12. Freire-Moran L, Aronsson B, Manz C, et al. Critical shortage of new antibiotics in development against multidrug-resistant bacteria-Time to react is now. Drug Resist Updat 2011;14:118-24)
13. Fight Antimicrobial Resistance: Protect Mothers and Newborns. In 4th Global Conference of Women Deliver; WHO Regional Office for Europe: Copenhagen, Denmark, 2016; Available online: http://who.int/drugresistance/activities/Women-Deliver-AMRside-event-Handout-May2016.pdf?ua=1 (accessed on 19 March 2021).
14. Magiorakos AP, Srinivasan A, Carey RB, Carmeli Y, Falagas ME, Giske CG, Harbarth S, Hindler JF, Kahlmeter G, Olsson-Liljequist B, Paterson DL, Rice LB, Stelling J, Struelens MJ, Vatopoulos A, Weber JT, Monnet DL (2012) Multidrug-resistant, extensively drug-resistant and pandrug-resistant bacteria: an international expert proposal for interim standard definitions for acquired resistance. Clin Microbiol Infect 18:268–281
15. Shirin M, Hossain MM, Afrin M, Al Mamun MA. Bacterial etiology and antibiotic resistance pattern of neonatal sepsis: a study in a tertiary care hospital, in Bangladesh.Int J Contemp Pediatr. 2019 Sep;6(5): 1839-1844

16. Rafi MA, Miah MM, Wadood MA, Hossain MG. Risk factors and etiology of neonatal sepsis after hospital delivery: A case-control study in a tertiary care hospital of Rajshahi, Bangladesh. PloS one. 2020 Nov 13;15(11):e0242275.

17. Chisti MJ, Harris JB, Carroll RW, Shahunja KM, Shahid AS, Moschovis PP, Schenkel SR, Hasibur Rahman AS, Shahrin L, Faruk T, Kabir F. Antibiotic-resistant bacteremia in young children hospitalized with pneumonia in Bangladesh is associated with a high mortality rate. InOpen Forum Infectious Diseases 2021 Jul (Vol. 8, No. 7, p. ofab260)

18. Ahmed D, Nahid MA, Sami AB, Halim F, Akter N, Sadique T, Rana MS, Elahi MS, Rahman MM. Bacterial etiology of bloodstream infections and antimicrobial resistance in Dhaka, Bangladesh, 2005–2014. Antimicrobial resistance & infection control. 2017 Dec;6(1):1-1.

19. Islam S, Akand AR, Nova TT, Lehmann C, Chisti MJ. Sensitivity Patterns of Bacterial Pathogens Isolated from Blood Cultures of Under-Five Children with Pneumonia and Clinical Sepsis. Life. 2021 May 18;11(5):450.

20. Murray CJ, Ikuta KS, Sharara F, Swetschinski L, Aguilar GR, Gray A, Han C, Bisignano C, Rao P, Wool E, Johnson SC. Global burden of bacterial antimicrobial resistance in 2019: a systematic analysis. The Lancet. 2022 Feb 12;399(10325):629-55.

Bangladesh Med J. 2022 May; 51(2)
DOI: https://doi.org/10.3329/bmj.v51i2.69257

Original Article

Delay in Care Seeking for Menstrual Regulation

* Sultana S[1], Nahar S[2], Yeasmin S[3]

Abstract

In Bangladesh menstrual regulation (MR) services are available at all major government and private hospitals, and even at government primary health care facilities. In spite of wide availability, women who do not use menstrual regulation services from proper facilities may resort to induce unsafe abortion by non-medical or untrained health workers in unhygienic condition. Worldwide, nearly 1 in 10 pregnancies end in unsafe abortion and World Health Organization (WHO) estimates that 18 out of 20 unsafe abortions takes place in developing countries. Induced abortion leading to complication such as bleeding, infection injuries and even death, these deaths could be prevented if women had an access to safe abortion facilities. This cross sectional study was carried out among fifty two women from family planning unit of Institute of Child and Mother Health (ICMH), Dhaka from December 2009 to May 2010. The purpose of this study was to identify the factors for delay in care seeking of menstrual regulation (MR). The data were collected by using the pretested questionnaires and cases were selected from the women who came for seeking care of MR after 10 weeks of amenorrhoea. Duration of amenorrhoea was confirmed by taking history and in some cases by ultrasonography. After incorporation of the socio-demographic data; factors or reasons of delay in MR were found due to personal, social, service and family related events. The mean age of respondents was 22.14 years. About 75% of the respondents were housewives and 79% were illiterate. The mean age of marriage 19.5 years. Regarding husband's educational level of the respondent, more than one-third (37%) was class I – V, others one-third (33%) was above the primary level rest of the husbands were higher secondary and above. More than two-third (70%) of the respondents delivered 1 to 3 live children and used oral contraceptive pills. Most of the (87%) of women gave right answer about MR and most of them (85%) had knowledge about adverse effect of MR. Nearly two-third (65%) came to know about MR form relatives/neighbors, where one-fourth (25%) from health workers and rest them from mass media/ others. Most of the (87%) respondents answered correctly about advantages of MR, however, 60% did not know about the proper time of performing MR after cessation of menstruation. Most of the respondents (85%) knew about the side effects of MR; among them more than one-third (37%) told excessive bleeding was adverse effects of MR, however 33%, 8%, 6% and rest 4% told pain, sterility, perforation and infection respectively were the adverse effects of MR. Three-fifth (60%) of the patients didn't know about the right time of pursue care for MR and 63% of them were unaware about legal aspects of MR that they have right to seek MR. More than half of the respondents (56%) stated the reasons for the delay due to their personal problem where, 19%, 15% and 10% of them were specified the reasons as social factor, service related reason and family conflict respectively. Among the respondents of personal reason for delaying MR, more than half of them (52%) took oral tablets for abortion at home, 41% failed to understand their amenorrhoea and only 7% were unaware about service facility for MR. Regarding familial reasons for delay of MR, 60% pointed out the security problem and remaining 40% told about resistance by husband/others or absence of husband in the houses. The main (70%) social reasons of delaying MR was due to spiritual bindings and 30% was due to public disgrace. Service facility related reasons for delaying MR were treatment cost (62%), distance of facility (25%) and substandard services (13%). The study findings suggested that women had good knowledge about MR even they made delay due to unawareness of their legal rights, personal issues, social and service related causes. Strengthening of reproductive health services through community clinic at community level with available awareness building program on MR may minimize the delay for care seeking of MR among women.

Keywords: delay in care seeking, MR, unsafe abortion.

1 * Dr. Sohana Sultana, Department of Gynecology and Obstetrics, Assistant Surgeon, 250 bed, General Hospital, Munshiganj, Email: drsohanasultana1980@gmail.com
2 Dr. Sabikun Nahar, Medical Officer, Department of Gynecology and Obstetrics, Sheikh Hasina National Burn & Plastic Surgery Institute (SHNBPSI), Dhaka.
3 Dr. Sabina Yeasmin, Department of Gynecology and Obstetrics, Junior Consultant, OCC, DMCH.
*For Correspondence

INTRODUCTION

Safe motherhood is the legitimate demand and right of all women all over the globe. But it remains one of the most important and unsolved issues. Unwanted or unplanned pregnancy leads to unsafe abortion and it is a major cause of concern in safe motherhood program. Each year women around the world experience 75 million unwanted pregnancies. According to the Bangladesh Demographic and health survey (DHS), 2% of a sample of 9640 currently married women said that they had terminated an unwanted pregnancy.[1] Two-thirds of these terminations (65%) involved menstrual regulation which is considered as an interim method of establishing non-pregnancy, for a woman at risk of being pregnant, whether or not she is pregnant infact.[2] The method is safe, effective and easy to maintain risks are less. In Bangladesh menstrual regulation services are available at all major government hospitals and health facilities and are legal for pregnancies of 6-10 weeks. In spite of wide availability, women who do not use menstrual regulation services may resort to induce unsafe abortion herself, by non-medical person or by health workers in unhygienic condition. They do it by inserting a foreign object into the uterus or by indigenous oral medicine.[3] swallowing harmful substance or by improperly performed dilatation and curettage. Some of these are women who have been rejected from MR facilities due to longer duration of their pregnancy. Most women seeking abortion are married and having children. Adolescents are also resort to abortion. In comparison with adults, adolescents are more likely to delay the abortion, resort to unskilled persons to perform it, use dangerous methods and present late when complications arise.[4] Abortion performed after 12 weeks of gestation pose greater risks of medical complication than performed during the first trimester. Induced abortion is a national problem in women's health as it is for the whole world. Worldwide, nearly one in 10 pregnancies end in unsafe abortion[6] and WHO estimate showed that 18 out of 20 unsafe abortions takes place in developing region of the world. Induced abortion leading to complication such as bleeding, infection injuries and even maternal death, these deaths could be prevented if women had an access to safe abortion facilities. Menstrual regulation (MR), an early termination within 6-10 weeks without pregnancy confirmation, is widely provided through a network of the government health services since 1978. Menstrual regulation (MR) using vacuum aspiration is widely available in. Bangladesh through public, NGO and private sector facilities, even though abortion is illegal except to save a women's life. For more than two decades the MR program was run as a vertical program. In 1998 the government of Bangladesh introduced the health and population sector program (HPSP) incorporating menstrual regulation into the essential services package. In wide availability, barriers such as distance to health facilities and transportation costs, unofficial fees, lack of privacy, confidentiality and cleanliness in public health facilities, and in some cases attitudes of service providers, are limiting access to MR services. Quality of care is compromised by inadequacies in infection control and in provider training and counseling. Health system weaknesses include gross under-reporting of cases by providers who do not wish to share unofficial fees, which affects monitoring and adequate provision of supplies. The HPSP has caused uncertainty regarding supervision in public sector facilities and adversely affected training by NGOs and government-NGO coordination.[6] Rationale of study: Millions of women around the world risk their lives and health to end unwanted pregnancies. The situation is no different in Bangladesh. Overall, one third of births in Bangladesh can be considered as unplanned. 19% are mistimed and 14% unwanted. Low contraceptive continuation rates, method failure and high unmet need for contraceptives are some of the leading causes of unwanted pregnancies and abortions. The issue under this study has important implications for the family planning program in Bangladesh. As noted, most of the women interviewed were not practicing contraception at the time they become pregnant, primarily because of side effects, fear of side effects or the inconvenience of contraceptive use. These concerns could be addressed to some extent by providing better counseling on, and management of side effects and by offering women more convenient access to a wide selection of methods. However, even with the implementation of such measures, some demand for pregnancy termination is likely to exist. As lack of proper knowledge about MR, its timing some of them come delay in seeking for menstrual regulation. But when they are rejected for MR they get frustrated and attempts to get rid of it by induced abortion by themselves or by untrained persons. This unsafe procedure results in serious forms of morbidity and extreme cases death may occurs due to septic abortion. In addressing future challenges the government plans to reduce maternal mortality by providing adequate support for antenatal care, post delivery services and emergency obstetric care. The government policy also emphasizes management of complication arising from unsafe abortions. This proposed

study will try to find out the causes of delay in care seeking behavior, thus the government may need to publicize the risks involved in delaying MR care seeking behavior of these women, so that service seekers can make safer choices.

MATERIALS AND METHOD

This cross sectional study was carried out among women at MR clinic, family planning unit of Institute of Child and Mother Health (ICMH), Dhaka, Bangladesh from December 2009 to May 2010 (Six months). Among the women 52 cases were selected purposively according to inclusion and exclusion criteria. The inclusion criteria of the study were women of reproductive age having amenorrhoea for more than 10 weeks and women agreeing to participate in this study. On the other hand, the exclusion criteria were women with molar pregnancy with sepsis and suffering from any associated medical diseases. Data was collected using a structured questionnaire containing all the variables of interest. The questionnaire was finalized following pre-testing. All women were informed about the purpose of the study and informed written consent was taken from all the study subjects after full explanation of nature and purpose of the study. Data were collected by interviewing and examining the patients MR clinic.

Data analysis and quality assurance

Statistical analyses were carried out by using the Statistical Package for Social Sciences version 16.0 for Windows (SPSS Inc., Chicago, Illinois, USA). The mean values were calculated for continuous variables. The quantitative observations were indicated by frequencies and percentages. It is extremely important that data was of good quality. Patient of incomplete abortion was the target group (within 12 weeks)

Ethical Implications

Permission for the study was taken from the concerned departments. All the study subjects were thoroughly appraised about the nature, purpose and implications of the study, as well as spectrum of benefits and risk of the study. All study subjects was assured of adequate treatment in relation to study purpose. Women were also assured about their confidentiality and freedom to withdraw themselves from the study any time. Data was collected in approved data collection form. Finally written consent of all study subjects were taken free of duress and without exploiting any weakness of subjects. The study subjects were informed verbally about the study design, the purpose of the study, and their right to withdraw them from the study at any time, for any reason, whatsoever. Subjects who gave informed consent to participate in the study were included as study sample.

RESULTS

Among the respondents 94% were married and 6% were divorced. Occupation respondents; 75% were house wives, 19% were laborer, 4% were service holder and 2% were in business. The mean age of marriage of the respondents was 19.5 and 42% were married during 17 to 20 year. Regarding the family income, 67% husbands of respondents were the only earning member of the family and both husband and wife were 25%; however 56% family's monthly income were within 3001-5000 taka, 29% was more than 5000 taka, 11% family's income were 1000-3000 taka and only 4% family's income was within1000 taka.

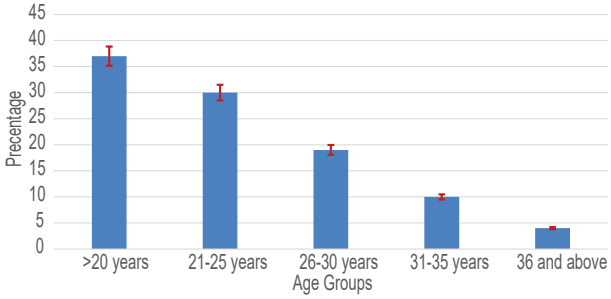


Figure- 1: *Distribution of the respondents by age (n= 52)*

Figure 1 shows the distribution of age of the respondents, here 37% were in age group below 20 years, 30% were from 21-25 years, 19% were from 26-30 years, 10% were from 31-35 years and 4 % of the respondents were from above 35 years of age group. Mean age of the respondents was 22.14 years.

Table I states the respondents by level of education. It shows that 79% were illiterate, 11.5% were from Class I to V, 6% were from Class VI to X and 4% had passed SSC and above.

Table- I: Distribution of the respondents by level of education (n= 52)

Level of education	Frequency	Percent (%)
Illiterate	41	79
Class I-Class V	6	11.5
Class VI- Class X	6	6
SSC and above	2	4

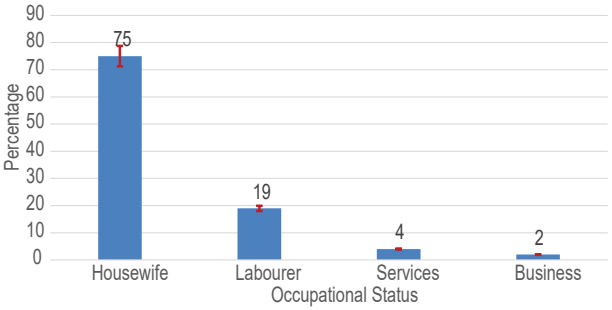


Figure- 2: *Occupational status of the respondents*

Figure 2 represents the occupational status of the respondents; here, 75% were house wives, 19% were laborer, 4% were service holder and 2%were businessman.

Table II describes the education level respondent's husband, here 37% passed class I to V, 33% were illiterate, 19% passed class VI to X and only 11% completed SSC and above level of education.

Table- II: Distribution of the respondents by their husband's education status (n= 52)

Level of education	Frequency	Percent
Illiterate	11	33%
Class I - V	19	37%
Class- VI - X	10	19%
SSC and above	6	11%

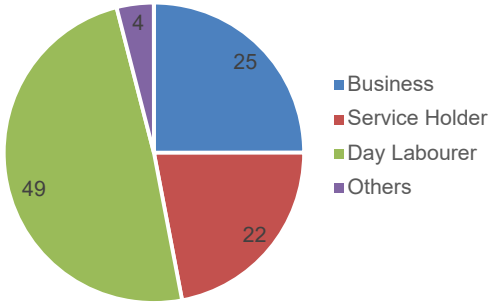


Figure- 3: D*istribution of the respondents by their husband's occupation status (n= 52)*

Figure 3 showing the distribution of the respondents by their husband's occupation, here 49% were day laborer, about 22% were service holder, 25% were business and rest 4% were from other occupation.

Table III shows the distribution of respondents by age at first marriage. The mean age of their first marriage was 19.5. Among the respondents 19% of them got married at and before 16 years. Usual age of marriage 17 to 25 years was found in 69% of respondents and others 12% got married by 26 to >30 years.

Table- III: Distribution of the respondents by their age at first marriage (n= 52)

Age in years	Frequency	Percentage (%)	Mean
<16 Years	10	19	
17-20	22	42	19.5
21-25	14	27	
26-30	5	10	
>30	1	2	

Table IV shows that 67% husbands of the respondents were the only earning member of their family, both husband and self was 25% and only self was 4%.

Table- IV: Distribution of the respondents by earning member in the family

Earning member	Frequency	Percent (%)
Only self	2	4
Only husband	35	67
Both	13	25
Son	1	2
Daughter	1	2

Table V states that 56% had monthly family income 3001-5000 taka, 29% had more than 5,000 Taka, 11% had 1000-3000 taka and 4% had 1000 taka or less.

Table- V: Distribution of respondents by monthly family income

Monthly income	Frequency	Percent
Up to 1000 taka	2	4
1000-3000 taka	6	11
3001-5000 taka	29	56
>5000 taka	15	29

Table VI states that 73% women had 1- 3 children, whereas 16% had 4 - 5 children and 11% had no children.

Table- VI: Distribution of respondents by number children

Number of children	Frequency	Percent
Nil	6	11
1	9	17
2	13	25
3	16	31
4	5	10
5 and >above	3	6

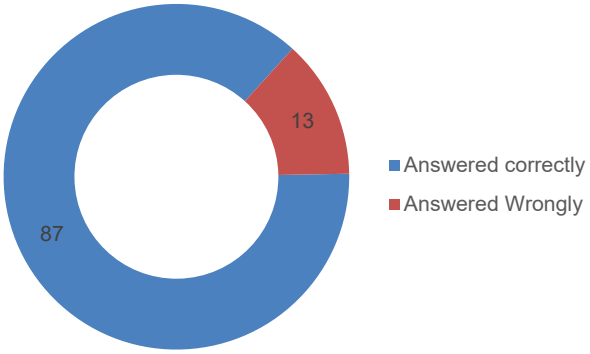


Figure- 4: Distribution of respondents who answered correctly about advantages of MR

Figure 4 illustrate the distribution of respondents who answered correctly about advantages of MR; 87% answered correctly about advantages of MR and 13% could not answer correctly.

Table VII shows the distribution of respondents by source of information about MR, here 65% received information form relatives/neighbors, 25% from health workers and 10% from mass media/ others.

Table- VII: Distribution of respondents by source of knowing about MR

Source of knowing	Frequency	Percent
Health workers	13	25
Radio/TB	2	4
Relative/neighbor	34	65
Others	6	6

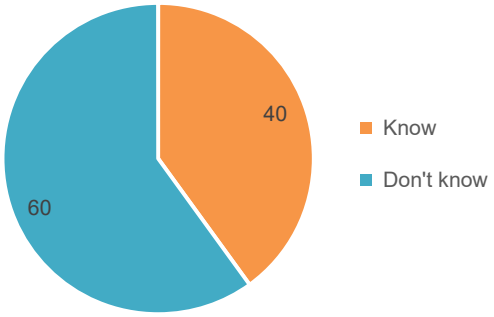


Figure- 5: showing that 60% didn't know about the proper time of performing MR after cessation of menstruation.

Figure 5 showing that 60% of the respondents didn't know the proper time of attend MR after cessation of menstruation.

Table VIII shows the distribution of respondents by their knowing about legal aspects of MR; here 63% didn't know about its legalization.

Table- VIII: Distribution of respondents by their knowing about legal aspects of MR

legal aspects	Frequency	Percent
Don't know	33	63
Know	19	37
Total	50	100

Table IX states that 85% knew about the side effects of MR and 15% respondents didn't know.

Table- IX: Distribution of respondents by knowledge about side effects of MR

Knowledge of Side effects	Frequency	Percent
Have knowledge	44	85
No knowledge	8	15
Total	52	100

Table X shows the distribution respondent about their knowledge on patterns of adverse effects of MR, here 37% told about excessive bleeding, 33% pain, 8% sterility, 6% perforation and rest of them told about infection.

Table- X: Knowledge about the patterns of adverse effects of MR

Side effects of MR	Frequency	Percent
Excessive bleeding	19	37
Pain	17	33
Infection	2	4
Perforation	3	6
Sterility	4	8

Table XI shows the distribution of respondents by reasons of delay in care seeking for MR, here 56% had personal reasons, 19% had social, 15% had service related and rest 10% had familial reasons.

Table XI: Distribution of respondents by reasons for delay in care (n= 50)

Causes for delay	Frequency	Percent
Personal	29	56
Family	05	10
Social	10	19
Service	08	15
Total	50	100

Table XII states distribution of respondents by personal reasons of delay in MR, here 51.72% delayed due to take oral tablets for abortion, 41.37% failed to understand about the amnaeorrhoea and rest 6.9% didn't know health facility for MR service.

Table- XII: Distribution of respondents by personal reasons (n=29)

Personal causes	Frequency	Percent
Failed to understand about the pregnancy	12	41.37
Took oral tablets for abortion	15	51.72
Don't know where get MR service	2	6.9
Total	29	100

Table XIII shows distribution of respondents by family reasons, 60% pointed out the security problem, 20% husband's absence and rest 10% specified security problem of the house as the reasons for delay.

Table- XIII: Distribution of respondents by family reasons (n= 5)

Family causes	Frequency	Percent
Resistance by husband/others	1	20
Husband absent	1	20
Security problem of the house	3	60
Total	05	100

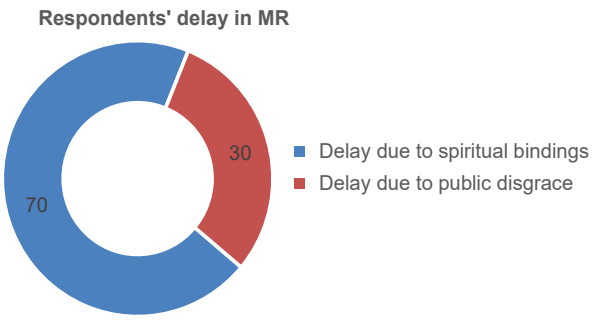


Figure- 6: *Showing the social reasons for delay of seeking care for MR; delayed due to spiritual bindings and fear of public disgrace.*

Figure 6 illustrate the social reasons for delay of seeking care for MR, here 70% delayed due to spiritual bindings and rest 30% due to fear of public disgrace.

Table XIV states the distribution of respondents by service center related reasons, 62% stated delay due to treatment cost, 25% due to distances of center and 13% of them told substandard services.

Table- XIV Distribution of respondents by service centre related causes

Service/service centre related causes	Frequency	Percent
Treatment cost	05	62
Distances of centre	02	25
Substandard service	01	13
Total	08	100

DISCUSSION

The termination of pregnancy by willful means has always created dilemmas for civil societies. Many citizens abhor the practice, other support the right of women to make their decisions; no one seems to be neutral on the subject. Menstrual regulation (MR) an early termination within 6-10 weeks without pregnancy confirmation is widely available in Bangladesh through public, NGO, and private sector facilities, even though abortion is illegal except to save a women's life.

This cross-sectional study was carried out to know the factors causing delay in care seeking behavior of menstrual regulation among fifty women in selected MR clinic in institute of child and mother health. The study was done with the objective to find out the personal and social factors for delay in seeking MR care and to find out the level of knowledge about MR like complication, advantages, disadvantages, indication, proper time of receiving MR and its Complication.

The mean age of respondents was 22.14 years. One study showed that the mean age of the MR clients was 26 years.[2] and few other study results stated the mean age of MR clients was 24 year. [23, 24] this findings showed that the MR clients were almost in the middle of their reproductive life. Most of them were married and 4% were divorced as their husbands left them after they conceived. The mean age of marriage was 19.5 years. Seventy five percent were housewives and 79% were illiterate. In 67% cases husbands were the only earning member.

The decision making process for MR by these uneducated, housewives women could not made by themselves, their elder family member played an important role. Women

were undecided in their decision to terminate pregnancy which leads to delay in seeking MR. The study showed that thirty seven percent of the respondent's husband's educational level was calss1 - class5 and 49% of them were day laborer, 22% were service holder and rest do small business. The monthly family income of the respondents was within 3000-5000 taka, in 56% cases. This indicates that the clients were poor. This findings was similar to the Bhuiyan and Begum.[24] Most of them having 1-3 for doing MR. living child, on the other hand 11% respondents had no living child still came

Similar to other study the study finding suggests that problems in suspecting a pregnancy were an important cause of delay[12, 21] with irregular periods and poor recall and recording of menses. Resulted in difficulties recognizing pregnancy symptoms, which if identified earlier may have prompted women to confirm a pregnancy sooner. In the study about 41% were failed to understand about pregnancy as their cycle was irregular and took irregular oral contraceptive pill. About 83% respondents used family planning methods and of them majority 72% were pill users. But most of then took irregular OCP and inject able contraceptive though, 91% stopped contraceptive method before the present pregnancy. Despite limited use of contraceptive method, women did not make link between amenorrhea and pregnant On the other hand women experienced difficulties in detecting a pregnant with at least two months elapsing prior to pregnancy confirmation. This s result similar with findings of Harries et al. study.[22]

The study findings suggest that 87% knew about advantage of MR as it is safe for health, less chance of infection. Of them 70%pointed out excessive bleeding and pain as disadvantages of MR. the respondents said that they learnt about MR from relatives or NGO workers. But the study showed that though they had knowledge about MR, 65% don't know about its legal aspect. They did not consider it as their "right". And most were not aware of the time restrictions involved. [12]

Most women described multiple barriers to obtaining MR early and did not identify one reason as being more important than another. Women tended to relate more too personal (58%), social (18%) issues than service related barriers (14%).[12, 22] When the respondents confirm about their pregnancy at first majority (51%) tried home abortion by taking gynaecosid, cytomis, emergency pill or other abortificient drugs and when they failed they were already delay. The study showed that majority in this group belong to age group of less than 20 years.

This study revealed several important shortcomings in the health care system and with regards to MR care provision. Initial delays in suspecting pregnancy was underscored by further delays once women decided to have MR. Delays due to inappropriate referral evidenced by women attending numerous facilities before obtaining MR, waiting periods of over two weeks and difficulties locating a facility providing second trimester abortions is concerning. Unofficial fees and substandard service of some MR centre was also a factor for delaying.

Women intimated that reproductive choice was often difficult, particularly in a climate of judgmental and negative attitudes displayed by healthcare providers. Opportunities for values clarification training designed to promote more tolerant attitudes by service providers should continue and extend to health care providers working within all areas of reproductive health. Such interventions would play an important role in improving the quality of care and long term health outcomes of women seeking MR.

Limitation of the study

- Purposive sampling was done due to time constrain.. So, this result may not be representative to whole country.
- The study design was taken as a cross sectional one, though a comparative study would be more suitable for this topic.

CONCLUSIONS

The main social causes of delaying MR due to spiritual bindings and fear of public disgrace. Unofficial fees and insecurity of the house were the factors among the service related and familial causes. The study also showed that though that they had satisfactory knowledge about MR, they were unaware about its legalization and proper timing for doing it.

RECOMMENDATION

Information on the availability of MR services particularly the time restrictions and about its legal aspects should be included in reproductive health care counseling, so that women with unintended pregnancies are able to make informed choices. To contribute the achievement of the MDG 5 target to reduce the maternal mortality ratio by 75% from 1990-2015, quality of MR services should be

improved and made easily available to the rural people, where the mortality and morbidity due to abortion is high. For this purpose more mass advertisement should be present.

REFERENCES

1. Mitra SN et al. Bangladesh Demographic and Health Survey, 1993-1994, Dhaka: Mitra and Associates, 1994.
2. Dixon- Mueller R, innovations in reproductive health care: Menstrual regulation policies and programmes in Bangladesh, studies in family planning, 1988, 19 (3): 129-140.
3. Islam S, Indigenous abortion practitioners in rural Bangladesh, women abortionists: their perceptions and practices, Dhaka: Narigrantha Probartana, 1992.
4. Olukoya AA, kaya, Ferguson BJ, Abou Zahr c. unsafe abortion in adolescents. Int J Gynaecol obstet 2001 Nov; 79
5. World Health Organization (WHO). World health report 2005. Geneva, Switzerland: WHO; 2005
6. Choddhury SN, Moni D.Reproductive Health Maters, 2004; 24:95-10.
7. Sedgh G. Henshaw s, Singh s, Ahman and shah IH Induced abortion rates and trends worldwide Lancet 2007;370:1338-45.
8. Amin S, Menstrul regulation in Bangladesh, paper presented at the international union for scientific study of population (IUSSP) seminar on sociocultural and political Aspects of abortion from an Anthropological perspective, Trivandrum, india, Mst.25- 28.1996.
9. "Legal abortion worldwide: incidence and recent trends", international family planning perspectives 33:106-116,September 2007.
10. Initiative to strengthen national MR programme in Bangladesh, launching ceremony, 23june, 2008, Dhaka, Bangladesh.
11. World health organization (who) world report, 2005, geneva, Switzerland: who: 2005
12. World health health organization (WHO).Reduction of metermal mortality: a joint WHO/UNFPA/ UNICEF/WORLD BANK Statement. Geneva, Switzerland: WHO; 1999.
13. Fusun A 1, Rukiye G, Mahir I, and Murat Y. Abortion in turkey:women in rural areas and the law. Br. J Gen Pract. 2008 may 1:58(550):370373.
14. Boonstra HD et al. Abortion in women's lives new York GUTTMACHER institute, 2006.
15. Bracken MB, Kasl SD,Delay in seeking induced abortion: a review and theoretical analysis. Am J Obstet Gyneclo, 1975 April 1; 121(7):1008-19.
16. Fielding WL, Sachteben MR, Friedman LA, Friedman EA. Comparison of women seeking early and late abortion. Am J Obstet Gynecol, 1978 june 1; 131(3): 304-10.
17. Finer LB and Henshaw SK, Disparities in rates of unintended Pg in the united states, 1994 2001, perspectives on sexual and reproductive health, 2006, 38(2):90-96.
18. Jones RK et al. Abortion in theus: incidence and access to services, 2005, perspective on sexual and reproductive health, 2008, 40(1):6-16.
19. Ketting E.Second-trimester abortion as a social problem: delay in abortion seeking behavior and its causes. The Hague, Netherlands, Martinus Nijhoff, 1982,:12-9. (Boerhaave series for postgraduate Medical Education vol.22).
20. Morroni C. Myer L, Tibazarwa K: Knowledge of the abortion legislation among South African women: a cross-sectional study.
21. Morroni C, Moodley J: Characteristics of women booking for first capetown.SAJOG2006, 12(2):81-82, and second trimester abortions at public sector clinics in
22. Harries J, Orner P, Gabriel M and Mitchell E. Delays in seeking an abortion until the second trimester; a qualitative study in south Africa. Reproductive Health 2007, 4:7doi:10.1186/1742-4755-4-7.
23. Akhter et al. Demographic pattern of MR news letter, BAPSA. may 1995:2:25-19.
24. Bhuiyan N and Begum S.Experience with menstrual regulation and family planning services in Chittagong medical college Menstrual hospital between October 78 to july 79. A bibliography on Menstrual regulation and abortion studies in Bangladesh, BIRPERHT. 1996:149-152.

Bangladesh Med J. 2022 May; 51(2)
DOI: https://doi.org/10.3329/bmj.v51i2.69256

Original Article

Outcome and Indication of Caesarean Section amongst Pregnant Women Experiencing Premature Rupture of Membranes

* Nahar S[1], Sultana S[2], Yeasmin S[3]

Abstract

Premature rupture of membranes (PROM) is characterized by the spontaneous rupture of chorioamniotic membranes more than one hour before the onset of labor. This condition typically arises spontaneously in most cases, affecting a significant portion of pregnancies. Notably, PROM can also occur in full-term pregnancies. This cross-sectional follow-up study was conducted among pregnant women had premature rupture of membranes and experiencing Caesarean Section (CS) in the department of Obstetrics and Gynaecology of Dhaka National Medical College Hospital (DNMCH), Dhaka, Bangladesh during the period of March to August 2011. The main aim of the study was to find out the indication and outcome of pregnant women with PROM and completed CS. A total of 90 data were collected purposively from all pregnant women more than 28 weeks of gestational age with PROM admitted in the Department of Obstetrics and Gynaecology, DNMCH, Dhaka for labour and underwent CS during study period. The data were collected using a semi-structured data sheet through direct questioning of the patients and physical examinations. Daily follow-ups were conducted until the patients were discharged, and data were also obtained from the clinical records of the patients. PROM patients encompassed all age groups, with ages ranging from 18 to 38 years. The overall educational level of the participants was low, with less than two-third (61.1%) belonging to the low socio-economic status. The average gestational age was 36.65 weeks, with 53.3% being primigravida, 45.6% being multigravida and grand multipara was 1 (1.11%). Only two had multiple pregnancies, and 11 respondents had experienced per vaginal bleeding. During previous gestations, 20 had a history of Caesarean section, 12 had experienced abortion, and 2 had previous cases of PROM. Nutritional deficits were found in 36.7% of patients, Pregnancy Induced Hypertension (PIH) in 35.6%, infections in 12.2%, and chronic hypertension in 5.6%. Four foetuses were in breech presentations, one had a single compound presentation, and two had a transverse or oblique lie. All the women were experiencing gushing of fluid per vagina, with one-fifth (20.0%) having meconium-stained and 12.2% blood-stained vaginal discharge. Attempts to prolong pregnancy were not very successful, with the longest duration being 75 hours. Caesarean sections had to be performed in all cases, with 34.4% within 24 hours and 41.2% within the next 24 hours. Elective caesarean sections following PROM were 28.9%. Indications for emergency caesarean section included a previous history of Caesarean section in 19 cases, foetal distress was found in 18 cases, failed induction in 7 cases, chorioamnionitis in 6 cases, foetal malpresentation was in 5 cases, and other reasons in 9 cases. More than one-third (35.56%) respondents had morbid condition to complicate the postpartum period. Among the complications, 21.11% suffered from wound infection; followed by puerperal sepsis 8.89% and postpartum haemorrhage 5.56%. At termination, all 92 foetuses were alive, but 6 babies had an apgar score <7 at 5 minutes after delivery, 30.4% of babies had low birth weight and 73.9% were in good condition, whereas 26.1% were admitted in neonatal ward, and out of the admitted 7 died with neonatal sepsis being the primary cause of death. A better understanding of the diagnosis babies and management of PROM will enable obstetric care providers to optimize perinatal outcomes and minimize neonatal morbidity and mortality. Therefore, this study finds the indication and outcome of caesarean section in pregnant women experiencing PROM.

Keywords: *Premature rupture of membranes, caesarean section, pregnant women.*

1 *Dr. Sabikun Nahar, Medical Officer, Department of Gynecology and Obstetrics, Sheikh Hasina National Burn & Plastic Surgery Institute (SHNBPSI), Dhaka. Email: drsabikunsbmc30@gmail. com
2 Dr. Sohana Sultana, Department of Gynecology and Obstetrics, Assistant Surgeon, 250 Bed, General Hospital, Munshiganj.
3 Dr. Sabina Yeasmin, Department of Gynecology and Obstetrics, Junior Consultant, OCC, DMCH.
* For Correspondence

INTRODUCTION

Premature rupture of membranes (PROM) is a significant obstetric problem in pregnancy that has a major impact on

foetal and maternal outcome. It is one of the common clinical events which may occur in any time during pregnancy and where normal pregnancy can turn into high-risk situation for mother as well as foetus. Premature rupture of membranes (PROM) is defined as spontaneous rupture of (chorioamniotic) membranes more than 1 hour before the onset of labour.1 PROM affects 2.7-17% of all pregnancies and in most cases happens spontaneously.[1] PROM occurs in approximately 8% of term pregnancy.[2] PROM is responsible for about 35% of all preterm delivery and its consequences.[1] Forty six percent (46%) women developed labor pain between 1-15 hours of rupture of membranes and another 26% developed pain between 15-30 hours.[2,4,5] Infection is the most common cause of PROM.[2,3,8] Subclinical infection, high blood sugar level, over distension of abdomen decrease tensile length of foetal memebrane.[7] Chorioamnionitis is an important sequel of PROM and may precede endometritis or puerperal sepsis. PROM also increases the risk of caesarean section and duration of stay in hospital.[8, 9] Treatment of PROM after confirmation of diagnosis depends the gestational age and risk of infection. The best outcome depends on several factors among which are gestational age, evidence of foetal disease, initiation of labor, anti-partum sepsis and condition of the cervix.[10] There has been increasing incidence of Caesarean section during last two decades to extent from about 5% to more than 20% among hospital delivery. Thus, incidence depends on different indications, which is now diagnosed and detected early and reduces the foetal maternal morbidity.[11] Labor and delivery may be a severe insult to preterm PROM infant. This has led to suggestion that Caesarean section should be used to delivery infants less than 1.5 kg irrespective of their presentation. This is a controversial subject and there is no solid evidence that Caesarean section is better suggestive proposition.[12] Caesarean section is a powerful intervention and contributing the best chance to preterm baby with foetal distress, CPD, prime breach and mal-presentation. Preterm breech probably benefits to some extent from Caesarean section. Actually our aim should be to continue the pregnancy up toten in preterm PROM and managed normally but due to unavoidable circumstances for saving the life of the mother or foetus, an interventional procedure that is Caesarean section has to be done immediefly.[13] As the study will explore the pre-mature rupture of membrane patients and record maternal and child outcome in a tertiary hospital of Bangladesh, it has several policy implications in terms of resource (human, financial, and informational) allocation and utilization. This information is vital to plan for antenatal obstetrics care in Bangladesh and other similar settings.

MATERIALS AND METHODS

This was a hospital based cross sectional followup study. The study was carried out in the department of Obstetrics and Gynaecology of Dhaka National Medical College Hospital, Dhaka, Bangladesh. The study was conducted over a period of 6 (six) months from March to August 2011. Study population was the all women with premature rupture of membrane (PROM) with more than 28 weeks of gestational age underwent caesarean section without labour admitted in the Department of Obstetrics and Gynaecology, DNMCH, Dhaka during study period. The sample size for this study was 90 cases. The respondents for the study were selected purposively from the study population depending on their willingness to participate in the study. The inclusion criteria were primi and multi-gravida with PROM, gestational age more than 28 weeks and spontaneous rupture of membrane before initiation of labor. On the other hand, the exclusion criteria were patients with rupture of membrane with established labor, rupture of membrane with anti-partum haemorrhage (APH) and severe pre-eclampsia and eclampsia. A preformed data sheet was prepared for data collection. After admission, full history including particulars of the patient, duration of pregnancy, time and onset of rupture of membrane, past obstetric history was taken. Gestation was determined from last menstrual period (LMP) and from early USG. Examination of pulse, blood pressure (BP), fundal height, uterine contraction, and fetal condition was recorded. Sterile per vaginal examination was done to assess cervical dilatation, effacement and for progression of labor according to standard protocol. The data was collected by questioning the patients and by physical examination, daily follow up patients till their discharge and also from clinical records of the patients. At the end of an interview a cross-check was performed to detect and gather missed data. Code fills up in each completed datasheet at the end of each working day. Regular entry of each fully completed questionnaire using the SPSS program. After collection of data, those were edited through checking and rechecking. Data analysis was done by computer aided statistical software SPSS. Data was presented in the form of tables and graphs. Data was analyzed with descriptive statistics and bi-variate analysis. The level of significance of 0.05 was used for this study.

Ethical Clearance

Ethical clearance this study was taken from the Ethical Review Committee of DNMCH. After getting written permission from the concerned authority of the selected Institute, the patients were approached and their interview was taken.

RESULTS

Socio-demographic information

During the study period 98 pregnant women with PROM and completed CS were selected from the obstetric ward at DNMCH, among them data were collected from 90 subjects who agreed to participate in this study.

Table I shows the distribution of participants in age group. Age range of the participants was 18 to 38 years and mean age was 24.44 years and SD = 4.089. Among the women 53.3% was in the age group 21 to 25 years. Others 24.4%, 17.8% and 4.4% were in age group 26 to 30 years, up to 20 years and more than 30 years respectively.

Table- I: Distribution of the participants by their age (n = 90)

Patients	Frequency	Percent
Up to 20 yrs	16	17.8
21 to 25 yrs	48	53.3
26 to 30 yrs	22	24.4
More than 30 yrs	4	4.4
Total	90	100.0

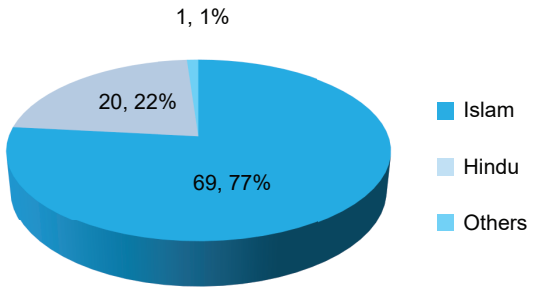


Figure- 1: *Distribution of the participants by their religion*

Figure 1 illustrates the distribution of the participants by their religion, 69 (76.7%) were Muslim; 20 (22.2%) respondents were Hindu and the remaining 1 (1.1%) belonged to other religion.

Table II states the educational level of the participants. Here 51.1% of the respondents had no education, 35.6% had primary level of education and 13.3% had secondary and above.

Table- II: Distribution of the participants by their educational status

Educational status	Frequency (n)	Percent (%)
Illiterate	46	51.1
Primary	32	35.6
Secondary	11	12.2
Tertiary	1	1.1
Total	90	100.0

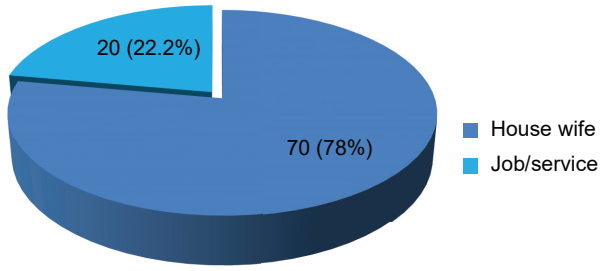


Figure-2: *Distribution of the patients by their occupation (n=100)*

Figure 2 indicates that 70 (77.8%) were housewives and the remaining were employed (house- keeper, garments worker, teacher, NGO jobs and government service).

Table III states that 61.1%) of the cases belonged to low socio-economic status following 18.9% lower middle class, middle class 17.8% and 2.2% was upper-middle class.

Table- III: Distribution of the participants according to their socio-economic status

Socio-economic status	Frequency	Percent
Low	55	61.1
Lower middle	17	18.9
Middle class	16	17.8
Upper middle class	2	2.2
Total	90	100.0

Table IV shows that the gestational age of the participants ranged from 34 completed weeks to 40 weeks plus 2 days with average gestational age of 36.65 weeks. Here 85.5% respondents had 37-40 weeks of pregnancy, 7.8% had less than 37 weeks and 6.7% had 40 weeks or more.

Table- IV: Distribution of the participants by their gestational age (n= 90)

Gestational age	Frequency	Percent
< 37 weeks of gestation	7	7.8
37-40 weeks of gestation	77	85.5
40 weeks of gestation + 2 days	6	6.7
Total	90	100.0

Mean 36.65; Median 38; Mode 38; SD 10.998; Range 34 weeks - 40 weeks and 2 days

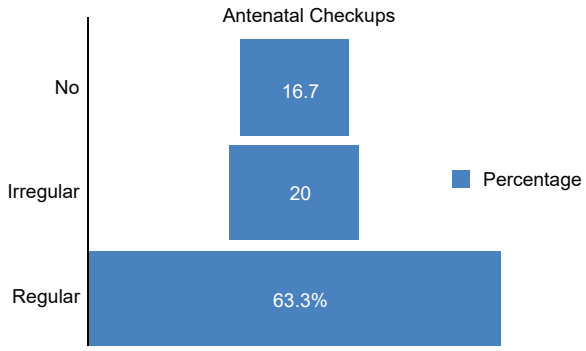


Figure- 3: *Distribution of the participants by their antenatal checkups*

Figure 3 illustrates that 57 (63.3%) of the respondents had regular ante-natal checkups, while 18 (20.0%) were irregular and remaining 15 (16.7%) had never attended any ANC centre during current pregnancy.

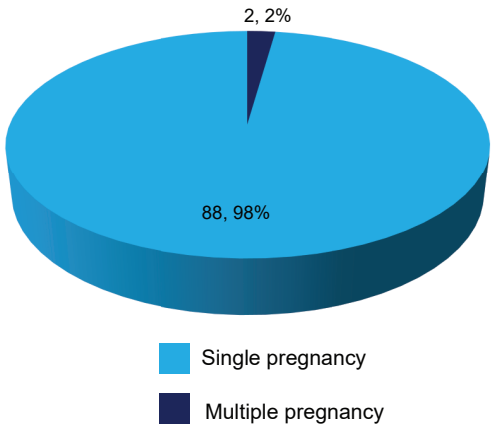


Figure- 4: *Distribution of the participants by their number of foetus*

Figure 4 shows that 2 (2.2%) of the respondents had multiple pregnancies and the rest were single pregnancy.

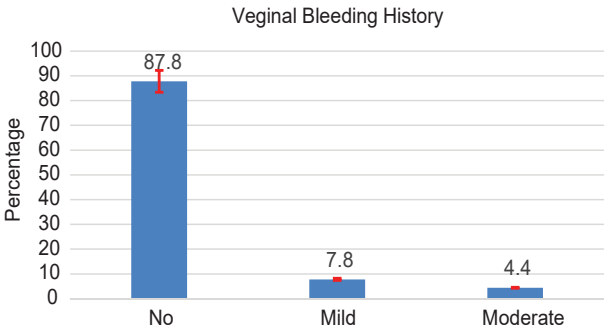


Figure-5: *Distribution of the participants by per vaginal bleeding*

Figure 5 shows that, 79 (87.8%) of the respondents had no per vaginal (PV) bleeding, whereas mild PV bleeding was found in 7 (7.8%) and the remaining 4 (4.4%) had moderate PV bleeding per vagina.

Table V shows that 93.3% respondents experienced regular cycle where the rest were irregular.

Table- V: Distribution of the respondents by their type of menstrual cycle.

Type of cycle	Frequency (n)	Percent (%)
Regular	84	93.3
Irregular	06	6.7

Table VI shows that 36 (40.0%) respondents had never used any contraceptive method, 45 (50.0%) had used only oral pill, injection method was used by 7 (7.8%) respondents and 2 (2.2%) had used intra uterine devices (IUD).

Table- VI: Distribution of the respondents by their practicing birth control methods and the type of method

		Birth control		Total
		Yes	No	
Method	No method	0	36	36
	Pill	45	0	45
	Injectable	7		
	IUD	2	0	9
	Total	54	36	90

Table VII shows that 81 (90.0%) of the PROM patients were suffering from various medical conditions. Among them, nutritional deficit was found in 33 (36.7%), followed by 32 (35.6%) from pregnancy induced hypertension (PIH, eclampsia and pre-eclampsia), 11 (12.2%) from Infections (UTI, Lower genital tract infection) and 5 (5.5%) were suffering from chronic hypertension n f PROM Patients.

Table- VII: Distribution of the respondents by their pre-existing medical conditions (n= 90)

Diseases	Frequency (n)	Percent (%)
Nutritional deficit	33	36.7
PIH	32	35.6
Infections (UTI, Lower genital tract infection)	11	12.2
Chronic hypertension	5	5.5
Total	81	90.0

Table VIII shows that the primigavida was 48 (53.33%), multigravida was 41 (45.56%) and grand multipara was 1 (1.11%).

Table- VIII: Distribution of the respondents by their number of Gestations (n= 90)

Number of gestations	Frequency (n)	Percent (%)
1 Primigravida	48	53.33
Multigravida	21	23.33
	12	13.33
	4	4.45
	4	4.45
Grand multipara (> 5 pregnencies)	1	1.11
Total	90	100.0

Table IX shows the general condition of the patients at admission. All of them were anaemic; 33 (36.7%) moderate to severe anaemia and 44.4% of them had oedema; 43.3% patients had tachycardia, 41.1% were hypertensive and 21.1% had raised temperature.

Table- IX: Distribution of the respondents by their general condition at admission (n = 90)

Anaemia	Frequency	Percent
Mild	57	63.3
Moderate to severe	33	36.7
Oedema		
Absent	50	55.6
Present	40	44.4
Pulse/min		
<100	51	56.7
≥100	39	43.3
BP		
Hypertension	37	41.1
Normal	53	58.9
Temperature		
Normal	71	78.9
High	19	21.1
Total	90	100.0

Table X shows per vaginal examination, here all (100%) of the respondents experienced 'gushing of fluid per vagina'; 61 (67.8%) of the women had turbid colored discharge; 18 (20.0%) had meconium stained and remaining 11 (12.2%) had blood stained vaginal discharge.

Table- X: Distribution of the respondents by their condition in per vaginal findings

Leakage	Frequency (n)	Percent (%)
Gushing of fluid per vagina	90	100.0
Colour of discharge	Frequency (n)	Percent (%)
Turbid	61	67.8
Meconium stained	18	20.0
Blood stained	11	12.2
Total	90	100.0

Table XI shows the distribution of the respondents by their foetal position; 83 (92.22%) foetuses found as cephalic presentation, 4 (4.44%) had breech presentations, 2 (2.23%) had transverse compound presentation and remaining had transverse/ oblique lie.

Table- XI: Distribution of the respondents by their foetal presentation

Presentation	Frequency (n)	Percent (%)
Cephalic	83	92.22
Breech	4	4.44
Transverse/oblique	2	2.23
Compound	1	1.11
Total	90	100.0

Table XII explains that, 31 (34.4%) patient's delivery prolonged for less than 24 hours, 37 (41.2%) for 24-48 hours and 22 (24.4%) for more than 48 hours, but the duration did not exceed 75 hours.

Table- XII: Distribution of the participants by delay in delivery

Delay in delivery	Frequency (n)	Percentage (%)
<24 hours	31	34.4
24-48 hours	37	41.2
> 48 days	22	24.4
Total	90	100.0

Mean 1.2 days; Median 1.1 d; Mode 1.1 d; SD 0.937; Range 4 hrs-75 hrs

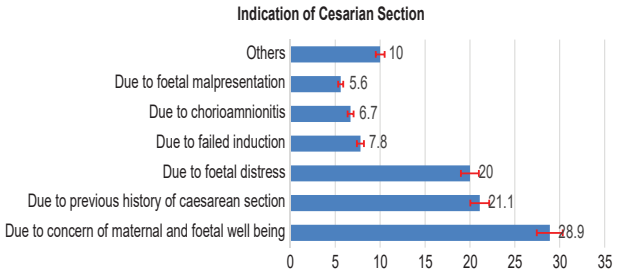


Figure-6: *Distribution of the respondents by the indication of C/S*

Figure 6 illustrates the distribution of the respondents by the indication of C/S; here all the babies (100%) were delivered by cesarean section. Elective C/S of patients following PROM was due to concern of maternal and foetal wellbeing counted for 26 (28.9%). Indications for abdominal delivery C/S) among the others were as follows- previous history of caesarean section 19 (21.1%), foetal distress 18 (20.0%), failed induction 7 (7.8%); chorioamnionitis 6 (6.7%), foetal malpresentation 5 (5.6%) and others 9 (10.0%).

Table XIII shows the distribution of the participants by their puerperal complications, here total 32 (35.56%) had morbid condition to complicate the postpartum period. Among the complications, 19 (21.11% suffered wound infection; followed by puerperal sepsis 8 (8.89%) and postpartum haemorrhage 5 (5.56%).

Table- XIII: Distribution of the participants by their puerperal complications (n= 90)

Complications	Frequency (n)	Percentage (%)
Wound infection	19	21.11
Puerperal sepsis	8	8.89
Postpartum haemorrhage	5	5.56
Total	32	35.56

Figure 7 illustrates the distribution of the respondents by their foetal outcome, here out of the 90 respondents; pregnancy outcomes of pregnant women with PROM at discharge from the hospital, there were 92 alive babies and 68 (73.9%) were in good condition, 24 (26.1%) had to be admitted for neonatal care. Among the babies at neonatal care (226.1%), 19 (20.7%) recovered and 5 (5.4%) died. Neonatal sepsis was the prime cause of death.

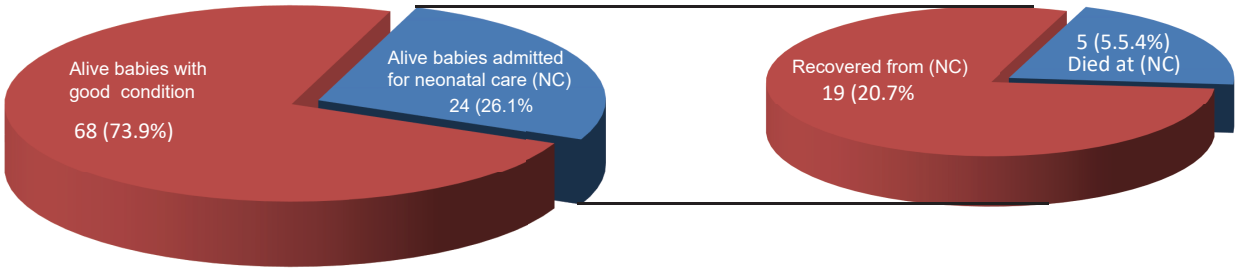


Figure- 7: *Distribution of the respondents by their foetal outcome*

DISCUSSION

This study was aimed at reporting the outcome and indications of caesarean section in PROM among women in Obstetric ward of DNMCH. Data were collected from 90 respondents who were admitted during March 2011 to September 2011. In this study, mean age of PROM cases was 24.44+4.09 years with a range of 18-38 years. Mondal BR. found mean age of PROM cases was 23 years with a range of 21-25 years.[27] Akter et.al 2010 found mean age 27.24±6.4 years with a range of 15-40 years.

In our study, 76.7% patients were Muslim, 22.2% were Hindu and remaining 1.1% belonged to other religion. The ratio of Hindu patients was similar to their existing proportion in the population of the country. On the contrary another study in Barisal found the ratio of Hindu patients were relatively higher than their existing proportion in the population of the country because in that district number of Hindu population is more.[27]

Socioeconomic status is reflected through the education of mothers, occupation, and monthly income of the family. In this study the overall educational level of the participants were poor, more than half (51.7%) of the patients had no education and 35.6% had primary education. These results are not very different in comparison to educational status of our country where literacy rate is about 55% and female literacy rate is about 49.8% (age is 15 years and above).

About 77.8% were housewives and remaining (22.2%) were employed (house keeper, garment worker, teacher, NGO jobs and government service). Among the husband of the participants three-fourth earned daily. Majority of the respondents (61.1%) belonged to low socioeconomic status. In comparison to another study which showed PROM occur more in low socioeconomic condition.[33]

Studies showed that (60-80%) cases of PROM occurred in term pregnancy and (20-40%) cases occur before 37 weeks of gestational age.[31, 32] Our study shows that 85.5% patients experienced PROM in 37-40 weeks of gestation, which is more than their studies. This may due to inclusion of both vaginal delivery and caesarean section cases in their studies.[33]

In our study, incidence of PROM was more in primigravida (53.3%). This may be explained by the fact that primigravida are more prone to labor dystocia and seek treatment in hospital. The distribution of patients in this present study does not correlate with other studies that found association of PROM with multiparity is about 62%.[34] Parity generally does not correlate with PROM.

In this study PROM, MR, abortion, caesarean section in a prior pregnancy is an identified risk factor for PROM in about 37.8% cases and lower genital tract infection, UTI and medical conditions like nutritional deficiency are also responsible for PROM in about 54.4% cases in comparison to another study which showed association of those risk factors were 56% and 72% respectively. Irregular antenatal checkup or antenatal checkup not at all increases the risk of PROM. In our study, 18.2% patients had irregular antenatal checkup and 16.7% had never attended any ANC centre during current pregnancy.

Study shows that most of the patients (85%) with term pregnancy and PROM will go into labor spontaneously within 24 hours, 15% will go into labor within 48 hours and 2-3% may have latent period exceeding 7 days.[32] In this study, about 34.4% pregnancy had to be terminated within 24 hours of establishment of PROM. 41.2% were terminated within next 24 hours. The remaining patients succeeded to prolong pregnancy for a period of more than 2 days but the duration did not exceed 75 hours.

In this study all the babies were delivered by caesarean section. Elective operation following PROM due to concern of maternal and foetal wellbeing counted for most (28.9%) caesarean section. Indication for abdominal delivery among the other were as follows: previous history of caesarean section (21.1%), foetal distress (20%), failed induction (7.8%), chorioamnionitis (6.7%), foetal mal-presentation (5.6%) and others (10%) In comparison to other studies that showed evidence of caesarean section. The indication of caesarean 43.7% (Mousiolis et. al 2011) and 47%.[32] section were failed induction (34.6%), breech presentation (15.4%), transverse lie (11.5%), foetal distress (15.4%), previous history of caesarean section, deep transverse arrest and cervical dystocia.

In this study 62% babies were born with Apgar score >7. Mean birth weight was 2.7± 0.4 kg. At discharge from the hospital most of the babies (73.9%) were in good condition but 26% had to be admitted in the neonatal ward. Majority of them recovered but only 5.4% died. Neonatal sepsis was the prime cause of death, compared to other studies showed by Cox et. al 1998, perinatal mortality is 20% and Mondal BR, a study in Barisal showed neonatal mortality is very high.[27]

Maternal morbidity following PROM is quite high. In my study 37.7% had a morbid condition to complicate the

postpartum period. Most of them suffered from wound infection (23.3%), puerperal sepsis (8.9%) and PPH (5.5%) which is compared to 5.9% shown by Hui, 201132. In this study there was no maternal death.

CONCLUSIONS

This study finds the risk factors for pregnancy like nutritional deficit, lower genital tract infections and UTI. Past obstetric history like history of caesarean section, previous history of PROM and abortion also plays role in causation of PROM. This study also demonstrates morbidities for PROM like wound infection, puerperal sepsis, and PPH. Regular antenatal care, growing awareness among the family and society, improving the socio-economic condition by taking appropriate measures in appropriate time can decrease the incidence of PROM. Another important finding of this study is neonatal mortality (5.4%) which can also be reduced by giving immediate paediatric support in all of those vulnerable cases.

RECOMMENDATIONS

A better understanding of the diagnosis and management of premature rupture of membranes will allow obstetric care providers to optimize perinatal outcome and minimize neonatal morbidity and mortality. A large scale multicenter study will generate new information of PROM in our country.

REFERENCES

1. William's Obstetric Gynaecology: pre-term labour rupture of the membranes, 19th edition: Appleton & Lange, California, USA: p 361.
2. Jones G: Pre-labour rupture of the membranes; Obstetrics &gynaecology - An evidence based text for MRCOG; Arnold Member of the hodder headline group, www.arnold-publishers.com; 1st edition; Oxford University Press; 2004; p 297,
3. Scharfe A, Crino JP. Pre-term labour and pre-labour rupture of the membranes. The John Hopkins Manual of Gynecology & Obstetrics; 2nd edition 2000; Lippincot Williams & Wikins, USA; p 123,
4. Sultana J, Chowdhury TA, Khan MH, Begum K. Amnoitic fluid index values after preterm premature rupture of the membranes and subsequent prenatal infection; Bangladesh Journal of Obstetrics and Gynaecology, 2005; 20(2) p 51-55.
5. Rana M, patra s, Puri M, Trivedi SS.Fetomaternal Outcome in Preterm Premature Rupture of Membrane. Int J Infertil Fetal Med 2014;5(1):18-21.
6. Roman AS, Pernoll ML. Late pregnancy complications. Current Obstetrics &Gynaecological Diagnosis and Treatment. 8th edition, Appleton & Lange, 1994. p 286-287.
7. McDonald HM, O'Loughlin JA, Jolley P, Vigneswaran R, McDonald PJ. Vaginal infection and preterm labour. Br J ObstetGynaecol. 1991; 98(5) :427-435. doi:10.1111/j.1471-0528.1991.tb10335.x
8. Delorme P, Lorthe E, Sibiude J, Kayem G. Preterm and term prelabour rupture of membranes: A review of timing and methods of labour induction. Best Pract Res Clin Obstet Gynaecol. 2021;77:27-41. doi:10. 1016/j.bpobgyn.2021.08.009.
9. Gafni A, Goeree R, Myhr TL, et al. Induction of labour versus expectant management for prelabour rupture of the membranes at term: an economic evaluation. TERMPROM Study Group. Term Prelabour Rupture of the Membranes. CMAJ. 1997;157(11):1519-1525.
10. Pre-labour rupture of the membranes at term: Section B Clinical guidelines, King Edward Memorial Hospital, Perth, Western Australia, January, 2008.
11. Mahtab A. Study of induction of Caesarean section in teaching hospital. BCPS. p 38-59.
12. Arias F. Practical guide to high risk pregnancy and delivery. 3rd edition. https://eboighar.com/en/books details/6454.
13. Dutta DC Konar H. Text Book of Obstetrics: Including Perinatology and Contraception. 6th ed. Calcutta India: New Central Book Agency; 2006; 20062004.
14. Artal R, Sokol RJ, Neuman M, Burstein AH, Stojkov J. The mechanical properties of prematurely and non-prematurely ruptured membranes. Methods and preliminary results. Am J ObstetGynecol 1976; 125 (5):655-9.
15. Skinner SJM, Campos GA, Higgins GC. Collagen content of human amniotic membranes: Effect of gestational length and premature rupture. Obstet Gynecol 1985; 66: 168.
16. Moore RM, Mansour JM, Redline RW, Mercer BM, Moore JJ. The physiology of fetal membrane rupture:

insight gained from the determination of physical properties. Placenta 2006;27:1037-51.

17. American College of Obstetricians and Gynecologists Committee on Practice Bulletins--Gynecology. ACOG Practice Bulletin. Clinical management guidelines for obstetrician-gynecologists. Medical management of abortion. Obstet Gynecol. 2001; 97(4):1-13.
18. Kenyon S, Boulvain M, Neilson JP. Antibiotics for preterm rupture of membranes. Cochrane Database Syst Rev. 2013;(12):CD001058. Published 2013 Dec 2. doi:10.1002/14651858.CD001058.pub3.
19. Preterm Prelabour Rupture of Membranes, Royal College of Obstetricians and Gynaecologists. Accessed: November 2006. https://www.rcog.org.uk/guidance/browse-all-guidance/green-top-guidelines/care-of-women-presenting-with-suspected-preterm-prelabour-rupture-of-membranes-from-24plus0-weeks-of-gestation-green-top-guideline-no-73.
20. Mercer BM, Goldenberg RL, Meis PJ, et al. The Preterm Prediction Study: prediction of preterm premature rupture of membranes through clinical findings and ancillary testing. The National Institute of Child Health and Human Development Maternal-Fetal Medicine Units Network. Am J Obstet Gynecol. 2000;183(3):738-745. doi:10.1067/mob.2000.106766.
22. Spencer C, Neales K. Antenatal corticosteroids to prevent neonatal respiratory distress syndrome. We do not know whether repeated doses are better than a single dose. BMJ. 2000;320(7231):325-326. doi: 10.1136/bmj.320.7231.325
23. Lieman JM, Brumfield CG, Carlo W, et al; Preterm premature rupture of membranes: is there an optimal gestational age for delivery? Obstet Gynecol. 2005 Jan;105(1):12-7.
24. NICE (inherited guideline). Induction of labour. July 2008.
25. Wazed F, Jahan S, Tanira S. Indication of Caesarean Section Operation in Preterm Pregnancy and Its Outcome - A Study of 100 Cases. J Dhaka Med Coll. 2009; 18(2): 124-126.
26. Ara I, Banu H. A Prospective Randomised Trial of Nifedipine Versus Placebo in Preterm Labour. Bangladesh J ObstetGynaecol, 2008; Vol.23(2): 61-64.
27. Mondal BR. A Study on Feto-Maternal Outcomes Following ProlongedPretermPremature Rupture of the Membranes. BCPS 2010.
28. Karim F, Mushtaq M. Term Prelabour Rupture of Membranes: Management and Outcome. Pakistan Armed Forces Medical Journal2006 (3).
29. Villalobos A, Coutiño García ME. Frequency of cesarean section in at- term pregnancies with premature rupture of membranes. Ginecol ObstetMex. 1998 Nov; 66:452-5.
30. Shahid AR, Hosna AU, Tahmina HZ. Hypomagnesaemia in Pregnancy: A Predictor of Preterm Labour. J Dhaka Med Coll. 2010; 19(1): 51-57. 31. Russell KP, Anderson GV.Am J Obstet Gynecol 1962; 831:930.
32. AhuedAhued JR, Guerra Martínez PF, de los Angeles Segura Roldán M, Lowemberg Favela E, Sangines Martínez A. Rupturaprematura de membranas. Análisis de 520 casos [Premature rupture of membranes. Analysis of 520 cases]. GinecolObstet Mex. 1986;54:159-163.
33. American College of Obstetricians and Gynecologist. Premature rupture Clinical management guideline for obstetrician- of membranes. Clinical management gynecologists. ACOG practice bulletin no. 1. Int J Gynecol Obstet 1998; 63:75-84.
34. Begum K. Analysis of 20,119 deliveries in Dhaka Medical College Hospital. Asia Oceania J Obstet Gynaecol. 1993;19(1):1-6. doi:10.1111/j. 1447-0756. 1993. tb00339.x

Bangladesh Med J. 2022 May; 51(2)
DOI: https://doi.org/10.3329/bmj.v51i2.69240

Case Report

Coronary Artery Perforation following Percutaneous Coronary Intervention in an Elderly Patient: A case report

Barua S[1], Hasan MK[2*], Raha SK[3], Rahaman MS[4], Hossain MS[5]

Abstract

Percutaneous coronary intervention (PCI) is widely used in the diagnosis and treatment of symptomatic coronary artery disease. However, much like any other procedure, it has its risks; one such rare but lethal complication is coronary artery perforation (CAP) which requires immediate intervention. Prompt recognition and appropriate treatment strategy are of utmost importance in reducing the mortality and morbidity. We herein report a case of Ellis Type III perforation of the left anterior descending coronary artery (LAD) during PCI who underwent emergency coronary artery bypass grafting (CABG) refractory to conventional coronary stent placement and balloon tamponade. The patient recovered well despite excessive initial postoperative bleeding and was discharged from the hospital.

Keywords: *Coronary artery disease, coronary artery perforation, percutaneous coronary intervention, complication*

INTRODUCTION

Coronary artery perforation (CAP) is an infrequent but potentially life-threatening complication of percutaneous coronary intervention (PCI). The incidence of CAP during PCI has been reported as about 0.2–0.6%.[1,2] The risk factors associated are female sex, old age, complex coronary artery lesions, location of lesion, use of oversized balloons or stents, high-pressure balloon dilatation and hydrophilic-coated, polymer jacketed, and stiff-tip guidewires.[3,4] Ellis has classified coronary artery perforation according to its severity into three types.[3-5] Type I CAP is defined by the development of an extra luminal crater, without extravasation. Type II CAP refers to the development of a pericardial or myocardial blush, without contrast jet extravasation. Type III CAP, the most severe form of it is defined as a perforation resulting in extravasation of blood through a frank perforation (>1 mm) or spilling into an anatomic cavity. It is associated with very high mortality rates, ranging from 7 to 44%. The rate of cardiac tamponade is also high[6] (up to 40%) and emergency coronary artery bypass grafting (CABG) is required in 20–40% of cases.[5]

Treatment should be aimed at sealing the perforation with low pressure prolonged conventional or perfusion balloon inflation, prudent reversal of anticoagulation and use of covered stents. Echocardiography should be performed in all cases of coronary perforation and urgent pericardiocentesis if tamponade develops. In cases where sealing of the perforation by conservative measures cannot be achieved, emergency bypass surgery must be performed Treatment should be aimed at sealing the perforation with low pressure prolonged conventional or perfusion balloon inflation, prudent reversal of anticoagulation and use of covered stents. Echocardiography should be performed in all cases of coronary perforation and urgent pericardiocentesis if tamponade develops. In cases where sealing of the perforation by conservative measures cannot be achieved, emergency bypass surgery must be performed

Treatment should be aimed at sealing the perforation with low pressure prolonged conventional or perfusion balloon inflation, prudent reversal of anticoagulation and use of covered stents. Echocardiography should be performed in all cases of coronary perforation and urgent pericardiocentesis if tamponade develops. In cases where sealing of the perforation by conservative measures cannot be achieved, emergency bypass surgery must be performed

Treatment should be aimed at sealing the perforation with low pressure prolonged conventional or perfusion balloon inflation, prudent reversal of anticoagulation and use of covered stents. Echocardiography should be performed in all cases of coronary perforation and urgent pericardiocentesis if tamponade develops. In cases where

1. Dr. Sumit Barua, Medical Officer, Department of Cardiac Surgery, Bangabandhu Sheikh Mujib Medical University (BSMMU).
2. *Dr. Md. Kamrul Hasan, Professor, Department of Cardiac surgery, National Institute of Cardio-vascular Diseases (NICVD), Dhaka. E-mail: profkamrulcts@gmail.com
3. Dr. Sanjay Kumar Raha, Associate Professor, Department of Cardiac surgery, NICVD, Dhaka.
4. Dr. Md. Salahuddin Rahaman, Assistant Registrar, Department of Cardiac surgery, NICVD, Dhaka.
5. Dr. Md. Sorower Hossain, Assistant Registrar, Department of Cardiac surgery, NICVD, Dhaka.

* For correspondence

sealing of the perforation by conservative measures cannot be achieved, emergency bypass surgery must be performed

Current mainstay of treatment for severe perforation (type III Ellis) is immediate hemodynamic stabilization, sealing by prolonged balloon inflation, if available, use of perfusion balloons followed by covered stent implantation.[7, 8] Urgent pericardiocentesis should be performed if tamponade develops. However, when these measures fail, emergent surgical intervention may be required.[8,9,10] We report such a case of successful management of a Type III left anterior descending (LAD) CAP by emergency CABG.

CASE REPORT

A 63-year-old male with a history of hypertension and type II diabetes mellitus was admitted to the Coronary Care Unit for chest pain and dyspnea for one day. Electrocardiogram and chest x-ray were normal. The initial serum troponin I level was 22.041ng/ml and he had a rare blood group (O negative). Electrocardiography showed inferior wall hypokinemia and mild LV systolic dysfunction with an ejection fraction of 50%. He was given medical therapy with low molecular weight heparin, aspirin 75mg and atorvastatin 80mg and was elected to undergo percutaneous coronary intervention (PCI).

Coronary angiography (Figure 1) revealed 70% long lesion at junction of proximal and mid left anterior descending (LAD) coronary artery and 80% lesion in dominant, distal circumflex coronary artery (LCx).

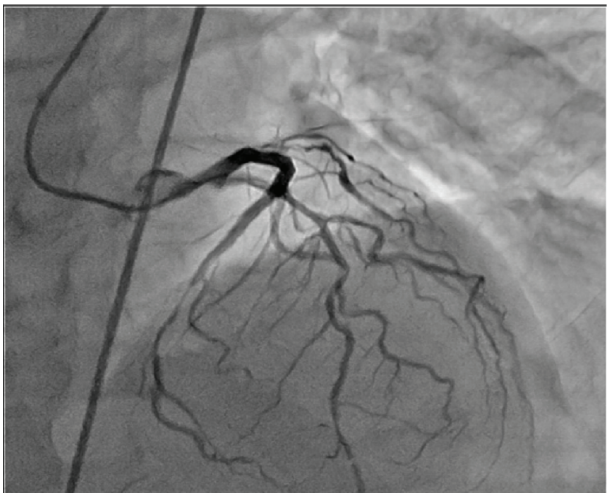


Figure- 1: *Coronary angiography showing 70% long lesion at junction of proximal and mid left anterior descending (LAD) coronary artery and 80% lesion in dominant, distal circumflex coronary artery (LCx).*

Right femoral 6 French (6F) arterial access was taken and the vessel was cannulated with 6 French catheter with 3.5cm curve. The lesion in LCx was wired with 0.014-inch Balance Middleweight (BMW) coronary wire. The lesion was then pre dilated and 2.25×28mm Promus Premier Stent was successfully deployed over the stenosed area (Figure 2). 2.5×10mm Europa was used for post dilatation.

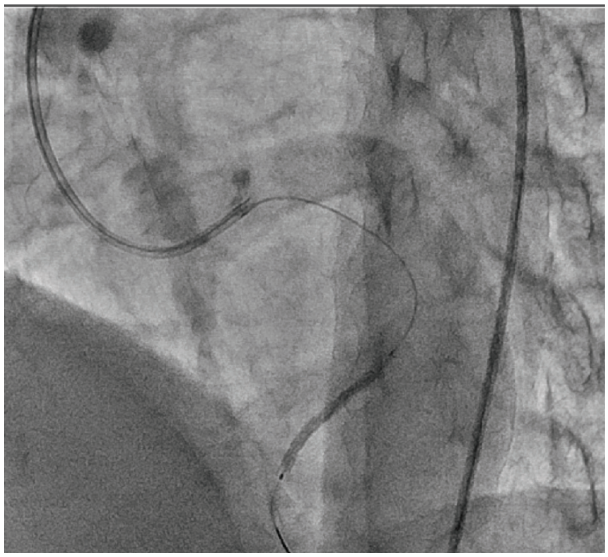


Figure- 1: *Coronary angiography showing 70% long lesion at junction of proximal and mid left anterior descending (LAD) coronary artery and 80% lesion in dominant, distal circumflex coronary artery (LCx).*

In case of LAD a0.014-inch Rinato guidewire was used to pass through the lesion. Pre-dilatation was done with 1.5×15mm Europa balloon. The control angiography after pre-dilatation (Figure 3) showed a type III Ellis severe perforation.

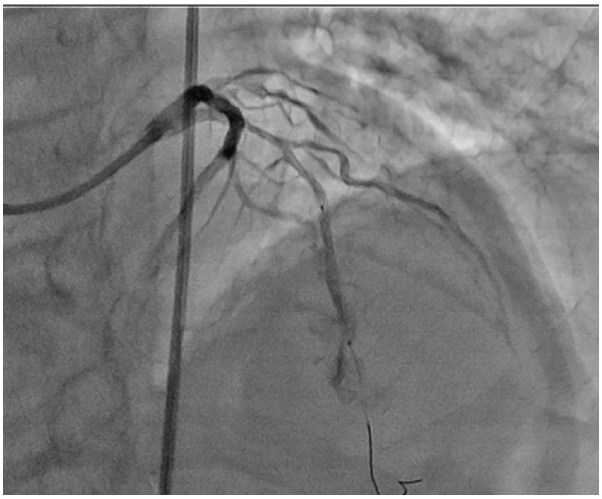


Figure- 3: Ellis Type III perforation after pre-dilatation.

A 2.5×27mm NC Euphora balloon was immediately introduced to the site of perforation and balloon occlusion was done for 20minutes in an attempt to seal the perforation. However, the perforation continued to persist. Hence, two covered stents sized 2.8×19mm and 3.5×26mm Graft master was implanted to cover the rupture area. Despite all these attempts, the angiography (Figure 4) showed continued contrast extravasation. Echocardiography revealed mild pericardial effusion with no evidence of cardiac tamponade. He was tachycardia, anaemic and other parameters were normal. Protamine sulphate to reverse heparin was not considered in view of the risk associated with stent thrombosis and also because the patient had mild derangement in the hemodynamics.

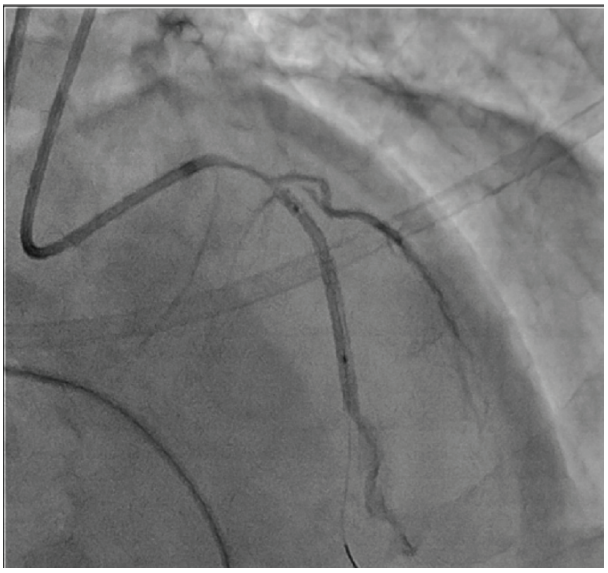


Figure- 4: *Contrast extravasation after implantation of covered stents*

The patient underwent open heart surgery with prolonged balloon inflation proximal to the ruptured area to prevent further blood extravasation and subsequent cardiac tamponade. During surgery 750ml of clotted blood was evacuated from the pericardial cavity. A hematoma was found in the LAD territory (Figure 5) at the site of stent insertion and there was no active bleeding found. Cardiopulmonary bypass (CPB) was established and left internal mammary artery (LIMA) was harvested and grafted to LAD distal to the stent (Figure 6). The patient was weaned from CPB uneventfully and shifted to intensive care unit (ICU). Cross clamp time was 28 minutes and total CPB time was 54 minutes.

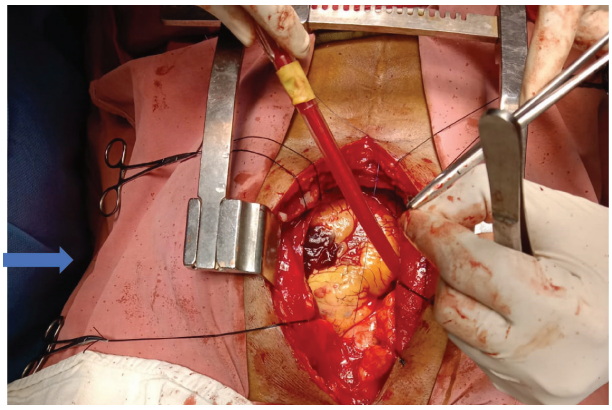
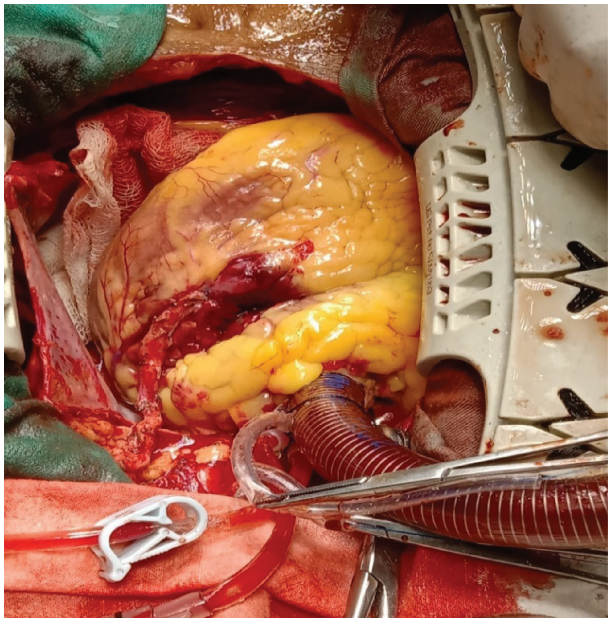


Figure- 5: *Hematoma found in the LAD territory at the site of stent insertion*



i**Figure 6.** *LIMA harvested and grafted to LAD distal to the stent*

The patient was extubated after 16 hours. He received 7 units of whole blood, 3 units of fresh frozen plasma in the perioperative period. Tranexamic acid was given to reduce postoperative bleeding. Chest drain collection was 800 ml in the first 24 hours but resolved gradually and completely by post-operative day 6. Troponin levels were not tracked in the post-procedural period. An echocardiogram performed on 6th postoperative day showed normal chamber dimensions, hypokinetic anterior and septal wall of LV, moderate LV systolic dysfunction (Ejection fraction- 40 to 45%), no pericardial effusion and good RV systolic function (TAPSE 17mm). The patient was discharged on the 8th postoperative day in a stable state and continues to be on a regular follow up.

DISCUSSION

The prevalence of emergency CABG has declined significantly in the recent times.[9, 10] This decline is due to increased operator skill and experience, better percutaneous techniques and advances in stent technology which has helped interventional cardiologists to bail out most of the complications caused by failed PCI. However, when surgical intervention is required after failed angioplasty it is associated with high morbidity and mortality.[13-15]

Current recommendation for management of CAP consists of prolonged balloon inflation (proximal to or at the site of perforation to prevent tamponade) and reversal of anticoagulation with protamine[10]. It has been reported that in patients with coronary artery perforation administration of protamine seems to be safe, without an increase in the risk of vessel or stent thrombosis.[11]

Surgical management includes either ligation or suturing of the vessel and bypass grafting to the distal portion of the vessel. Furthermore, pericardial patch/Teflon felt wrapping repair of the CAP with or without coronary bypass grafting is an alternative technique especially when multiple stents with CAP and sub-epicardial hematoma are present.[16]

The Type III perforation in our case had occurred due to high-pressure balloon dilatation or probably due to the fragile vessel wall. As the perforation had been automatically sealed and hematoma was non-expanding, ligation of LAD was not done. In addition, proximal ligation of LAD could result in a long-occluded segment thereby limiting blood flow to the septal branches and could result in a serious myocardial infarction. Hence, LIMA was harvested and grafted to LAD distal to the sealed hematoma to ensure flow in the LAD territory.

Unlike elective CABG, emergency CABG has increased risk of postoperative complications and higher mortality. This is mainly due to the limited preoperative patient evaluation and optimization prior to surgery. As heparin reversal was not performed during PCI in our patient, massive blood loss was anticipated. In addition to the arrangement of large units of rare O negative blood to maintain the patient hemodynamics, arrangement of OT personnel during the fasting period of Holy month of Ramadan especially during the iftar period was a challenging task. Patient counseling regarding operative complications and patient outcome was also important. Despite all these challenges, surgery was successfully performed on this patient.

CONCLUSIONS

In cases of CAP, timely management plays a crucial part in the patient outcome. Caution must be taken during advancement of guide wires and during dilatation of the coronary lesion either before stent, during, or after stent implantation to avoid this serious and potentially lethal complication. Immediate sealing of the ruptured coronary vessel by employing stent-grafts in addition to reversal of anticoagulation can defer a potentially lethal complication. However, if balloon occlusion or stents fail to seal the perforation or patient becomes hemodynamically unstable, emergency CABG must be done.

Conflicts of interest

The authors declare no conflicts of interest regarding the publication of this paper.

REFERENCES

1. Shimony A, Joseph L, MottilloS, Eisenberg MJ.Coronary artery perforation during percutaneous coronary intervention: a systematic review and meta-analysis. Can J Cardiol.2011; 27: 843-850.
2. Gruberg L, Pinnow E, Flood R, Bonnet Y, Tebeica M, Waksman R, et al. Incidence, management, and outcome of coronary artery perforation during percutaneous coronary intervention. Am J Cardiol. 2000;86(6):680-2.
3. Lemmert ME, van Bommel RJ, Diletti R, Wilschut JM, de Jaegere PP, Zijlstra F, et al. Clinical Characteristics and Management of Coronary Artery Perforations: A Single-Center 11-Year Experience and Practical Overview. J Am Heart Assoc. 2017; 6(9)
4. Hendry C, Fraser D, Eichhofer J, Mamas MA, Fath-Ordoubadi F, El-Omar M, Williams P. Coronary perforation in the drug-eluting stent era: incidence, risk factors, management and outcome: the UK experience. EuroIntervention. 2012 ;8(1):79-86
5. Ellis SG, Ajluni S, Arnold AZ, Popma JJ, Bittl JA, Eigler NL, et al. Increased coronary perforation in the new device era. Incidence, classification, management, and outcome. Circulation. 1994;90(6):2725-30.
6. Patel VG, Brayton KM, Tamayo A, Mogabgab O, Michael TT, Lo N, et al. Angiographic success and procedural complications in patients undergoing percutaneous coronary chronic total occlusion interventions: a weighted meta-analysis of 18,061

patients from 65 studies. JACC Cardiovasc Interv. 2013;6(2):128-36.

7. Ben-Gal Y, Weisz G, Collins MB, Genereux P, Dangas GD, Teirstein PS, et al. Dual catheter technique for the treatment of severe coronary artery perforations. Catheter Cardiovasc Interv. 2010;75(5):708-12.
8. Lansky AJ, Yang YM, Khan Y, Costa RA, Pietras C, Tsuchiya Y, et al. Treatment of coronary artery perforations complicating percutaneous coronary intervention with a polytetrafluoroethylene-covered stent graft. Am J Cardiol. 2006;98(3):370-4.
9. Seshadri N, Whitlow PL, Acharya N, Houghtaling P, Blackstone EH, Ellis SG. Emergency coronary artery bypass surgery in the contemporary percutaneous coronary intervention era. Circulation. 2002;106 (18):2346-50.
10. Yang EH, Gumina RJ, Lennon RJ, Holmes DR Jr, Rihal CS, Singh M. Emergency coronary artery bypass surgery for percutaneous coronary interventions: changes in the incidence, clinical characteristics, and indications from 1979 to 2003. J Am Coll Cardiol. 2005;46(11):2004-9.
11. Krabatsch T, Becher D, Schweiger M, Hetzer R. Severe left atrium compression after percutaneous coronary intervention with perforation of a circumflex branch of the left coronary artery. Interact Cardiovasc Thorac Surg. 2010;11(6):811-3.
12. Witzke CF, Martin-Herrero F, Clarke SC, Pomerantzev E, Palacios IF. The changing pattern of coronary perforation during percutaneous coronary intervention in the new device era. J Invasive Cardiol. 2004;16(6):257-301.
15. Cowley MJ, Dorros G, Kelsey SF,Van Raden M, Detre KM. Emergency coronary bypass surgery after coronary angioplasty: the National Heart, Lung, and Blood Institute's Percutaneous Transluminal Coronary Angioplasty Registry experience. Am J Cardiol. 1984 ;53(12):22C-26C
14. Parsonnet V, Fisch D, Gielchinsky I, Hochberg M, Hussain SM, Karanam R, Rothfeld L, et al. Emergency operation after failed angioplasty. J Thorac Cardiovasc Surg. 1988;96(2):198-203. Erratum in: J Thorac Cardiovasc Surg 1989;97(4):503.
15. Craver JM, Weintraub WS, Jones EL, Guyton RA, Hatcher CR Jr. Emergency coronary artery bypass surgery for failed percutaneous coronary angioplasty. A 10-year experience. Ann Surg. 1992;215(5):425-33; discussion 433-4.
16. Inoue Y, Ueda T, Taguchi S, Kashima I, Koizumi K, Noma S. Teflon felt wrapping repair for coronary perforation after failed angioplasty. Ann Thorac Surg. 2006;82(6):2312-4.

Obituary news May-2022

BMA would like to express deep condolence on deaths of the following notable physicians in recent past:

Sl. No.	Name	Date of Death
1	Professor Dr. Mamun Ur Rashid	21/10/2021
2	Dr. Jahedul Islam	28/01/2022
3	Professor Dr. Abdul Hay Fakir	07/02/2022
4	Dr. Samsuddin Mondal	09/02/2022
5	Dr. Samina Akter	17/02/2022
6	Dr. Md. Ahsanul Haque Talukder Pavel	23/02/2022
7	Dr. Chitta Ranjan Bishwas	25/02/2022
8	Professor Dr. Ataul Haque Tipu	28/02/2022
9	Dr. Saidur Rahman	02/03/2022
10	Professor Dr. Al-Mamun Ferdousi	03/03/2022
11	Professor Dr. Abdul Matin Khan	06/03/2022
12	Dr. Md. Atiq Ullah	17/03/2022
13	Dr. Ahmed Mahi Bulbul	24/03/2022
14	Professor Dr. K.A. Jalil	02/04/2022
15	Dr. Waliul Islam (Juglu)	04/04/2022
16	Dr. Ashiqur Rahman	05/04/2022
17	Dr. Sirajul Islam	19/04/2022
18	Dr. Basudev Saha	14/05/2022
19	Professor Dr. Khurshida Jahan Mawla	15/05/2022
20	Dr. Feroz Miaji	29/05/2022

May Allah bless the departed souls.
Our heartiest commiseration to the deceased's family, our prayers are with them during this difficult moment of their life.

Call for paper

To reach the doctors throughout the country and ensure their participation as author, contents and presentation of the Bangladesh Medical Journal have been updated & changed to some extent. In addition to original articles, review articles and case reports; we are going to publish following sections regularly.

Letters to the editor
With a view to increase the bondage with the readers, we encourage to write letters to the editor. Letters may include original research presented in a research letter format or case reports or series. Alternatively, readers may express their ideas, opinions on important national or international issues related to doctors, medical science or medical profession.

On being a doctor
Doctors are encouraged and advised to share their sweet, bitter, sad, memorable & illuminating experiences as a professional doctor in the hospital and private chamber.

Medical news
Important recent updated inventions and ideas that may change the knowledge, attitude & practice of a doctor and courses of the medical sciences, both at home and abroad; may be written to us for publication in Bangladesh Medical Journal.

Medical jokes/poems
Meaningful jokes or poem writing related to medical profession and submitting to us by soft copies are encouraged. There is no deadline of submission.

Please send your writings to the e-mail address of Bangladesh Medical Association Journal
E-mail: journal@bma.org.bd, drzimmunipsom@gmail.com

Published by: Dr. Md. Ehteshamul Huq Choudhury on behalf of the Bangladesh Medical Association, BMA Bhaban, 15/2, Topkhana Road, Dhaka-1000, Bangladesh. Phone: +88-02-223388714, +88-02-223382527, Fax: +88-02-9566060, E-mail: journal@bma.org.bd, website: www.bma.org.bd Subscription: Local-Tk. 15 for single and Tk. 60 for annual. Overseas-$5 for single and $20 for annual.Printed by: Asian Colour Printing, 130, D.I.T. Extension Road, Fakirerpool, Dhaka-1000, Bangladesh. Tel: 49357726, 58313186, E-mail: asianclr@gmail.com. web: www.acp1980.com