Contents

Chattagram International Medical College Journal

Editorial Board

INFORMATION TO AUTHORS

Focus

Chattagram International Medical College (CIMC) established on 2013 is one of the famous and reputed Medical College among the Private Medical Colleges in Bangladesh as reflected by the performances of students in examinations of Chittagong University. A very good number of academicians and researchers are performing in this institute.

Chattagram International Medical College commenced to publish a peer reviewed scientific Journal from 1st January 2016 which is recognized by BMDC and having International Standard Serial Number (ISSN) 2520-484X. The journal publishes article of authors from any part of the globe, but has a special interest in publishing research articles of authors from Bangladesh and of relevance to developing countries. It publishes Editorial, Original (Research) articles, Special articles, Review articles, Short Communications, Case report and letters on new findings of Medical Science.

Chattagram International Medical College journal is published in english, biannually eg. January and July with prior approval of Editorial board.

Appropriate measures has been taken to make the journal indexed / abstracted in major international indexing systems including the PubMed/MEDLINE, Index Medicus, Google Scholar, DOAJ, Hinari and Scopus etc. The theme of Chattagram International Medical College Journal is

"Excellence Through Peer Review"

Submission of Manuscript

Manuscript (Papers) are submitted to the Editor-In-Chief or authorised persons at any time. Papers accepted for publication are subjected to peer review and editorial revision. With full title (Title should be concise and informative) two copies of papers (Along with CD) accompanied by a covering letter signed by Principal and Co-authors including name, academic degrees, designation, the departmental and institutional affiliation. Complete address, Cell number including Email address of Corresponding author should be mentioned. Not more than 7 (Seven) authors will be accepted for all manuscripts.

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A structured abstract should not be of more than 250 words. It should be a factual description of the study performed organized with the heading of Background (Includes aim or objectives) Methods (Includes patient population, procedures and data analysis) Result and Conclusion. The abstract should contain the data to support the key findings or conclusions of the study and this should be self explanatory without references to the text. the first time an abbreviated term is used it should be spelled out in full form and follow with the abbreviation in parentheses for example :- BPH (Benign Prostatic Hyperplasia). Please do not cite any references in the abstract.

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Original Article : A research, observational and experimental article should be devided into the following sections with headings :

- Introduction
- Materials and methods
- Result
- Discussion
- Conclusion
- Recommendation (If any)
- Acknowledgements (If any)
- Limitation (If any)
- Disclosure

Single digit numbers used in the text should be in words except datas and reference numbers. Maximum length of text may be with in 6000-6500 words (Excluding abstract, table, figure and references). The total number of reference should not be less than 15 (Fifteen) for the original article.

Special Article / Short Communication

Its a medical based text of any disciplines. Maximum length of the Special article / Short Communication may be with in 2500-3000 words (Excluding abstract, table, figure and references). The total number of reference should not be less than 10 (Ten).

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Review Article

Its a prestigious article, which is divided into the following sections with headings

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- Search Strategy
- Discussion
- Conclusion
- Disclosure

Review article should not generally exceed 8500 words, including illustrations and the number of references should not be more than 30 (Thirty).

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Text of Case report with the following section

- Introduction
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- Discussion
- Figure / Legends (If any)
- Conclusion
- Disclosure

Maximum length of the text may be with in 2000-2500 words (Excluding abstract and references). The total number of reference should not be less than 10 (Ten).

Letter

Letter should be brief and to the point with in 500-600 words only.

It is noted that standard abbreviations should be used whenever. The full form for which the abbreviations stands followed by the abbreviation in parenthesis should preceede the use of the abbreviation in the text except for standard ones like $45^{o}c$, 35mg/L etc in all types of text.

References

Regarding references please follow the Vancouver style (Uniform requirements for manuscripts submitted to biomedical journals prepared by the International Committee of Medical Journal Editors (ICMJE guideline http://www.icmje.org).

Reference citations in the text should be numbered in arabic numerals at the end of the sentence eg [1,2] consecutively in order in which they are mentioned in the text.

Book references should have the name of the authors, chapter title, editors, Book name, the edition, place of publication, the publisher, the year and the relevant pages.

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The first six authors of a work should be named, followed by 'et al' if there are more than six. If less than six authors the name of the all authors may be mentioned.

Examples

Book reference : Meltzer PS, Kallioniemi A, Trent JM. Chromosome alterations in human solid tumors. In : Vogelstein B, Kinzler KW, editors. The genetic basis of human cancer. New York, USA : McGraw Hill. 2002; 6:93-113.

Journal reference : Halpern SD, Ubel PA, Caplan AL. Solid organ transplantation in HIV infected patients. N EngL J Med. 2012; 34(4) : 284-287.

Citation from a website : Cancer - Pain.org [Internet]. New York : Association of Cancer Online Resource, Inc, c 2000 - 2001 Available from : http : //www.cancer-pain.org/.

Table

- All tables should be numbered using Roman numerals (I, II).
- Table should always be cited in text in consecutively using Roman numericals (eg Table I, II).
- Mentioned the caption at the top of table. Table should be planned as brief as possible.
- Significance values and other statistical data should be included beneath the table.

Figures / Graphs

- All Figures / Graphs are to be numbered using Arabic numerals (1, 2).
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- Provide a caption at the bottom for each figures / graphs.
- Reduce figures / graphs to fit either in one column or within the two column width of the journal page.

According to guidelines of the Internation committee of Medical Journal Editors (http:// www.icmje.org) please provide only 4/5 table with Roman numerical I, II with caption at the top of the table and only 4/5 figures / graphs with Arabic numerical 1, 2, with caption at the bottom of the figures / graphs.

Images / Photographys / Legends

Unmounted glossy print, B-2 size with good contrast (600 pixels). 3 Images / Photographys / Legends are allowed for whole text.

Declaration

The article should accompany a declaration signed by author and co-authors which includes a statement that neither the article nor any part of its essential subtance table or figures is published in any journal nor submitted elsewhere for consideration of publication before appearing in this journal. The declaration form must be collected from the office of Editor-In-Chief

Competing Interests

Chattagram International Medical College Journal requires authors to declare any competing financial or other interest in relation to their work. Where an author gives no competing interests, the listing will read the author (s) declare that they have no competing interests.

In Quest of Safe Doctors for a Better Tomorrow

Wazir Ahmed[1*]

Medical education has over the year's undergone great transformation with the advent of modern day technology in regards to information and dissemination of knowledge. A medical student has to undergo an intense involvement of Pre clinical, Para clinical and Clinical courses after qualifying High School Examination. This change of scenario from limited pre medical studies to serious medical curriculum studies is very demanding and needs lot of patience and endurance which leads to a make or break situation. It is therefore imperative that children should have career counseling before they take any under graduate studies. Parents and school teachers have a role to play and understand the mindset of the students and give them the freedom to choose their career without any pressure. After enrolment into medical college a medical student goes through a five long years of continuous search and research of the function of the human body and its disease process. In their pursuit to know the unknown functions of human body, disease process and remedy of human disease, a long journey starts. In this regard the student is aided by the following teaching methodology, text books, lectures, practical teaching, ward rounds, bed side teaching etc. In order to keep pace with this learning process a student has to be seriously focused with a strong bent of mind, without any room for complacency. Learning and teaching is a feedback mechanism which depends on good teacher student rapport and understanding. A teacher has to understand the weakness and strength of their students with direct one to one contact and work on their performance. Any student lacking behind in their performance, should have a room for soul searching with remedy. In this case parent's involvement is also imperative. Modern day's education has improved leaps and bounds with the advent of state of the art technology. Gone are the days of black board, chalk and duster. It is an age of ICT where information is within the grasp of the tip of the finger. Internet, Google and other search engines are a boon to help improve one's knowledge in any field. Tele medicine and other on - line learning facilities have become a part and parcel of medical education and management of patients. Learning process of any medical graduate has no end to it, this is an infinite journey in search of empowering oneself with the latest development in the field of medical science and in this regard CME (Continuing Medical Education) has also a great role to play. Active participation in medical conferences also gives a wide range of opportunities to help learn and interact with fellow colleagues to boost ones knowledge and disseminate to others for better patient care and management. Finally we all need to think out of the box and come out of our comfort zone because we are dealing with humans and human life matters. Time and tide waits for none, full use of today is the best preparation for tomorrow. I would therefore urge the students to look beyond today for a better tomorrow. Motivation is what gets them started; habit is what keeps them going. To acquire knowledge one must study, but to acquire wisdom, one must observe. Politeness and consideration for others is like in vesting pennies and getting dollar back.

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Study on Contributing Factors of Unsafe Abortion in A Rural Community

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Abstract

Background: Unsafe abortion is one of the important causes of maternal morbidity and mortality globally. Globally more than half of the unintended pregnancies end in induced abortion. Approximately half of the admissions to gynaecology units in major hospitals of Bangladesh are for complications of abortion. This study aimed to assess the contributing factors of unsafe abortion.

Materials and methods: It was a prospective cross sectional study carried out in the department of Obstetrics & Gynaecology, Jahurul Islam Medical College Hospital, Kishoregonj from October 2013 to March 2014. Total 50 patients of unsafe abortion were included in this study. After collecting all the data of different test results analyses were done by SPSS vertion 15.0.

Results: This study showed 32% of the patients were in the age group of 26-30 years. Majority (46%) of the patients were from middle class family. 78% were housewives while 6% respondents were unmarried. It was found that 52% were user of contraception.24% of women chose to have the abortion done due to multiparity. That mean they did not want large family.

Conclusion: This study suggests that consistent and correct use of modern methods of contraception can prevent many unwanted pregnancies and thus reduce unsafe abortion.

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Introduction

Unsafe abortion is defined as a procedure for terminating an unwanted pregnancy, either by persons lacking the necessary skills, or in an environment lacking the minimal medical standards or both (WHO)[1]. Due to lack of awareness, contraceptive failure and husband unwilling to use contraceptives or due to rape, women become pregnant unwillingly. Social status of our women is very low. So, she cannot establish her reproductive rights and ultimately become bound to go for induced abortion. It is one of the most neglected problems of health care in developing countries[2]. This study is therefore aimed at determining the contributing factors of unsafe abortion cases in rural community.

Materials and Methods

It was a prospective cross sectional study conducted in the department of Obstetrics and Gynaecology of Jahurul Islam Medical College Hospital, Kishoregonj, Bangladesh, from October 2013 to March 2014.Total 50 patients attending in the Department of Obstetrics and Gynaecology (both inpatient and outpatient), JIMCH, having history of termination of unwanted pregnancy by unskilled personnel and/or carried out at unregistered private clinics or at home at a gestational age less than or equal to 22 weeks.

Results

This study was undertaken with the objective to assess the contributing factors of unsafe abortion in rural community. A total of 50 unsafe abortion cases were included in this study.

Table I Distribution of the cases by their age (n=50)

Age in years	Frequency	Percentage (%)
<20	8	16
21-25	8	16
26-30	16	32
31-35	13	26
>35	5	10
T0TAL	50	100

In table I five age groups were plotted. Most of the patients belong to '26-30 years' age group {16 (32%)}.

Martial status

6% un married
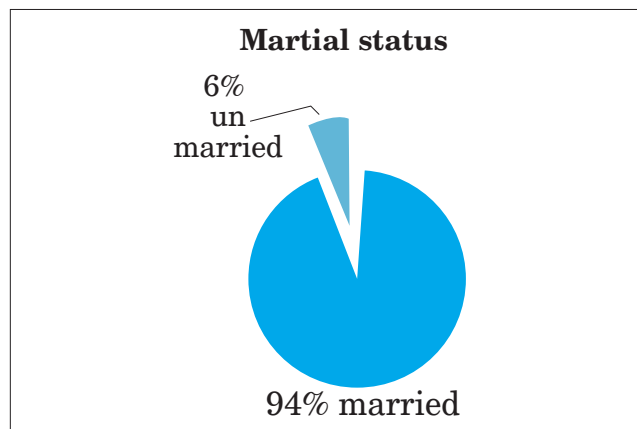
94% married

Figure 1 Distribution of the patients by their marital status (n=50)

Figure 1 illustrates that most of the patients were married 47(94%) and 3 (6%) respondents were unmarried.

Socioeconomic status

12% high

0

44% low
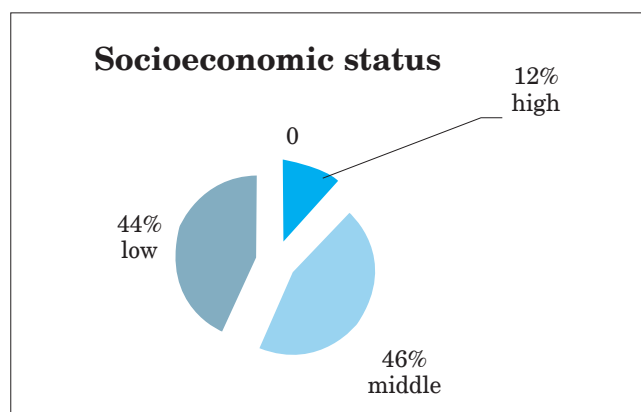
46% middle

Figure 2 Distribution of the patients according to their socioeconomic status (n=50)

Figure 2 shows that most of the cases {23 (46%)} came from middle class family, 22(44%) cases belongs to low socioeconomic condition and only 6(12%) belongs to high.

Knowledge of contraception

0

12% good

50% poor
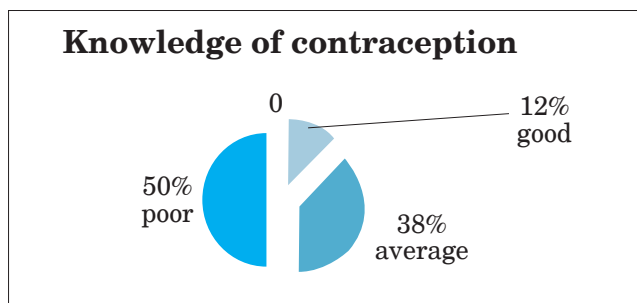
38% average

Figure 3 Distribution of the patients by their knowledge of contraception (n=50)

Figure 3 shows maximum {25(50%)} respondents had poor knowledge about different methods of contraception. 19(38%) were average knowledge and 6(12%) had good knowledge about different methods of contraception.

Status of contraceptive use

12% Group 3

26% Group 2

26% Group 1

■ user (Gr 1)

■ nonuser (Gr 2)

■ previously used (Gr 3)
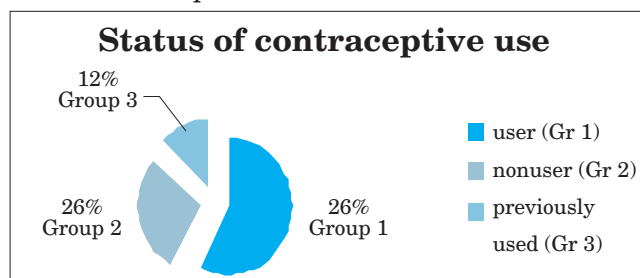
Figure 4 Distribution of the patients according to their status of contraceptive use (n=50

Figure 4 shows that most of the cases {26(52%)} were contraceptive user, 13(26%) were non user and 6(12%) were previously user.

Table II Distribution of patients by theirs reasons of unsafe abortion (n=50)

Reason	Frequency	Percentage (%)
Health problem	9	18
Close to previous pregnancy	10	20
Multipara	12	24
Teenage pregnancy	4	8
Poverty	7	14
Illegal pregnancy	3	6
Other (Doesn't want baby now, social embarrassment, elderly mother)	5	10

Table II shows that, while enquired about the reasoning for unsafe abortion, the respondents gave way various synonymous words, among them 'to keep the family small' counted most {24%(12)}.

Knowledge about complication

12% yes

88% no
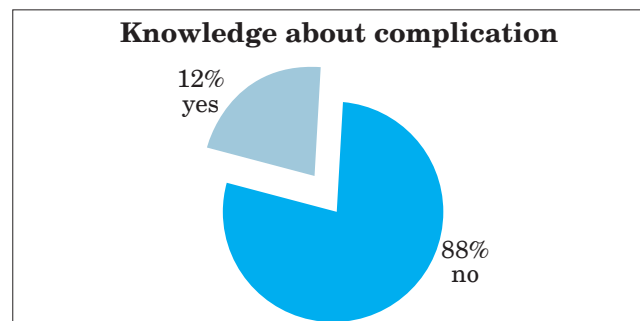
Figure 5 Distribution of the patients by their knowledge about complications (n=50)

Figure 5 shows only 12%(6) have knowledge about contraception.

Discussion

A total number of 50 unsafe abortion were included in this study. In this study shows 32% of the patients were in the age group of 26-30 years. These findings consisted with Fawad et al study[3-5].

Out of 50 patients most of them were married (94%) and only 6% respondents were unmarried. Another study found that all the women, except two, were married[6-8]. Among 50 patients 46% were from middle class family, 44% being in low socio economy and only 12% from higher. Theparticipants majority (52%) patients practice of contraception use and 26% had no practice of contraception use. 12% were previously user. While in Akhter et al almost four fifth of the women were not using any contraceptive at the time of conception[9-10]. While enquired about the reasoning for abortion induction, the respondents gave away various anonymous words; among them multiparity counted most (24%). 20% said that the abortion was done as it was close to previous pregnancy. 18% due to health problem, 14% due to poverty, 8% due to teenage pregnancy and 6% said illegal pregnancy as a cause of their induced abortion. 10% women gave other reasons like doesn't want baby now, social embarrassment, elderly mother.

Conclusion

Unsafe abortion is a common and serious gynaecological problem in Bangladesh. Easy availability of contraceptive methods & proper knowledge of consistent & correct use of these methods can prevent many unwanted pregnancy, thus unsafe abortion and its consequences also reduce.

Disclosure

All the authors declare no competing interest.

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Stresses and Consequences among Physicians of Bangladesh during COVID-19 Pandemic: An Assessment of Experience and Perception

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Abstract

Background: Health providers working in non-COVID hospitals in Bangladesh may be at an increased risk of infection with the new coronavirus, Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) compared to health providers working in COVID-dedicated hospitals due to lower health security measures. Consequently, health practitioners working at such hospitals may be the most vulnerable health group to stress-related problems and mental illness. To our knowledge, there is no study assessing stress-related problems in this particular population and how this group compares to those working in COVID-dedicated units in terms of pandemic-related stress.

Materials and methods: An online survey was carried out among 247 medical doctors from Bangladesh (101 females and 146 males). We report descriptive statistics and several group comparisons.

Results: The overall stress level among participants was moderated. There were no statistically significant differences in pandemic-related stress between those working in COVID units and those working in regular units. Most participants knew both co-workers and people close to them who had tested positive for SARS-CoV-2. Half of the participants knew someone close to them who had died from COVID-19and 24.7% had got infected themselves.

Conclusions: Medical doctors working in Bangladesh experience significant pandemic-related stress regardless of whether they work in COVID-dedicated units or regular units. Our data highlights the importance of detecting stress in health professionals and developing strategies that aim atreducing the same.

Key words: COVID-19; Doctors; Experience; Mental health; Perception; Stress.

Introduction

The pandemic of Coronavirus Disease 2019 (COVID-19) has put many national healthcare systems to intensive pressure, compromising the well-being of healthcare providers. Medical doctors and other health professionals working in non-COVID hospitals in Bangladesh may be at an increased risk of infection with the new coronavirus, Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2), compared to health providers working in COVID-dedicated hospitals due to lower health security measures. Consequently, health practitioners working at such hospitals may be the most vulnerable health group to stress-related problems and mental illness.

While the most obvious effects of COVID-19 on individuals are physical, the mental health of both infected and non-infected appears to be on the decline since the start of the pandemic. For instance, fear of COVID-19 in the general population has been associated with several mental problems, including, anxiety, depression, phobia, and insomnia[1-3]. Health providers perceive a great risk-to-self due to exposure to patients who may be infected, which adds further stress[4]. Additional issues, such as the shortage of personal protective equipment can further increase work-related stress[5].

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Date of Submission : 26.11.2021
Date of Acceptance : 22.12.2021

Research from previous epidemics and pandemics, such as the SARS outbreak in 2003, the MERS epidemic in 2012, and the Ebola outbreak in Africa shows that health professionals often experience several types of psychological morbidities, including trauma, which correlates with suicide[6,7]. The negative effects of stress on mental health appears to be irrespective of whether the health providers work directly with infected patients[8].

Arecent study showed that frontline doctors in Bangladesh show significant psychological symptoms as a result of the pandemic[9]. More specifically, the study found 36.5% of the doctors had anxiety, 38.4% had depression, 18.6% had insomnia and 31.9% has significant fears concerning COVID-19. A multinomial logistic regression in the same study found that inadequate resources in the workplace where the most significant predictors for all psychological outcomes.

These data highlight the importance of detecting stress in health professionals and developing strategies that aim at reducing the same. Evidence suggests health practitioners are especially vulnerable to mental illness during pandemics and COVID-19 is no different[1-3]. A study conducted in Bangladesh confirms previous findings conducted in other countries during the COVID-19 pandemic, however, the reviewed study was conducted on a sample of frontline doctors[9]. To our knowledge, there is no study assessing stress-related problems in health practitioners working in non-COVID hospitals. The present study aims at addressing this issue by assessing COVID-related stress symptoms in both health practitioners working in non-COVID hospitals and those working in COVID-dedicated unit and comparing these two groups in terms of pandemic-related stress.

Materials and methods

An online survey was carriedamong 247medical doctors (101 females and 146 males)working at different clinical settings in Bangladesh through the Google Forms during the period from March to July 2021. The link was circulated through e-mail, SMS and WhatsApp. Dataset was analyzed through descriptive statistics and group mean comparisons.

The questionnaire consisted of 35 questions and the participants were informed about the objects of the study before taking the survey. The questionnaire consisted of three types of questions: demographic questions, COVID-events questions, and pandemic-related stress questions. Demographic-questions were used to collect dataon age, gender, and workplace (Location and type of hospital-COVID or non-COVID). COVID-events questions collected data on coronavirus infection events at the professional, family, and individual level. The pandemic-related stress questions consisted of 24 five-points Likert scale questions that were used to collect data on physical symptoms, mental symptoms, work-related stressors, social-related stressors, and professional/academic-related stressors.

The answer to each Likert scale question received a score from 1 to 5, where 1 corresponds to selecting the first option ("not at all") 2 corresponds to selecting the second option ("mildly") 3 corresponded to selecting the third option ("moderately") 4 corresponded to selecting the fourth answer ("highly") and 5 corresponded to selecting the fifth option ("extremely"). A lower score indicates a lower level of COVID-19-related stress and a higher score indicates the presence of a higher level of stressors and their consequence resulting from the pandemic. The data were analyzed with SPSS v. 26[10].

Participants provided their consent before taking the survey and their identity remained anonymous. Participants completed the survey two times and were allowed to terminate at any time their desired. The study was approved by the South Point Hospital, Chattogram, Bangladesh (No. Admn/ SPH/ 203/2020).

Results

An analysis of the internal consistency of the Likert scale questionnaire showed a Cronbach's alpha, of .890 which indicates a very high level of internal consistency for this scale with this specific sample.

Cronbach's Alpha	No of Items
.890	24

Of the total number of participants, 101(40.9%) were females and 146 (59.1%) were males. The average age of the participants was 41.7. Of the persons who took the questionnaire, 72 (29.1%) participants worked in COVID-dedicated units and 175 (70.09%) worked non-COVID units. Table I provides some statistics about the participants' occupation.

Table I Participants' workplace

		Frequency	Percent (%)
Valid	Autonomous hospital	22	8.9
	Corporate Hospital	19	7.7
	Government hospital	28	11.3
	Government Medical College	82	33.2
	Medical University	7	2.8
	Private clinic	8	3.2
	Private Medical College	48	19.5
	Private practice	21	8.5
	Others	12	4.9
	Total	247	100.0

Of the total number of participants, 61 (24.7%) reported to have tested positive for COVID-19, 126 (51%) tested negative, and as much as 60 (24.3%) participants have not been tested. A significant number of participants,180, (72.9%) knew someone close to them who had tested positive for COVID-19 and 212 (85.8%) knew someone from their workplace who tested positive for the disease. 125 (50.6%) participants knew someone close to them who had died from COVID-19.

While we assumed medical doctors working in regular units are at a higher risk of infection with SARS-CoV-2compared to medical doctors working in COVID-dedicated units, our sample showed no such differences, as shown below.

Table II Answers to the Question Have you tested positive for Covid-19

Do you work in Covid dedicated unit?			Frequency	Percent
No	Valid	No	87	49.7
		Not tested	48	27.4
		Yes	40	22.9
		Total	175	100.0
Yes	Valid	No	39	54.2
		Not tested	12	16.7
		Yes	21	29.2
		Total	72	100.0

All Likert scale answers were combined into a single stress variable. Descriptive statistics indicated a moderate pandemic-related stress level (M = 3.32, SD = .61). A t-Student test was performed to assess whether a significant difference in pandemic-related stress exists between individuals who work in COVID-19 unit and those who work in regular units. The analysis did not found a statistically significant difference between the two groups (t_{245} = .244, p = .807).

Three other t-Student testswere conducted to test whether there was a statistically significant difference in pandemic-related stress between

i) Those who had tested positive for COVID-19 and those who had not

ii) Those who knew aclose individual who had tested positive for COVID-19 and those who did not

iii)Those who knew someone close to them who had died from COVID-19 and those who did not

iv) Those who knew someone at work who got infected with the new coronavirus and those who did not. Table II summarizes our main findings.

Table III Group differences in pandemic-related stress

Group	Significance level/p value (C.I = .95)
Individuals who had tested ositive for COVID-19 and those who had not	2.37
Those who knew a closed individual who had tested positive for COVID-19 and those who did not	1.53
Those who knew someone close to them who had died from COVID-19 and those who did not	7.66
Those who knew someone at work who got infected with the new coronavirus and those who did not	2.57

As shown in the table, the analyses found no statistically significant differences in pandemic-related stress between the compared groups.

Discussion

Healthcare providers, given the nature of their work, are exposed to the effects of the COVID-19 pandemic, whether physical or psychological, like few other groups. To our knowledge, there is no previous study assessing stress-related problems in health practitioners working in non-COVID hospitals. The present study aimed at addressing this issue by assessing COVID-related stress symptoms in health practitioners working in both COVID and non-COVID hospitals and to compare these two groups in terms of pandemic-related stress.

We assumed that health providers working in non-COVID hospitals in Bangladesh may be at an increased risk of infection with SARS-CoV-2, compared to health providers working in COVID-dedicated hospitals due to lower health security measures; our analysis found no such difference. Not surprisingly, the analyses showed no statistically significant differences between health providers working in COVID-dedicated units and those working in regular units in pandemic-related stress, which is consisted with a previous study showing that the negative effects of stress on mental health appear to be irrespective of whether the health providers work directly with infected patients[8].

At the group level, the stress level was found to be moderate, which is consisted with previous studies which have shown that, during pandemics, health professionals are at risk of significant psychological problems[1-6, 9].The present study highlights the importance of detecting stress in health professionals and developing strategies that aim at reducing the same, regardless of whether they are working in COVID-dedicated units or regular units.

Based on our sample, many medical doctors in Bangladesh get infected withSARS-CoV-2, most know both co-workers and close family members who have been infected with the virusand many have experienced the death of someone close to them as a result of COVID-19. The fact many health providers did not even get tested arguably adds additional work-related stress and may highlight the limited resources available to protect both the physical and mental health of medical doctors.

Conclusion

The COVID-19 pandemic has highlighted the flaws and limitations that characterizeddifferent medical systems all over the world. While it remains to be seen whether this experience will motivate policymakers to improve the existing health systems, we hope that this study contributes to our understanding of the effects of pandemics on medical doctors' physical and mental health and the factors that contribute to these variables in specific health environments.

Disclosure

All the authors declared no competing interest.

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Disparities in Soil Transmitted Helminthiasis between Plain and Hilly District of Bangladesh: Household Cluster Surveys of Prevalence and Intervention Status

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Abstract

Background: In 2008, Bangladesh initiated Preventive Chemotherapy (PCT) for School-Age Children (SAC) through bi-annual school-based mass drug administration (MDA) to control Soil Transmitted Helminth (STH) infections. In 2016, the Bangladesh Ministry of Health & Family Welfare (MOHFW) sought improved impact and intervention monitoring data to assess progress toward the newly adopted goal of eliminating STH as a public health problem. This study was aimed to estimate the prevalence of STH infection and prevalence of moderate to high-intensity infection (MHII) in all risk groups and to evaluate sanitation and hygiene behaviors and history and source of deworming in two districts of Bangladesh.

Materials and methods: The Nilphamari and Bandarban district were surveyed inMarch 2017. A multi-stage, cluster-sample, household survey which produced equal-Probability Samples for Preschool-Age Children (PSAC, 1–4 years) SAC (5–14 years) and adults (≥15 years) was conducted. Standardized questionnaires were administered, using Android based smart phones running an Open Data Kit application. Stool samples were collected and testing for STH prevalence and infection intensity used the Kato-Katz technique.

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Results: In all, 966 and 927 stool samples were collected from 1616 and 1566 participants respectively from Nilphamari and Bandarban Districts (Non-response rate was 40.8% and 40.2% respectively in Bandarban and Nilphamari district). Estimates of STH prevalence by risk group in Nilphamari districts ranged from 6.8 to 8.6% all with upper, 1-sided 95% confidence limits around 10%. However, STH prevalence estimates in Bandarban District ranged from 14.8 to 21.8%. Among all tested specimens, Ascaris lumbricoides was the most common STH parasite, followed by Trichuris trichiura, and hookworm. In each district, PC coverage among all risk group was below the 75% program target. Moreover, in PASC group it was significantly lower in Bandarban (21.2%) compared to Nilphamari (49.2%). Improved sanitation at home, school, or work was over 75% in Nilphamari district (86.1% and 76.8%) but below (68.1% and 59.8%) in Bandarban district.

Conclusion: Hilly district Bandarban is a high-prevalence district compared to plain district Nilphamari. The MOHFW will focus programmatic resources and supervisory efforts on Bandarban District.

Key words: Integrated survey; Preventive chemotherapy; Soil-transmitted helminthiasis; Sanitation and hygiene; Water.

Introduction

Globally, the burden of Soil-Transmitted Helminths (STHs) i.e Ascaris lumbricoides, Trichuris trichiura and hookworm (Ancylostoma duodenale and Necator americanus) infections remained high and continues to have a devastating impact on people's health especially among individuals in low- and middle-income countries[1]. In 2017, the global burden of STHs was estimated at 1.9 million Disable-Adjusted Life Years (DALYs)[2]. Moreover, currently more than one billion people are affected by STHs worldwide[1]. Tropical and subtropical regions are the most hotspot areas for STH infections, the greatest numbers of the case occur in subSaharan Africa, the Americas, China and East Asia[3].

In 2001, the World Health Organization (WHO) recommended that member states control STH morbidity through Preventive Chemotherapy (PCT) in endemic regions. The recommended guidance utilizes a school-based platform to target one high-risk group, School-Age Children (SAC) through Mass Drug Administration (MDA) to achieve at least 75% coverage consistently for five years. Once this is achieved, an impact assessment survey is recommended[4]. WHO established the goal of elimination of STH as a public health problem by 2020, defined as < 1% Moderate-to-High Intensity Infection (MHII) in at-risk Preschool-Age Children (PSAC, 1–4 years old) and School-Age Children (SAC, 5–14 years old)[5]. Women of Reproductive Age (WRA, 15–49 years old) are another WHO-identified risk group[6].

Like many developing countries, Bangladesh bears a high burden of STH. An estimated national STH prevalence of 79.8% (44% of which was MHII, of A. ascaris) among school-aged Bangladeshi children was reported in 2005[5]. Since 2013, the MOHFW has reported >75% annual national PCT coverage for SAC and currently targets 40.6 million children[6]. The Bangladesh Ministry of Health & Family Welfare (MOHFW) adopted the goal of eliminating STH as a public health problem among children in 2016, which necessitated increased program monitoring. To assess progress toward the newly adopted goal, the MOHFW and Children Without Worms developed the "Integrated Community-based Survey for Program Monitoring" (ICSPM).

Based on a standardized protocol, the ICSPM provides statistically valid, district-level estimates of STH and parasite-specific prevalence and intensity of infection for each risk group; evaluates MOHFW-reported PCT coverage; and measures sanitation coverage and specific hygiene-related behaviors. This publication compares the results of two ICSPM surveys one conducted in a plain district and another in hilly district of Bangladesh. Due to geographical location and other soci-political factors hilly areas of Bangladesh are lagged behind from the plain land[8]. So, programmatic implications might vary between plain and hilly areas of Bangladesh. There are no baseline data from the surveyed districts. Further evaluation of the ICSPM methodology is planned with the hope that the methodology will benefit other national programs that have the same programmatic goal.

Materials and methods

We surveyed Nilphamari and Bandarban districts (Figure. 1). We sampled the WHO risk groups: PSAC (1– 4 years old) and SAC (5–14 years old). The MOHFW also decided to sample all adults (≥15 years old).

Nilphamari districts			Bandarban districts		
Population: 1,907,497			Population: 388,335		
Risk group	Enrolled[a]	Provided Sample n (%)	Risk group	Enrolled[a]	Provided Sample n (%)
	n=1616	n=966		n=1566	n=927
PSAC (1-4 yrs)	274	152 (55.5)	PSAC (1-4 yrs)	256	149 (58.2)
SAC (5-14 yrs)	451	281 (62.3)	SAC (5-14 yrs)	427	243 (56.9)
Adult (>14 yrs)	891	533 (59.8)	Adult (>14 yrs)	883	535 (60.6)

Figure 1 Geographical location of the surveyed districts with enrollment and sampling rates.

[a]Number of participants who consented and answered questionnaire.

The survey protocol was approved by the Bangladesh Medical Research Council. Participation in the survey was voluntary. Informed consent was obtained from all participants ≥18 years old. Enrollment of participants < 18 years old, required consent from a parent or guardian and assent from any person 5–17 years old. Participants 1–4 years old were enrolled with consent of a parent or guardian.The IRB approved verbal consent because it considered the survey low risk and part of the routine program monitoring of STH control activities.

The ICSPM is a multi-stage, cluster-sample household survey. It expands the WHO Assessing the epidemiology of STH during a TAS moduleby including all WHO identified STH risk groups rather than SAC only[9-11]. Risk group prevalence is classified by calculating the upper, 1-sided 95% confidence limit. The prevalence range in which this

limit falls is the lowest range in which there can be 95% confidence that true prevalence lies. The target sample size of 332 persons per risk group is adequate for determining if a < 10% prevalence threshold has been achieved and for higher thresholds. Details of this approach are discussed elsewhere[9]. Villages were used as primary sampling units as data on census enumeration areas were unavailable. The number of households in a village was estimated based on 2011 national census data adjusted for population growth[12]. In all, 30 villages (Clusters) were selected using probability proportional to their size in 100-household segments. All members of the indicated risk-group(s) in a household were eligible.

Trained survey teams used Android-based smart phones running an Open Data Kit application to administer standardized survey questionnaires and collect geographic coordinates at each selected household. Sample collection and laboratory procedures Plastic stool containers, without preservative, were left at selected households overnight and collected the next morning. Survey teams instructed participants on sample collection, emphasizing depositing stool samples the morning of collection. After collection, samples were stored in coolers and transported to field laboratories within 2 h. Upon arrival, medical technologists processed samples by conducting dual-slide microscopy using the Kato-Katz technique[13]. A laboratory supervisor consulted on discordant results and independently reviewed 10% of samples.

De-identified data were stored on a secure cloud-based platform and analyzed using SPSS version 23 program while accounting for the cluster sample survey design. All estimates include two-sided 95% confidence intervals except for district-level prevalence which are designed to show the lowest WHO threshold achieved by calculating the upper, one-sided 95% confidence limit. A Chi-square test was used to test for significant differences in prevalence. p-values were considered significant if < 0.05. Intensity of infection was determined according to WHO-defined classifications (Table I). Missing data were typically addressed during data collection, however, if data were missing after data collection, they were excluded from analysis.

Table I WHO classifications of STH infection intensity (Eggs per gram of stool)[14]

Parasites	Intensity of infection		
	Light	Moderate	Heavy
A. lumbricoides	< 5000	5000 - 49,999	≥50,000
T. trichiura	< 1000	1000 - 9999	≥10,000
Hookworm	< 2000	2000 - 3999	≥4000

Results

In the two surveyed districts, 3182 participants were enrolled and completed the questionnaire. Among those enrolled, a total of 1893 (59.5%) provided enough stool sample for testing (Figure 1). The overall non-response rate among enrolled persons was 40.5% (n = 1289). It was 40.8% in Bandarban district and 40.2% in Nilphamari district.

The upper, one-sided 95% confidence limit for prevalence of any STH was < 10% in adult and above in PSCA and SAC risk groups in Nilphamari districts. In contrast, the corresponding figures were >10% among all risk groups in Bandarban district. The STH point prevalence in each risk group was significantly higher (p < 0.001) in Bandarban District than Nilphamari district.
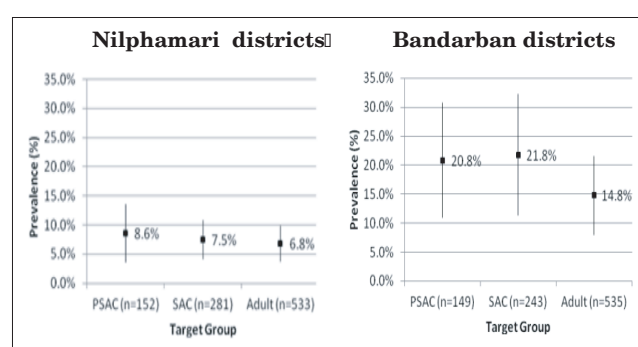
Figure 2 Prevalence (Two-sided, 95% confidence limit) of any STH by risk group and district

In Nilphamari District, MHII was 0.7%, 0.7%, and 0.4% among PSAC, SAC, and adults respectively (Fig. 3). Risk group-specific MHII estimates in Bandarban District was significantly higher than Nilphamari district (all p-values < 0.001) and well above the threshold for elimination as a public health problem (< 1%) in PASC (3.4%). The percentage of MHII by risk group are shown for two Districts in Figure 3.
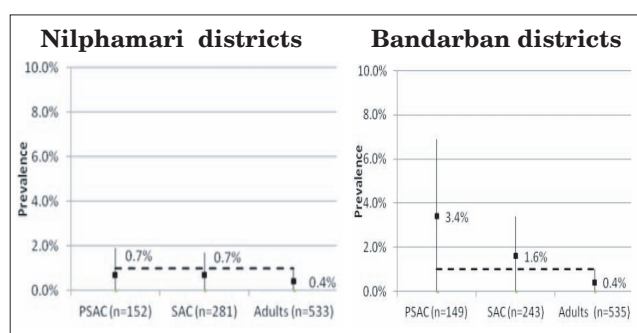
Figure 3 STH of Moderate-to-High Intensity (MHI) infection prevalence (95% CI) & WHO MHI goal by risk group and district

In both districts, A. lumbricoides was the most common STH parasite (10.1%), followed by T. trichiura(1.3%) and hookworm (0.9%). A. lumbricoides was most prevalent among SAC, followed by PSAC and adults. All polyparasitism was due to A. lumbricoides and T. trichiura and only identified in Bandarban District. Prevalence of each species was consistent across risk groups. Hookworm was the least common infection. No significant differences in STH parasite type were observed between districts.

In both districts, self-reported ICSPM PC coverage for all risk groups was below the MOHFW target of ≥75% (Range from 14.9 to 60.7)[14]. Moreover, ICSPM PC coverage was significantly lower in PSAC and adults than in SAC in Nilphamari District. In Bandarban district PC coverage was significantly lower in adults than in PSCA and SAC group. The most common source of deworming drugs for SAC was school-based MDA in, while purchasing PC was the most common source for adults in both districts.

Table II Preventive chemotherapy coverage and most common source of PC (95% CI) by risk group and district

Risk groups	Nilphamari district		Bandarban district	
	n	% [95% CI]	n	% [95% CI]
	PC received ≤6 months ago			
PSCA	152	49.2 [35.4-63.1]	149	21.2 [10.6-31.8]
SAC	281	60.7 [49.1-72.4]	243	56.6 [44.3-68.8]
Adults	533	14.9 [7.0-22.7]	535	13.2 [7.8-18.5]
	Most common source of PC[a]			
PSCA	152	Purchased: 56.0 [39.8-72.3]	149	Purchased: 90.7 [85.7–95.6]
SAC	281	School: 87.3 [78.5-96.3]	243	School: 84.7 [76.4-93.0]
Adults	533	Purchased: 44.4 [27.9-60.8]	535	Purchased: 56.5 [34.7-78.3]

[a] Survey question: "The last time you swallowed deworming medication, where did you receive it?"

Improved sanitation at home, school, or work was below 90% in both district, and significantly lower in Bandarban compared to Nilphamari district. The prevalence of improved flooring was significantly higher in Bandarban compared to Nilphamari district. The presence of a handwashing station with soap in the home was observed in < 50% of households in both districts and Nilphamari district has lower observed household coverage of handwashing stations with soap (Table III).

Table III Overall point estimates of household WASH coverage indicators (95% CI) by district

WASH indicators	Nilphamari district (n=966)	Bandarban district (n=927)
	% [95% CI]	% [95% CI]
Hand washing station with soap (Home)	16.8 [3.2-32.1]	19.1 [10.8-35.2]
Improved sanitation [a] (Home)	86.1 [61.2-97.3]	68.1 [49.7-88.2]
Improved sanitation [a] (Work/school)	76.8 [52.3-88.7]	59.8 [41.5-77.4]
Improved flooring [b]	14.1 [5.9-33.5]	46.1 [30.2-61.7]

[a]Improved sanitation defined as: flush toilet to sewer/septic, ventilated improved pit latrine, pit latrine w/ slab or composting toilet, [b] Improved flooring – bamboo, floor planks, brick, cement.

Discussion

Comprehensive, community-based surveys such as the ICSPM are intended to support STH program monitoring, particularly for advanced programs that have delivered interventions for ≥5 years. WHO recommends that programs assess, using prevalence ranges, possible changes to MDA frequency following 5–6 years of MDAs[10]. Given ICSPM results on prevalence and PC and sanitation coverage, as well as 20 completed MDA rounds, the MOHFW will pilot stopping the twice annual STH MDAs in selected areas within Nilphamari districts. WHO recommends MDAs once every 2 years in areas with ≥2% and < 10% prevalence[15]. Nilphamari district is approaching elimination of STH as a public health problem, with MHII across risk groups of < 1.0%. In, Bandarban district STH remains a public health problem in PSAC and SAC with a prevalence rate 3.4 and 1.6 respectively.

Similar to our results, high STH prevalence has been noted to be spatially focalized in Kenya, Burkina Faso and Honduras[16-18]. Additionally, a recent systematic review in Asia found substantial heterogeneity in the geographic distribution of STH between

and within countries[19]. Targeted programmatic focus by the MOHFW on high prevalence areas should improve overall intervention efficiency and impact. ICSPM results identified Bandarban District for such enhanced control efforts. In Bandarban, low PC coverage, particularly among PSAC (21.2%), likely contributes to high STH prevalence and MHII. Among PSAC who received PC in the district, 90.1% relied on purchasing the drug, indicating the need to improve MOHFW efforts to reach this risk group. Bangladesh has experienced inconsistent drug availability for PSAC partly due to procurement challenges. MDAs for SAC use drug donated through WHO, while there is no available donation for PSAC. Regardless of the impressive PC coverage of SAC, the MOHFW is unlikely to eliminate STH as a public health problem with the generally low coverage of PSAC. In surveyed districts, 49.2% was in Nilphamari district-level PSAC coverage.

Although MOHFW does not deliver WASH interventions, WASH partners could use ICSPM data to geographically target interventions. Additionally, the low prevalence of improved household flooring and of home hand washing stations with soap highlights the need for behavioral interventions in in both Nilphamari and Bandarban Districts.

In Bandarban, enhanced MOHFW supervision will further MOHFW efforts to identify and address programmatic gaps. Increased supervision, from national, division, and district personnel, will build capacity of local personnel through one-on-one training. Increased supervision will also improve adherence to established program protocols. In Bandarban, sub-districts with markedly higher STH prevalence warrant attention.

Limitations

The ICSPM surveys had some limitations including a higher than expected stool nonresponse rate and possible recall bias (Particularly the responses to the history and location of deworming questions). Additionally, the timing between the stool sample deposit by the survey respondents and testing in the laboratory may have been longer than ideal due to geographical challenges. This may have underestimated the hookworm prevalence slightly, but there is only one published study that documents the ideal specimen testing interval for hookworms and additional studies have shown little or no hookworm in south Asia[20].

Conclusions

After 23 rounds of school-based MDA to lower the burden of STH infection since 2008, a review of survey data from two districts of different geographical areas in Bangladesh shows that it is close to eliminating the infection as a public health problem from the district in plain land. In contrast, the prevalence of STH infections remains high among children and poses an important public health problem in the Bandarban hilly district. The results of these surveys will be critical to sustain the current progress and plan corrective actions.

Recommendation

The resources freed up by a geographically-targeted approach could meet other needs including establishing ongoing parasitologic monitoring in low prevalence districtsand improving PC coverage among risk groups other than SAC. Future plans to identify and treat all community members at risk in the persistent high-prevalence pockets of Bandarban district. This survey methodology provides additional valuable information on community deworming behavior which needs further validation and studies.

Disclosure

The author declared no competing interests.

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BMI In First Phase Medical Students of Bangladesh

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Abstract

Background: Body Mass Index (BMI) is the relative measurement of body weight for height of an individual. Students generally tend to gain weight as they live in sedentary lifestyles and that causes a lot of health hazards. The purpose of the study is to assess the nutritional status of first year MBBS student and creat awareness regarding obesity among them.

Materials and methods: This cross sectional study was carried out in 151 medical students of different medical colleges of Bangladesh. The study was done from October 2020 to January 2021. Weight and height were measured by standard techniques. Body mass index was calculated using the formula-mass (Weight) in kgs/height^2 in meters.

Results: The mean BMI of the study group was 23.1. The prevalence of obesity was 5%, overweight 21%, healthy 66% and underweight 7%. Among the male students, 7% were obese, 25% overweight, 66% healthy and 1% was underweight. Among female students it was 4%, 18%, 66% and 11% respectively.

Conclusion: This study stated that being overweight is rising health problem in both male and female medical students. Overweight issue is more in male and underweight issue is more common in female. Life style modifications like healthy diet and exercise related topics should be promoted in classes to create awareness.

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Key word: BMI; Obese; Overweight; Underweight.

Introduction

Low / no physical activity, sedentary lifestyle, overeating, junk food have led to obesity and overweight at all ages in modern society. It causes a number of health problems that are responsible for illness and death in humans[1]. Obesity is considered as a serious risk factor for major diseases such as type 2 diabetes, hypertension, stroke and cardiovascular diseases. Due to obesity and it's hazards, approximately 2.8 million adults die each year[2]. The problem of overweight and obesity has been recognized worldwide as a public health problem because of these facts[3]. BMI describes relative weight for height, is not gender specific and is significantly correlated with total body fat content. Based on the World Health Organization (WHO) BMI cut-offs for the international classification of body weight, a BMI < 18.5 kg/m2 is categorized as underweight, 18.5–24.9 kg/m2 as normal and ≥ 25.0 kg/m2 as overweight, which is further classified as pre-obese (25.0–29.9 kg/m2), obese Class I (30.0–35.9 kg/m2), obese Class II (36.0–39.9 kg/m2), and obese Class III (≥40 kg/m2)[4]. Apart from the general population, prevalence of overweight and obesity is also on the rise among medical professional even at a higher rate than general population .It is alarming as they are the role models for the general population to follow in terms of a healthy weight and diet[5]. Medical students are at higher risk of obesity due to lifestyle disruptions in physical activity and unhealthy diet[2]. Sleep deprivation and irregular sleep pattern is a regular lifestyle of a medical student which can cause exhaustion and decreased concentration. Data of various researches showed that sleep deprivation may lead to obesity or overweight[6]. Another very important factor which contributes to obesity is stress. Because of it there is irregularity in diet, lack of exercise. The medical students, are in a high risk group for obesity is because medical education is stressful both physically and mentally[7]. Medical

students were the target group of particular interest for this study because they are future physicians and if they are overweight or obese, they have misconceptions about the general public. The aim of this study is to assess the nutritional status of first year MBBS students & create awareness about obesity among them.

Materials and methods

A cross-sectional survey was conducted in Army Medical College Jashore, Northern International Medical College, Dhaka and Faridpur Medical College. The study population consisted of 151 first year medical students. The participants were informed about the aim of the study and their verbal consent was taken. The study was done from October 2020 to January 2021. Weight and height were measured by standard techniques. Weight was measured using normal weighing scale in KG with no shoes. Height was recorded using a measuring tape in cm, with the individual standing straight next to the wall. Body mass index was calculated using the formula-mass (Weight) in kgs/height 2 in meters. BMI value is given in units of Kg/m^2. The data obtained was compiled in excel sheet and analyzed. Mean ± standard deviation were calculated. Data was presented in the form of graphs and tables.

Results

All the 151 study participants were in the age group 18 – 21 years of age. Out of 151 students, 59(39%) were males and 92(61%) were females. Among this 39% male, 13.55% were 18 years, 42.37% were 19 years, 37.28% were 20 years and 6.77% were 21 years old. 20.65% were 18 years, 49% were 19 years, 29.34% were 20 years and 1% was 21 years old among all the 61% female. Height <150 cm was found in only 1% female. 33.69% female were between 150-155 cm height. Between 156-160 cm height, there were 5% male and 39% female. 12% male and 20.65% female were within 161-165 cm height range. 22% male and 4% female were between 166-170 cm range. More than 170 cm height was found in 36% male and 1% female. Less than 40 kg weight was found in 1% female. 3.38% male and 29.34% female were between 40-50 kg body weight. In 51-60 kg weight range, 18.64% male and 36% female were found. 30.5% male and 29.34% female were in 61-70 kg weight range. In 71-80 kg weight, there were 32% male and 1% female. 15% male and 3% female were weighed more than 80 kg.
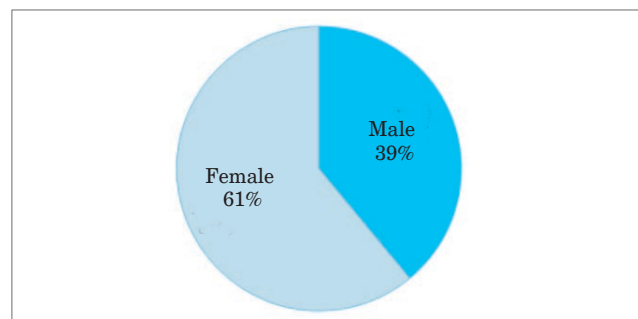
Fig 1 Distribution of male & female in study subjects

Table I Distribution of age, height and weight in study subjects

		Male		Female	
Age		Number	Percentage	Number	Percentage
	18 Years	8	13.55932	19	20.65217
	19 Years	25	42.37288	45	48.91304
	20 Years	22	37.28814	27	29.34783
	21 Years	4	6.779661	1	1.086957
Height	<150 cm	0	0	1	1.086957
	150-155 cm	0	0	31	33.69565
	156-160 cm	3		36	39.13043
			5.084746		
	161-165cm	7	11.86441	19	20.65217
	166-170cm	13	22.0339	4	4.347826
	>170cm	36	61.01695	1	1.086957
Weight	<40 kg	0	0	1	1.086957
	40-50 kg	2	3.389831	27	29.34783
	51-60 kg	11	18.64407	33	35.86957
	61-70 kg	18	30.50847	27	29.34783
	71-80 kg	19	32.20339	1	1.086957
	>80 kg	9	15.25424	3	3.26087
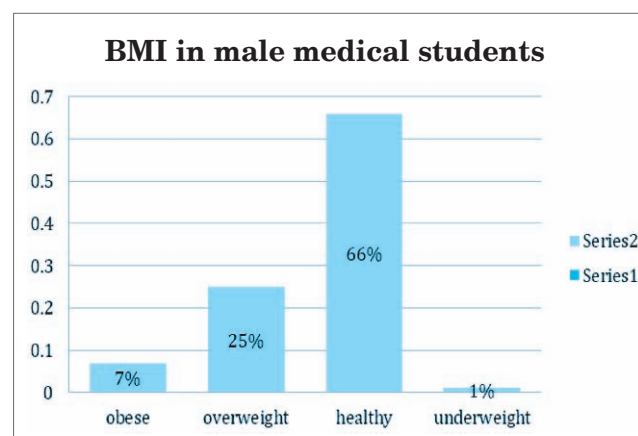
Figure 2 BMI in male study subjects

7% male medical students were found obese, 25% were overweight, 66% were healthy and only 1% was found underweight.
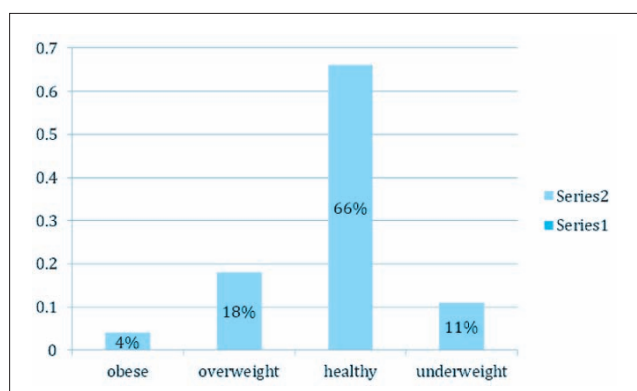
Figure 3 BMI in female study subjects

4% female medical students were obese, 18% were overweight, 66% were healthy and 11% were found underweight among the study subjects.
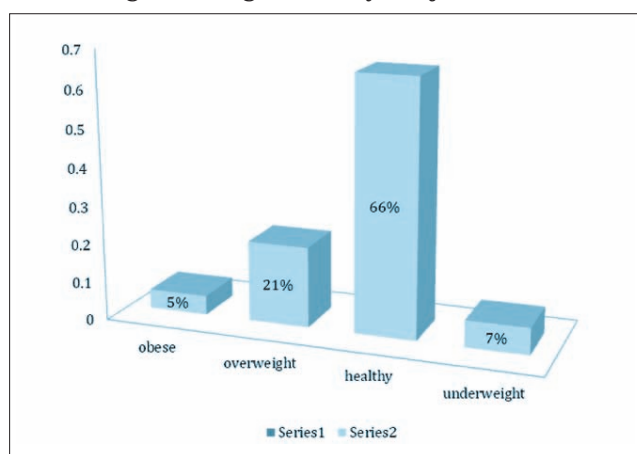
Figure 4 Percentage of obese, overweight, healthy and underweight study subjects according to BMI

Among all study subjects, 5% were obese, 21% were overweight, 66% were healthy and 7% were underweight.

Disscussion

Obesity, overweight and underweight have emerged as global epidemics in the last few decades and are therefore one of the most important research areas in the world. In addition to the general population, MBBS students are at high risk of these problems due to low physical activity and unhealthy eating habits [2,8].

This study showed that, 21% were overweight, 66% were healthy and 7% were underweight where as a study conducted in Skims Medical College showed that 81% students were healthy[9].

The present study showed only 5% of first year medical students were obese, A similar study from Haryana reported medical students' obesity to be around 3.1%[10]. Gupta et al. reported 3% obesity

among medical students of Kolkata[11]. While Chhabra et al. reported obesity to be 2% among medical students of Delhi but in a study in Saudi Arabia showed 11% students were obese which was higher than ours. Among male medical students , 7% were found obese in our study where as a study carried out in Sir Salimullah Medical College Dhaka showed only 3.59%[12-14]. 21% students were overweight in present study, Selvaraj and Sivaprakasam showed overweight to be 24.3% of medical students in similar type of study[15]. This finding was also consistent with the study conducted in Enam Medical College, Dhaka where 21.2% students were found overweight[16]. In other studies, prevalence of overweight among medical students were reported by Gupta et al. to be 17.5%, according to Chhabbra et al. it was 12%[11,12]. Current study showed male medical students showed higher prevalence of being overweight (25%) than females (18%) which was consistent with the study of Mahmood S et al[5]. But Akhter et al found higher prevalence of being overweight in females[14]. In our study, 7% of total students were underweight and female students are more prone to being underweight, which was similar as the result of study conducted in Skims Medical College, Bemina' they found 6% underweight students but no female in underweight category[9]. Akhter et al. showed in their study 11% were underweight and female were higher in number [14]. This reason might be due to the current trend for being slim rather than malnutrition.The prevalence of underweight found in medical students at Karachi was 15%[17].

Conclusion

The present study concluded that obesity is not a major problem among medical students, but that being overweight is a significant problem for both male and female medical students. However, number of male students were slightly higher in overweight category than females. It is better to take approach to overcome the overweight issue to avoid obesity related complication in future. We should encourage them to lead a healthy lifestyle through physical exercise and balanced diet.

Disclosure

All the authors declare no competing interest.

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Factors that Influence Place of Birth of First Child of Rural women of Chattogram

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Abstract

Background : First pregnancy and child birth is the most significate event of a woman's life. The aim of this study was to explore the factors influencing women's preference for place of birth of their first child in Dhalai union of Chattogram, Bangladesh.

Materials and methods : A community-based cross-sectional study was conducted on March, 2019 among 49 women who gave birth of their first child within the six months preceding the data collection time. Data was collected by interviewing the mothers attending in EPI centres for vaccination of their first child. Collected data was analysed to determine the relationship between place of delivery and the dependable variables. p value< 0.05 was considered as statistically significant.

Results : This study shows that 16% of the participants had delivered at home rest had institutional delivery either at public hospitals (28.6%) or private clinic and NGOs (55%). Participants family income and number of ANC visit had significant influence on place of delivery (p value0.035 and <0.001 respectively).98% women stated that decision of place of delivery was taken by the husband or senior members of the family. Reasons for choosing home delivery were family support, privacy and fear of unnecessary surgical interventions. Most of the women (96%) want to deliver their next baby at health facilities in future.

Conclusion : Large scale study is required to identify the barriers of maternal health seeking in this region of Bangladesh.

Key words: Adolescent; ANC; Caesarean delivery; Institutional delivery; Skilled birth attendant; Traditional birth attendant.

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Date of Submission : 02.11.2021
Date of Acceptance : 22.12.2021

Introduction

Government of Bangladesh is committed to achieve the health-related targets of Sustainable Development Goal (SDG-3) before the year 2030. Although Bangladesh has made marked improvement in health and family planning sector, Maternal Mortality Rate (MMR) is still higher than the SDG targets of reducing MMR to 70 /100000 live births by 2030[1]. According to DGHs web portal, MMR declined from 181 in 2015 to 169 per 100000 live births in 2018[1].

Throughout the world, complications of delivery and childbirth are the leading cause of death among females of reproductive age particularly in developing countries[2]. Many of these unfortunate deaths of mothers are preventable and can be e avoided if delivery is assisted by a skilled birth attendant or by institutional deliveries[3]. At the national level majority of deliveries still take place at home (62%) and more than 56% deliveries are attended by Traditional Birth Attendant (TBA) or relatives, while only 42% of births conducted by skilled personal both at home or in health facilities[4]. Moreover, there is wide disparities between rural and urban areas in the utilisation of safe motherhood facilities, with rural areas being the disadvantaged[5].

First pregnancy and child birth is the most significant event of a woman's life. According to UNFPA in Bangladesh, 1 in 3 adolescent girl became mother or pregnant by the age of 19[6]. Adolescent childbearing is generally associated with high risk of maternal and infant mortality and morbidity[7]. As The newly married adolescent have little influence on decision making in the new family, their access to healthcare and other services are mainly decided eitherby their husband or inlaws family[8].

Bangladesh has anextensive national health care system to provide maternal health care including safe delivery services under Ministry of Health and Family Welfare (MoHFW). At grass root level, Field Workers (FWA) visit to pregnant women visit at their door step and motivate them for regular antenatalcheck up and institutional delivery. Trained paramedics or CSBA in community clinic andfamily welfare visitors in union FWC provide first aid Emergency obstetric services (EmOC) to rural population at union level. While UHC provide 24 hours basic EmOC services and refers complicated cases to the district level hospitals for comprehensive EmOC facilities. Besides, comprehensive services are also available in several UHCs under special projects[9]. Though these government health centres provide safe maternal health care services including safe delivery free of charge to the rural poor people, the utilisation of these services are still poor[10].

Several studies had explored socio- economic, demographic, cultural and policy related barriers that deter women from utilisation of maternal health care and safe delivery services in Bangladesh[11-15]. However, there are scarcity of recent analysis about influencing factors of place of delivery and delivery assistance particularly in rural areas of Chattogram division of Bangladesh. The objective of this study was to identify the influencing factors of place of first birth among rural women.Findings of this survey will identify the potential areas that need intervention by the policy makers to ensure institutional deliveries.

Materials and methods
This is a community based, descriptive cross-sectional study to identify the determinants of preferences of rural women in Bangladesh about the place of delivery (Home, public hospital or private clinic).

The survey was carried out in Dholoi union of Hathazari, on March, 2019. Hathazari Upazila is situated north to Chattogram district with total area of 251 square kilometres. In this Upazilla, density of population is 4246 per square kilometre. Regarding health facilities, there is a 50 bedded Upazilla Health Complex, five Union Health Sub Centres, 8 Union Family Welfare Centres, one Maternity Welfare Centre, 23 Private Clinics and NGOs[16].

Dhalai is a union under Hathazari Upazila, total area is 4870 Acre, with total population of 39366 among them 16619 are female[16].

There is a Union Health Subcenter and 5 Community Clinic to provide primary health care services in this region. This union is 16 kilometres from Hathazari Upazila Health Complex (UHC) and only 5 kilometre from Nazirhat UHC. Though Hathazari UHC provide basic EmOC service, Nazirhat UHC provide comprehensive EmOC services.This region has well established transport facilities both by roads and railway with Chattogram district.

The participants of the study were women attending the EPI centres on March 2019, for vaccination (Any penta-valent vaccine) of their first child within 6 months of birth. One health assistant was recruited to take interview and to collect the data from the eligible mothers after obtaining informed verbal consent. 49 women were selected who fulfilled the inclusion criteria.

A semi-structured questionnaire form was designed in Bangla by the researcher after review of literature on determinants of place of delivery in developing countries[14,15,17-20]. This questionnaire was designed in several parts, which included socio-demographic characteristics of the mothers, ANC visits, place and mode of delivery and decision maker behind choosing that place.

The data were first checked for completeness, then analysed by Statistical Package for Social Sciences version 23. Simple frequencies and proportions were used to describe the socio-demographic and pregnancy related characteristics of the participants and Chi-square test was used to assess the relationship between place of delivery and the explanatory variables. For this study, p-value ≤0.05 was considered as statistically significant. Finally, the results were presented in the form of tables, figures and sentences.

Verbal informed consent was taken from individual mother. Participants had the right to quit from the study at any time during interview. Confidentiality of all the information was maintained in the course of the study.

Results
A total of 49 women participated in the study. Among them 16.3% delivered at home and rest had institutional delivery either at public hospitals (28.6%) or private hospitals and NGOs (55%).

Table I shows the influence of socio-demographic characters of the participants on place of birth. All of them were house wife and majority of them were Muslim and only 4.08% were Hindu. There was no illiterate participant. Though women or their husband's education level had no significant influence on place of birth, all couple with HSC or higher education preferred institutional birth of their first child. The economic status of the participants had significant influence on choice of place of delivery (p=0.035%). 62.5% women who delivered at home had lower family income (less than 10,000 taka/month) in contrast 63% women who delivered at private clinics had monthly family income more than 20000 taka.

Number of Antenatal Care (ANC) visits had significant influence on the choice of place of first birth (p<0.001). Every participant of this study had attended at least one antenatal care visit during pregnancy. 3 participants who had only one visit liked to deliver either in home or public facility.78% of women who had delivered at any public or private health facilities had 2 to 4 ANC visit. Majority of the women who had more than 4 ANC visit delivered at private clinics and none of this group delivered at home.

Table I Demographic variables and Antenatal visit of the participants and preferred place of first birth

	Home (n=8)	Public hospital (n=14)	Private clinic (n=27)	p value
Age in years				0.27
15-19	2(25%)	9(64%)	14(52%)	
20-24	6(75%)	5(36%)	11(41%)	
25-29			2(7%)	
>30				
Women's education				0.39
Illiterate				
Class5	3(38%)	2(14%)	2(7%)	
SSC	5(62%)	9(64%)	18(67%)	
HSC		3(21.4%)	5(19%)	
Above			2(7%)	
Husband's education				0.4
Illiterate				
Class 5	3(38%)	3(21.4%)	4(15%)	
SSC	5(62%)	8(57%)	15(55%)	
Above		3(21.4%)	8(30%)	
Monthly income in taka				0.035*
<10000	5(62%)	5(36%)	2(7%)	
10000-20000	3(38%)	6(43%)	8(30%)	
20000-30000		3(21%)	16(59%)	
>30000			1(4%)	
Number of ANCvisit				<0.001*
No visit				
1-2 visit	2(25%)	1(7%)		
2-4 visit	6(75%)	11(79%)	21(78%)	
>4 visit		2(14%)	6(22%)	

Note-* p<0.05,statistically significant.

In our study, a greater proportion of mothers (86%) delivered their first child at health institution like public facilities, private clinics and NGOs (Figure-1). Public facilities included primary health centres like community clinics, union FWC, Upazilla Health Complexes (Both Hathazari and Nazirhat) and tertiary hospital (Chittagong Medical College Hospital). In private clinics all the deliveries were conducted by doctors compared to public facilities and NGOs where nurses and midwives mostly attended the birth. Among the home deliveries 62.5% birth conducted by Traditional Birth Attendants (TBA/Dai) rest delivered by Skilled Birth Attendants (SBA). 59% of the study population had vaginal birth and rest had caesarean delivery. Majority (71%) of the women who delivered at public facilities had vaginal birth compared to private clinics where 60% had caesarean delivery. Almost all women (94%) expressed their wish to deliver their next child at any health facilities.

Preferred place of delivery
- Home
- Public facility
- Private clinic & NGO

16.33%
28.57%
55.10%
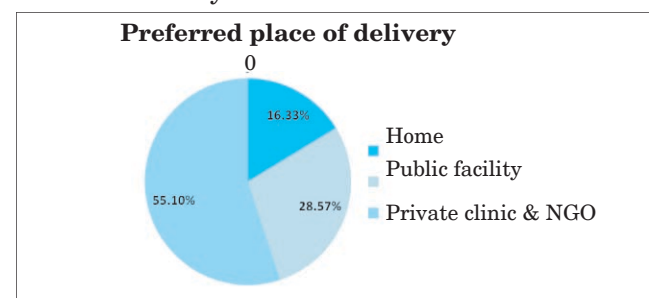
Figure 1 Prefered place of delivery

Figure 1 shows that 16% women had delivered their first child at home and 55% at private clinics or NGOs. Decision makers play a key role in choosing place of birth of the first child of a new mother. Only 2% of the participating women could decide the place of delivery by themselves. The study reveals, women's husband (47%) and senior members of the family (43%) took the decision regarding place of child birth (Figure 2).
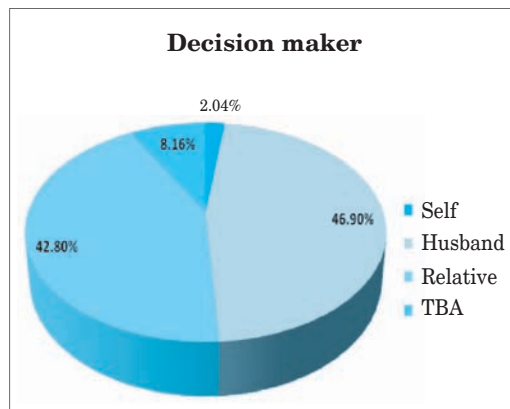
Figure 2 Decision maker to choose the place of birth

Figure 2 shows that 47% women depends on their husbands and 43% depends on their relatives for the decision of place of delivery of first baby.

According to table II, 50% of the women who had delivered at home stated that they wanted natural vaginal birth. They had fear of unnecessary operative intervention like caesarean section in hospital. 25% women choose home for family support, comfort and privacy, rest 25% women relied on TBA. Reasons behind choosing public health facilities were safe vaginal delivery, low cost services and advice by health care providers during ANC visit. The most common reason (41%) for choosing private clinics was presence of recognized obstetric risk factors like preeclampsia, foetal distress and mal-presentation. 4 women were referred to private clinic after failed trial of labour at home by Dai.

Table II Reason stated by the women for the preference of birth place

Reasons	Number	Percentage (%)
Home (n=8)		
Family support and privacy	2	25%
For vaginal delivery	4	50%
TBA is more reliable	2	25%
Public hospitals (n=14)		
Safe vaginal delivery	9	64%
Low cost	3	21.43%
On medical advice	2	14.28%
Private clinics (n=27)		
Safe delivery & neonatal care	3	11.11%
On medical advice	9	33.33%
High risk pregnancy	11	40.74%
Failed trial at home	4	14.8%

Discussion

Promoting safe institutional delivery is one of the important issue to reduce the maternal and neonatal deaths. Thus the study attempted to identify some of the influencing factors of choice of women regarding preferred place of delivery. Our findings revealed that, almost 83% of the women delivered their first baby at a health facility either public hospital, private clinic or NGO in this rural settings. This result is much higher than the overall rural coverage of Bangladesh of 30.6%[9]. Reasons behind these disparities may be due to increased community awareness and female education in this region. Inaddition, the study area had relatively good access to health facilities and transportation services as compared to most of the rural areas of Bangladesh especially hilly areas and coastal areas of Chattogram division.

Low levels of female education is associated with lack of empowerment and prevent women from maternal health care seeking[18-20]. The study results revealed that preference of delivery at health facility was influenced by the level of education of the women and their partners. Women of having higher education (SSC and above) had more probability of giving birth at a health facility either public or private, compared to those with lower level of education. These findings were similar with results of previous studies which found education of the couple as a strong determinants of health care service and facility use in developing countries[18,20].

Monthly income of the family is one of significant determinants of preferred place of delivery among the rural women of Dhalai. Women from low income (<10,000/ month) were less likely to deliver at private health care facilities compared to those in the rich family (>30000/month). The disparities may be due to the financial burden on poor family associated with the seeking of health services such as cost of transportation, physician and facility fees.

In this study, frequency of ANC visit has positive correlation with institutional delivery. Previous studies in developing countries showed that the less the number of ANC visits the more likely the women to deliver at home[17,20].

In line with Sahabuddin AS, social and cultural beliefs and practices regarding pregnancy and childbirth have influence on maternal health care seeking[23]. Unsurprisingly,women from rural community had a strong preference for normal birth. The study

reveals, fear of unnecessary caesarean section at hospital was an important influencing factor in avoiding institutional birth, reported by 50% of the women who preferred home delivery. The reason reported by the rest of the women for preferring home delivery was family support (25%) and privacy (25%).

Further discussions uncovered that, the decision of the delivery place of their first child was not taken by the mother themselves but by the husband or elderly members of the in-laws and also by the TBA. Only one woman (2%) had the opportunity to decide the birth place of her first baby by herself. Similar results were reported by others studies in different countries[17,18,21].

Limitations

The study focused solely on the experience of the new mother themselves, the views and practices of health service providers, traditional birth attendant and male partners were not included.

- The study area is very small and duration of data collection is too short.
- Small number of participants might not reflect the true picture of the rest of the country.
- Quality and experience of women regarding antenatal care and delivery services were not included in this study.
- In addition, there could be recall bias.

Conclusion

The results of the study revealed that institutional deliveries are increasing day by day even in rural Bangladesh. While, age of the new mother, education level of the couples, wealth status of the family and decision of the family members had significant influence on the preference of the place of delivery. There is also evidence that health professional splayan important role in increasing institutional birth.

Recommendation

Policy makers should design maternal health related programs targeting young new mothers to ensure universal utilisation of the safe delivery services at community level.

Acknowledgement

We are thankful to all the mothers of this study, for sharing their valuable time and experience.

Disclosure

All the authors declared no competing interest.

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doi:10.1111/tmi.12503

Maternal Anthropometry and Pregnancy Outcome

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Abstract

Background : Maternal anthropometry influences pregnancy outcome. Maternal height reflects both the mother's genetic potential for growth and her early environmental experience whereas maternal pre-pregnancy weight reflects both the mother's nutritional status and her height. This study is designed to determine the influence of maternal anthropometry on maternal and neonatal outcome.

Materials and methods : This retrospective cohort study was carried out in the Department of Obstetrics and Gynecology, Sir Salimullah Medical College and Mitford Hospital, Dhaka between April 2015 and March 2016 to evaluate the mode of delivery according to maternal BMI and MUAC and to list the maternal and neonatal outcome in relation to maternal BMI and MUAC.A total of 155 pregnant women between 37 and 42 weeks of gestational age who admitted for their delivery in this hospital were included in this study. Statistical analysis of the results was obtained by using Windows based computer software devised with Statistical Packages for Social Sciences (SPSS-20).

Results : Most (71.0%) of the subjects belonged to age 21-30 years and 64.5% multigravida. Mean weight at the time of delivery was 56.5±5.7 kg/m², Mean BMI kg/m² was 23.09±2.3 and MUAC 23.0±0.88 cm.There were statistically significant ($p<0.05$) change was found with mode of delivery when compared with different BMI group. There was statistically significant ($p<0.05$) change was found only in maternal prolonged labour in different BMI group but no statistical significant ($p>0.05$) change was found in maternal outcome when compared with different MUAC group. A significant positive correlation ($r=0.107$, $p=0.033$) was found between BMI and birth weight and also a significant positive correlation ($r=0.353$, $p=0.001$) was found between MUAC and birth weight.There were statistically significant ($p<0.05$) change was found in neonatal birth weight, birth asphyxia and neonatal ICU admission when compared with different maternal BMI group but no significant ($p>0.05$) change was found in neonatal birth weight, birth asphyxia and neonatal ICU admission when compared with maternal different MUAC group.

Conclusion : Overweight pregnant women have shown strong association with pregnancy complications and outcome. Underweight women appear to have better meternal outcome than even women with BMI within normal range, but increased risk of LBW baby which have long term physical and psychological developmental effect on the baby.

Key words : Maternal anthropometry; Multigravida; Maternal and neonatal; Post partum; Pregnancy.

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Introduction

Maternal height and maternal pre-pregnancy weight have been shown to be independently related to infant birth weight[1]. Maternal height reflects both the mother's genetic potential for growth and her early environmental experience whereas maternal pre-pregnancy weight reflects both the mother's nutritional status and her height. On the other hand weight adjusted for height has no additional advantage over unadjusted pre-pregnancy weight in predicting infant birth weight[2]. Methods of adjusting weight for height have been little examined in epidemiologic studies of pregnancy outcome[3].

There is general agreement that maternal obesity is associated with an increased risk of medical and pregnancy complications including hypertension, pre-eclampsia, gestational diabetes mellitus, thrombophlebitis, labor abnormalities (Prolonged second-stage labor and shoulder dystocia), delivery after 42 weeks of gestation and caesarian delivery[4]. Operative complications among obese women undergoing caesarian delivery include increase blood loss, prolonged operative time and increase rate of postoperative infection. Post-partum haemorrhage are more frequently observed in obese patients[5]. In addition, morbid obese women are very sensitive the respiratory depressant effects of narcotic analgesic drugs. Higher pregnancy weight and its associated complications are correlated with longer hospital stay and higher costs.Moreover a population-based cohort study from Sweden clearly demonstrates increased risks of perinatal asphyxia-related complications with increasing maternal BMI in infants delivered at term[6].

The nutritional status of women is measured by Mid Upper Arm Circumference (MUAC) a strong predictor of LBW[7]. MUAC doesn't vary much during pregnancy and is therefore an appropriate measure of nutritional status than BMI or weight[8]. A MUAC of less than 23cm is considered to be a sign of poor nutrition.

According to National low birth weight survey (2003-2004) low birth rate is quite high (36%) in Bangladesh[9]. Infants are born with low weight either because they are premature (<37 weeks gestation at birth) and/or because they were having Intrauterine Growth Retardation (IUGR). Although it is generally acknowledged that the etiology of LBW is multifactorial, the majority of LBW infants in developing countries are IUGR[10,11].

Identifying determinates of LBW and preventing them help in reducing early childhood morbidity and mortality resulting from LBW. On the basis of available evidence this study will highlight selected independent factors of LBW of Bangladesh which will contribute in reducing the incidence of low birth weight in Bangladesh by evaluating the various options addressing this major public health problem.

Different studies have revealed that significant risk factors for birth weight of a newborn varies according to the geographical location and the study population. Changing lifestyles, increasing urbanization, high calorie food consumption and reduce physical activity are responsible for increasing obesity in developing countries like Bangladesh. Research has shown that obesity is associated with a higher rate of perinatal complications.

Therefore, as maternal anthropometry (BMI and MUAC) is associated with increased risk of medical and pregnancy complications like hypertension, pre-eclampsia, gestational diabetes mellitus, thrombophlebitis, labor abnormalities, postdated pregnancy and caesarian delivery, hence, this study was undertaken to find out the association between maternal anthropometry status with maternal and neonatal outcome.

Materials and methods

This retrospective cohort study was conducted in the Department of Obstetrics and Gynecology, Sir Salimullah Medical college and Mitford Hospital, Dhaka between 1st April 2015 and 31st March 2016. Ethical clearance was taken from the ethical review committee of Sir Salimullah Medical College. A total of 155 pregnant women who attended In-Patient Department of Obstetric and Gynaecology for their delivery were enrolled for the study. The pregnant women who received 1st antenatal care with documented body weight were selected. Pregnancy of <37 weeks and >42 weeks, maternal chronic disease like diabetes (Gestational DM or diabetes mellitus) Hypertension, thyroid disorder, multiple pregnancies, hisotry of previous caesarian section,history of previous pre eclampsia and major congenital anomaly of the fetus, IUD were excluded from the study. After taking informed written consent, aim and objective of study was discussed with the study subject. From each patient data was collected on variables of interest by interview, observation, clinical examination and recorded in structured questionnaire form. Relevant information about socioeconomic and obstetric status were recorded in data sheet and maternalweight, height, BMI, MUAC were meausured during admission and weight of the neonate immediately after birth. Maternalbody weight was measured by a valid and reliable weighing machine on bare foot. The measurement of weight was taken after the bladder has been emptied. The average weight (0.5kg) of the clothes was later subtracted from the measured weight. Heightwas measured on barefootin standing position with a height measuring scale. Body mass index was determined by measuring weight (kg)

divided by height square (Meter). MUAC was measured in cm in right arm at the level midway between acromion and olecranon process. Reliable neonatal weighing machine will determine the neonatal weight. Patients were followed up during delivery. Mode of delivery were documented. Labor outcomes were assessed in terms of any complication like prolong labour, shoulder dystosia, perineal tears and postpartum haemorrhage, Fetal outcomes were assessed by birth weight, birth asphyxia and any need toadmission in neonatal unit. Statistical analysis of the results was performed using Windows based computer software devised with Statistical Packages for Social Sciences (SPSS-20). The observations were presented by frequencies and percentages. The continuous variables were expressed as mean±SD (Standard Deviation). Chi-Square test was used to analyze the categorical variables, shown with cross tabulation and Pearson's correlation coefficient was used to test the relationship between anthropometric parameters with birth weight. p values <0.05 was considered as statistically significant.

Results

Table I Baseline parameters of the study subject (n=155)

Baseline parameter	Number of subjects	Percentage (%)
Age (in year)		
≤20	28	18.1
21-30	110	71.0
>30	17	11.0
Mean±SD	25.0	±4.3
Gravida		
1 (Primi)	55	35.5
≥2 (Multi)	100	64.5

Table I shows baseline parameter of the study subject. It was observed that age distribution between 21-30 years (71.0%), multigravida (64.5%) were predominant.

Table II Distribution of the study subjects by maternal anthropometric measurement (n=155)

Maternal anthropometric measurement	Number of subjects	Percentage (%)
Height (m)		
≤1.52	82	52.9
>1.52	73	47.1
Mean±SD (Range)	1.55 ±0.04 (1.47, 1.65)	
Weight at the time of delivery (kg)		
≤50	13	8.4
51-60	90	58.1
61-70	47	30.3
>70	5	3.2
Mean±SD (Range)	56.5±5.7 (44, 72)	
BMI (kg/m^2)		
<18.5 (Underweight)	18	11.6
18.5-24.9 (Normal)	122	78.7
25.0-29.9 (Over weight)	15	9.7
Mean±SD (range)	23.09±2.3 (18, 28)	
MUAC (cm)		
≤23	122	78.7
>23	33	21.3
Mean±SD (Range)	23.0±0.88 (22, 26)	

Table II shows maternal anthropometric measurement of the study patients, it was observed that mean height was found 1.55±0.04 meter. The mean weight at the time of delivery was found 56.5±5.7 kg. Mean MUAC was found 23.0±0.88 cm. Mean BMI was found 23.09±2.3 kg/m^2.

Table III Association between BMI with mode of delivery (n=155)

Mode of delivery	BMI (kg/m^2)						p value
	<18.5 (Underweight) (n=18)		18.5-24.9 (Normal) (n=122)		25.0-29.9 (Over weight) (n=15)		
	n	%	n	%	n	%	
Normal vaginal delivery	14	77.8	80	65.6	5	33.3	0.021^s
Caesarean section	4	22.2	42	34.4	10	66.7	

Table III shows statistically significant (p<0.05) change with mode of delivery when compared with different BMI group.

Table IV Association between MUAC with mode of delivery (n=155)

Mode of delivery	MUAC (cm)				p value
	≤23(n=122)		>23(n=33)		
	N	%	n	%	
Normal vaginal delivery	85	69.7	17	51.5	0.051^{ns}
Caesarean section	37	30.3	16	48.5	

Table IV shows statistically not significant (p>0.05) change with mode of delivery when compared with different MUAC group.

**Table V** Association between BMI with maternal outcome (n=155)

Maternal outcome	BMI (kg/m^2)						p value
	<18.5 (underweight) (n=18)		18.5-24.9 (Normal) (n=122)		25.0-29.9 (Over weight) (n=15)		
	n	%	n	%	n	%	
Prolonged labour							
Yes	3	16.7	22	18.0	10	66.7	0.001^s
No	15	83.3	100	82.0	5	33.3	
Shoulder dystocia							
Yes	0	0.0	1	0.8	1	6.7	0.145^{ns}
No	18	100.0	121	99.2	14	93.3	
PPH							
Yes	1	5.6	33	27.0	2	13.3	0.083^{ns}
No	17	94.4	89	73.0	13	86.7	
Perineal tear							
Yes	0	0.0	5	4.1	2	13.3	0.164^{ns}
No	18	100.0	117	95.9	13	86.7	

Table V shows statistically not significant (p>0.05) changes. Only change was found with prolonged labour when compared with different BMI group.

Table VI Association between MUAC with maternal outcome (n=155)

Maternal outcome	MUAC (cm)				p value
	≤23(n=122)		>23(n=33)		
	n	%	n	%	
Prolong labour					
Yes	20	16.4	13	39.4	0.223^{ns}
No	102	83.6	20	60.6	
Shoulder dystocia					
Yes	1	0.8	0	0.0	0.601^{ns}
No	121	99.2	33	100.0	
PPH					
Yes	30	24.6	9	27.3	0.752^{ns}
No	92	75.4	24	72.7	
Perineal tear					
Yes	4	3.3	3	9.1	0.153^{ns}
No	118	96.7	30	90.9	

Table VI shows statistically not significant (p>0.05) change in maternal outcome when compared with different MUAC group.
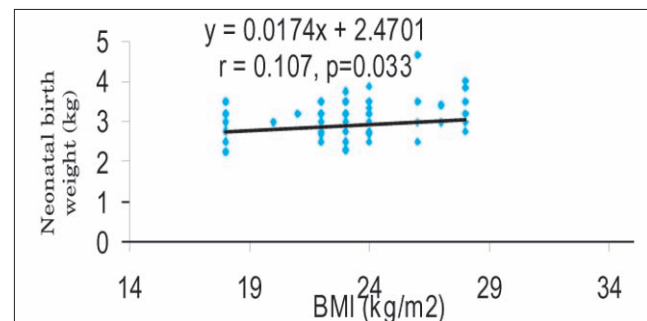
Figure 1 Scatter diagram showing significant positive correlation (r=0.107, p=0.033) between BMI and birth weight in study subjects (n=155)
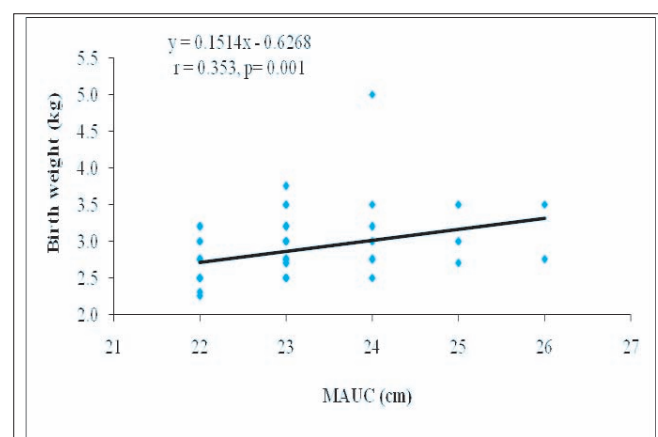
Figure 2 Scatter diagram showing significant positive correlation (r=0.353, p=0.001) between MUAC and birth weight in study subjects (n=155)

Table VII Correlation of neonatal birth weight with different sub groups of BMI

Categories of BMI (kg/m2)	Neonatal birth weight	
	Correlationco-efficient value	rp- value
Underweight (n=18)	0.308	0.152^{ns}
Normal weight (n= 122)	0.740	0.001^s
Overweight (n=15)	0.351	0.352^{ns}
Total patients	0.107	0.033^s

Table VII shows correlation of neonatal birth weight with different sub groups of BMI of the study subjects,Correlation co-efficient BMI was 0.308 in underweight, 0.740 in normal weight and 0.351 in overweignt. Birth weight was positively correlated with BMI. The correlation between BMI with normal birth weight was statistically significant (p<0.05).

Table VIII Association between BMI with neonatal outcome (n=155)

Neonatal outcome	BMI (kg/m^2)						Pvalue
	<18.5 (Underweight) n=18)		18.5-24.9 (Normal) (n=122)		25.0-29.9 (Over weight) (n=15)		
	n	%	n	%	n	%	
Birth weight (kg)							
<2.5	2	11.1	2	1.6	0	0.0	
>4	0	0.0	0	0.0	0	0.0	
Birth asphyxia							
Yes	1	5.6	4	3.3	9	60.0	0.001[s]
No	17	94.4	118	96.7	6	40.0	
Neonatal ICU admission							
Yes	1	5.6	4	3.3	9	60.0	0.001[s]

In table VIII statistically significant (p<0.05) change was found in neonatal birth weight, birth asphyxia and neonatal ICU admission when compared with maternal different BMI group.

Table IX Association between MUAC with neonatal outcome (n=155)

Neonatal outcome	MUAC (cm)				p value
	≤23 (n=122)		>23 (n=33)		
	n	%	n	%	
Birth weight (kg)					
<2.5	2	1.6	1	3.1	
2.5-4	120	98.4	32	96.9	0.606[ns]
>4	0	0.0	0	0.00	
Birth asphyxia					
Yes	2	1.6	2	6.1	0.155[ns]
No	120	98.4	31	93.9	
Neonatal ICU admission					
Yes	2	1.6	2	6.1	0.155[ns]
No	120	98.4	31	93.9	

In table IX statistically not significant (p>0.05) change was found in neonatal birth weight, birth asphyxia and neonatal ICU admission when compared with maternal different MUAC group.

Discussion

In this present study it was observed that almost three fourth (71.0%) subjects belonged to age 21-30 years. Around 17.5% women were below the age of 20 years and 5.1% were above 35 years. A study conducted by Khatun and Rahman mentioned that most of the mother of LBW babies in their study belonged to under 19 years and more than 30 years whereas it was 20-29 years for the mother with normal birth weight babies[12]. Thus the maternal age of 20-29 years has found to be the most suitable age group for giving birth to normal weight babies reported by some similar type of studies conducted by Rafati and colleagues, Demir and colleagues, Matin and colleagues, Jha and colleagues and Roy and colleagues[13-17].

In this study it was observed that almost two third (64.5%) subjects were multigravida. Lawoyin and Oyediran conducted a study which reported that parity significantly influences birth weight[18].

Azhar and colleagues conducted a study which showed that maternal Body Mass Index (BMI) is an important factor for birth weight of the newborn and incidence of LBW among the newborn was 0% for the maternal BMI ≥25 before conception and ≥30 before delivery[19]. Mohanty and colleagues and Janjua and colleagues conducted studies and reported that women who had low Body Mass Index (BMI) is more likely to give birth to LBW babies than their counterparts[20,21]. In this study it was observed that mean height was found 1.55±0.04 meter. The mean weight at the time of delivery was found 56.5±5.7 kg. Mean MUAC was found 23.0±0.88 cm. A similar study conducted by Noor and colleagues found the mean height and weight was 152.9 ± 6.3 cm and 46.7 ± 8.2 kg, respectively. Bhattacharya and colleagues conducted a similar study which found 11.7% were underweight, 58.1% had normal BMI, 21.9% were overweight, 7.7% were obese and 0.6% were morbidly obese[22].

In this present study according to different BMI, it was observed that 77.8% subjects had normal vaginal delivery in <18.5 kg/m^2 (underweight) BMI group, 65.6% in 18.5-24.9 kg/m^2 (Normal) BMI group and 33.3% in 25.0-29.9 kg/m^2 over weight BMI group. On the other hand only 22.2% subjects had underwent cesarean section in <18.5 kg/m^2 (Underweight) BMI group, 34.4% in 18.5-24.9 kg/m^2 (Normal) BMI group and 66.7% in 25.0-29.9 kg/m^2 (Over weight) BMI group, which indicates that caesarian section is more common in over weight women. Similarly, Sherrard conducted a study which mentioned that pregravid obesity increased the likelihood of primary caesarean delivery before (OR = 2.01, 95% CI 1.39–2.90) and after (OR = 2.12, 95% CI 1.86–2.42) the onset of labour[23].

Kiran conducted a study which revealed blood loss was significantly greater in the group of women with increased BMI, but the secondary postpartum haemorrhage [1.9% vs 1.5%] and blood transfusion [4% vs 3.0%] rates and number of women need to evacuation of uterus [0.4% vs 0.7%] were not significantly different[24].

In this present study it was observed that statistically significant (p<0.05) change was found only in prolonged labour when compared with different BMI group. Another study conducted by Kiran noted a statistically increased risk of prolonged labour, failed trail of instrumental delivery in the raised BMI group[24]. This current study observed that there is statistically no significant (p>0.05) change in maternal outcome when compared with different MUAC group. Kruger and Pharm conducted a study which reported that MUAC <22 cm are considered to be at risk of adverse pregnancy outcomes[25].

In this study it was observed that a significant positive significant correlation (r=0.107, p=0.033) was found between BMI and birth weight, which is closely resembled with the study conducted by Mohanty and colleagues, where the authors found a significant positive correlation (r=0.30, p<0.05) between BMI and birth weight[20]. Similarly, Jananthan and colleagues conducted a study which also observed a significant positive correlations with Birth Weight (BW) and BMI (r=0.24, p<0.05)[26].

This study showed a significant positive correlation (r=0.353, p=0.001) between MUAC and birth weight. Similarly, Mohanty found a significant positive correlation (r=0.30, p<0.05) between MUAC and birth weight in his study[20].

This study revealed statistically significant (p<0.05) change in neonatal birth weight, birth asphyxia and neonatal ICU admission. Low birth weight was more common at two extreme ends of the BMI categories, this was significant after adjusting for confounders, only in underweight women who had an Odds Ratio 1.7 (95% CI 1.2, 2.0) compared to normal.

This study observed statistically no significant (p>0.05) change in neonatal birth weight, birth asphyxia and neonatal ICU admission when compared with maternal different MUAC group. A similar study conducted by Azhar found highest (55.3%) incidence of LBW when maternal MUAC was <22.0cm and lowest (16.9%) when it was between 26.1-28cm[19]. Incidence of inadequate birth weight was 50.0% when maternal MUAC was >29cm and 31.6% when it was <22.0cm. The incidence of adequate birth weight was highest (50.0%) when maternal MUAC was >29cm and lowest (13.2%) when MUAC was <22.0cm. The finding is statistically highly significant. The difference in mean birth weight was found to be 563.16g between the highest and lowest MUAC group of mothers (p<0.05), which was also significant. The nutritional status of women measured by MUAC was also a strong predictor of LBW. Even though either acute or chronic maternal malnutrition has direct effect on the birth weight of a baby, acute maternal malnutrition has more pronounced effect revealed by the studies of Ohlsson and Sen[27,28].

Conclusion

This study showed overweight have shown strong association with pregnancy complications and outcome. So,prevention of excessive weight gain must be initiated at the pre-conception period. Obstetrical care providers should counsel their obese patients regarding the risks and complications conferred by obesity and the importance of weight loss. On the other hand underweight women appear to have better maternal outcome than women with normal BMI range, but increased risk of LBW baby which have long term physical and psychological developmental effect on the baby. So every women must maintain ideal BMI to get better pregnancy outcome.

Limitation

The present study was conducted within a short period of time. The study population was selected from one selected hospital, so that the results of the study may not be reflect the exact picture of the country. Small sample size with purposive sampling was also a limitation of the present study. Therefore, in future further studies may be under taken with large sample size.

Disclosure

All the authors declared no competing interest.

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Profile of Medico-Legal Autopsy Cases Performed in the Department of Forensic Medicine, Sylhet M. A. G. Osmani Medical College: A Four-Year Retrospective Study

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Abstract

Background : Medico-legal autopsy plays a crucial role in revealing the cause and manner of an unnatural or suspicious death. Besides, the vulnerable groups of these deaths can also be identified by reviewing the autopsy records. The present study aimed to explore the manners of deaths and vulnerable groups reported in the Department of Forensic Medicine, Sylhet M.A.G. Osmani Medical College, Sylhet, Bangladesh.

Materials and methods : Retrospective analysis of 2244 consecutive cases autopsied in the Department of Forensic Medicine was considered for this study. The review period was from July 2016 to June 2020. Frequency distribution with percentage was used to present the characteristics of the cases. Chi-square test was used to determine the vulnerable age and sex group of different manner of deaths.

Results : Among 2244 autopsied cases, more than half were male and aged between 11 to 30 years. Suicide was the most common manner of death (38.5%) followed by accident (28%) and homicide (22%). Adolescents and young females were more vulnerable to suicide, while children and the elderly were more vulnerable to accidental deaths. The rate of homicide increased with age. Road traffic accident (67%) drowning (13%), burn (5%) and electrocution (5%) were the major causes of accidental

deaths while poisoning (mostly organophosphorus compounds) and hanging were the major methods of suicides. Violent injury by a blunt or sharp weapon, ligature, and firearms were the most common objects of homicides.

Conclusion : Potentially preventable events like suicides, road traffic accidents, and drowning caused the majority of the unnatural deaths reported in our study. National action plans for the prevention of suicidal and accidental deaths especially for the productive age group and strengthening the judicial system are necessary to reduce these unnatural mortalities.

Key words: Autopsy; Accidents; Forensic medicine; Homicide; Manner of deaths; Suicide.

Introduction

A medico-legal autopsy is required to unveil the cause and manner of an unnatural or untimely death which falls under homicide, accident, suicide, or suspicious death[1]. Among the various scientific techniques employed by modern-day criminal investigations, autopsy plays the most decisive role in resolving a case.

In a densely populated country with a growing economy, unnatural deaths due to accidents, criminal offences or suicides are common. Accidental injury is one of the major causes of deaths at all ages in this country, and road traffic accident contributes most to this type of mortality. The overall mortality rate because of injury is 38 deaths per 100000 populations per year[2]. Besides, suicide is one of the major causes of death especially among adolescents and young adults. It was reported that 37 individuals out of a million people commit suicide each year[3]. Along with the accidental and suicidal deaths, violence and homicide attribute to a large portion of mortality in this country. Available data reported that every year 24 individuals out of each million population of the country become victims of homicide[4]. In these cases, the medico-legal autopsies are requested by the legal provisions of section 174 of the Code of Criminal Procedure (Cr-PC) and sections 303 to 308 of the Police Regulations of Bengal (PRB) of Bangladesh[5].

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Autopsy reports are crucial to understand the pattern of unnatural deaths as well as the picture of criminal offenses of a country or region. Vulnerable groups of people to different manner of deaths could be identified, and an action plan could be implemented to reduce the potentially preventable deaths like road traffic or workplace accidents, suicides, etc. Therefore, the objective of the present study was to identify the manner of deaths and their vulnerable groups among the autopsied cases reported in the Department of Forensic Medicine, Sylhet M.A.G. Osmani Medical College, Sylhet, Bangladesh.

Materials and methods
The present one was a retrospective cross-sectional descriptive study conducted in the Department of Forensic Medicine of Sylhet M.A.G. Osmani Medical College from July 2016 to June 2020. We studied the autopsy reports of deceased patients during the study period. All the cases brought to the department during the study period were included in the study. A review of the departmental records was done for extracting the data. The sociodemographic variables, manner, and causes of deaths, as well as autopsy findings, were recorded.

Inclusion criteria
All cases included in this study undergone a medico-legal autopsy, needing to fulfill at least one of these criteria: unnatural death, or natural death that has any of the following features: sudden and/or unexplained and/or unexpected and/or suspicious.
All referred cases were examined, and the cause of death was determined by the examining doctors (Forensic pathologists). Cases were also classified legally according to the manner of death into natural (Death due to disease) unnatural (Homicide, suicide, or accident) and undetermined. The specific unnatural manner of death may not always be determined by medical examiners and may require further police investigation and intervention.
Being a retrospective study, ethical approval was waived. Proper permission was obtained from the departmental authority for accessing and reviewing the records. The study did not require participants' consent as well
Stata version 16.0 was used for statistical analyses. Frequency distribution with percentage was used to present the characteristics of the cases. Chi-square test was used to determine the vulnerable age and sex group of different manner of death. P-value <0.05 was interpreted as statistically significant.

Results
Of the 2244 cases who underwent autopsy in the department of Forensic Medicine, Sylhet M.A.G. Osmani Medical College, 68% were men. Almost half of the cases were aged between 11 to 30 years while 18.32% were 31 to 40 years, 26% were aged more than 40 years. The majority was Muslim (89%) and brought from urban areas (50%) (Table I).

Table I Sociodemographic characteristics of the autopsy cases (n =2244)

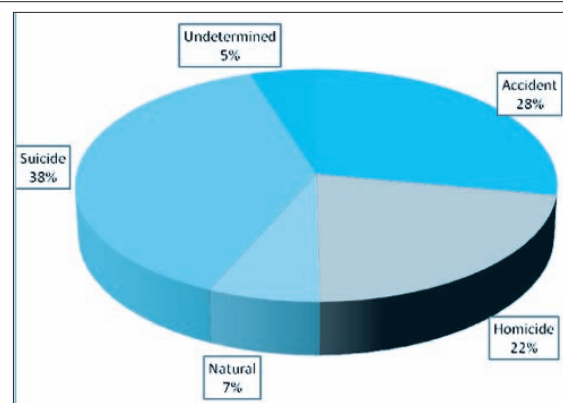| Characteristics	n	%
Age (Years)		
0-10	110	4.90
11-20	512	22.82
21-30	613	27.32
31-40	411	18.32
41-50	274	12.21
51-60	180	8.02
61-70	102	4.55
71-90	42	1.87
Sex		
Male	1521	67.78
Female	723	32.22
Religion		
Muslim	1997	88.99
Hindu	243	10.83
Others	4	0.18
Marital status		
Married	1307	58.24
Unmarried	937	41.76
Residence		
Rural	1126	50.18
Urban	1118	49.82

Figure 1 Manner of deaths of the autopsy cases (n = 2244)

Death due to suicide was the commonest manner of death (863, 38.5%) in our study. Autopsy findings revealed 28% were accidental cases (n=626), 22% homicide cases (n=491), and 7% natural deaths (n=154). The number of undetermined cases was almost 5% (Figure 1).

The data showed that accidents were the major manner of death in children aged between 0 and 10 years (48%) while suicide was the major manner of death in teenagers aged between 11 and 20 years (60%). In case of adults, suicide remained as the major manner of deaths in all age groups followed by accidents and homicide (Table II).

Although suicide was the commonest manner of death in both male and female genders, females were more vulnerable to suicide (60% in female vs 28% in male, $p < 0.001$) while males were more vulnerable to accident (32% in male vs 19% in female, $p < 0.001$) and homicide (25% in male vs 15% in female, $p < 0.001$). In case of residence, urban people were more prone to accidental deaths while rural people were more prone to suicidal and homicidal deaths (Table 2).

Table II Age and sex distribution according to the manner of deaths

Characteristics	Accident	Homicide	Natural	Suicide	Undetermined	p-value
Age (Years)						
0-10	53 (48.18)	30 (27.27)	4 (3.64)	3 (2.73)	20 (18.18)	<0.001
11-20	104 (20.31)	759 (14.65)	9 (1.76)	308 (60.16)	16 (3.13)	
21-30	151 (24.63)	114 (18.60)	14 (2.28)	313 (51.06)	21 (3.43)	
31-40	122 (29.68)	111 (27.01)	39 (9.49)	121 (29.44)	18 (4.38)	
41-50	99 (36.13)	67 (24.45)	30 (10.95)	65 (23.72)	13 (4.74)	
51-60	55 (30.56)	50 (27.78)	26 (14.44)	38 (21.11)	11 (6.11)	
61-70	26 (25.49)	27 (26.47)	26 (25.49)	15 (14.71)	8 (7.84)	
71-90	16 (38.10)	17 (40.48)	6 (14.29)	0 (0.00)	3 (7.14)	
Sex						
Male	487 (32.02)	386 (25.38)	135 (8.88)	428 (28.14)	85 (5.59)	<0.001
Female	139 (19.23)	105 (14.52)	19 (2.63)	435 (60.17)	25 (3.46)	
Religion						
Muslim	571 (28.59)	452 (22.63)	141 (7.06)	730 (36.55)	103 (5.16)	<0.001
Hindu	55 (22.63)	38 (15.64)	13 (5.35)	130 (53.50)	7 (2.88)	
Others	0 (0.00)	1 (25.00)	0 (0.00)	3 (75.00)	0 (0.00)	
Residence						
Rural	294 (26.11)	253 (22.47)	96 (8.53)	441 (39.17)	42 (3.73)	<0.001
Urban	332 (29.70)	238 (21.29)	58 (5.19)	422 (37.75)	68 (6.08)	

*p-value determined by chi-square test.

In case of the condition of the dead body, rigor mortis, open eyes and mouth and congested organs were most commonly present in case of suicidal deaths (41%, 42%, 40% and 47%, respectively). On the other hand, organs were most commonly found pale in case of accidental deaths (42%). In case of suicide, asphyxia was the most common mode of death while in case of homicides and accidents coma and syncope were the commonest mode of death (Table III).

Table III Condition of the dead body and mode of death according to the manner of deaths

Characteristics	Accident	Homicide	Natural	Suicide	Undetermined	p-value*
Rigor						
Appearing	7 (46.67)	4 (26.67)	0 (0.00)	3 (20.00)	1 (6.67)	
Present	547 (27.54)	424 (21.35)	129 (6.50)	825 (41.54)	61 (3.07)	<0.001
Disappeared	72 (29.63)	63 (25.93)	25 (10.29)	35 (14.40)	48 (19.75)	
Mouth						
Open/ partially open	438 (27.36)	345 (21.55)	112 (7.00)	643 (40.16)	63 (3.94)	<0.001
Closed	187 (29.40)	144 (22.64)	42 (6.60)	220 (34.59)	43 (6.76)	
Decomposed	1 (14.29)	2 (28.57)	0 (0.00)	0 (0.00)	4 (57.14)	
Eye						
Open/ partially open	243 (23.06)	224 (21.25)	88 (8.35)	447 (42.41)	52 (4.93)	<0.001
Closed	380 (32.23)	263 (22.31)	66 (5.60)	416 (35.28)	54 (4.58)	
Decomposed	3 (27.27)	4 (36.36)	0 (0.00)	0 (0.00)	4 (36.36)	
Organ						
Congested	458 (26.23)	348 (19.93)	82 (4.70)	829 (47.48)	29 (1.66)	<0.001
Pale	159 (42.29)	136 (36.17)	69 (18.35)	10 (2.66)	2 (0.53)	
Decomposed	9 (7.38)	7 (5.74)	3 (2.46)	24 (19.67)	79 (64.75)	
Mode						
Asphyxia	129 (11.89)	57 (5.25)	49 (4.52)	850 (78.34)	0 (0.00)	<0.001
Coma	347 (51.41)	297 (44.00)	26 (3.85)	4 (0.59)	1 (0.15)	
Syncope	150 (39.89)	137 (36.44)	79 (21.01)	9 (2.39)	1 (0.27)	
Undetermined	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	108 (100.00)	

*p-value was determined by chi-square test.

The trend analysis of the age group of the autopsy cases revealed that children and elderly people were most vulnerable to accidental deaths while the rate of homicide increased with age. Majority of the suicidal deaths occurred in the second and third decades of life and the rate decreased with age (Figure 2).
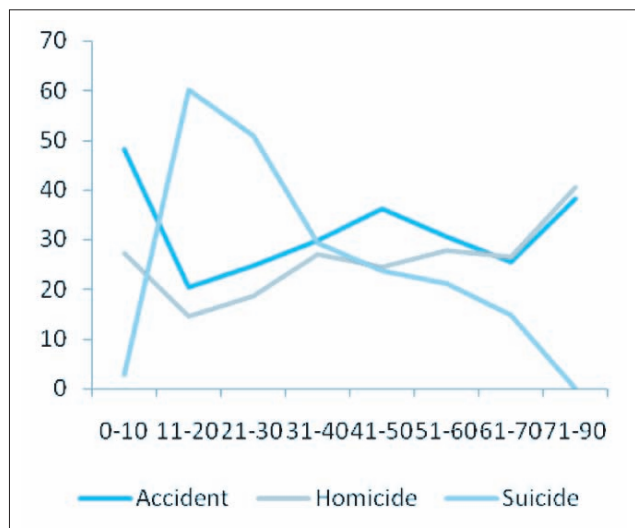
Figure 2 Manner of unnatural deaths of the autopsy cases according to age group

Road traffic accident was the major cause of accidental deaths (67%), followed by drowning (13%), burn (5%), electrocution (5%) and accidental poisoning (4%) (Figure 3a). On the other hand, injury by blunt weapon caused more than half of the homicidal deaths (58%) followed by sharp cutting or pointed weapon (25%), ligature, (6%) and firearms (4%) (Figure 3b). More than half of the suicides occurred by poisoning (58%) and the rest occurred mostly by hanging (33%). Among poisoning Organophosphorus Compound (OPC) poisoning was the commonest (53%) followed by methyl salicylate (harpic) poisoning (1.5%) benzodiazepine poisoning (1%), methylsulfate, sertraline, zinc phosphide (rat killer) poisoning, etc. (Figure 3c)
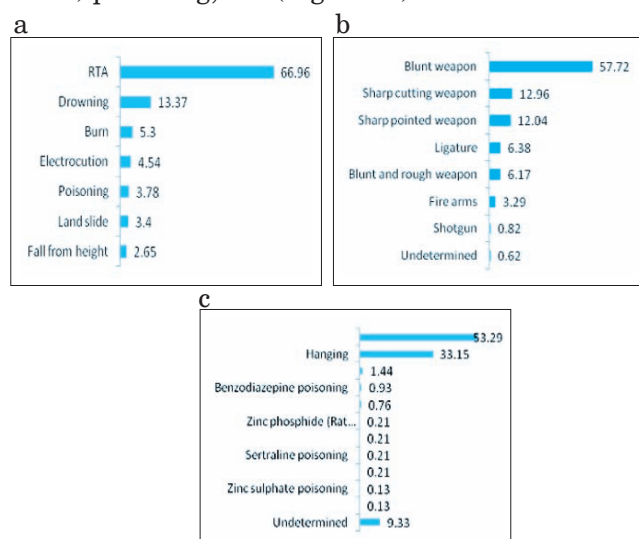

Figure 3 Causes of deaths of the autopsy cases (a. Accidental deaths, b. Homicidal deaths, c. Suicidal deaths)

Discussion

The medico-legal autopsy report is the best evidence of an unnatural death that is admissible as evidence before the court as an expert opinion.

More than half of the autopsy cases were at the second or third decades of their life and almost 68% were male. A previous study based on the mortuary profile of a tertiary care hospital reported a similar finding, where almost half of the cases were male and aged between 11 and 30 years[6]. However, another study reported almost 73% of autopsy cases were male[7].

According to our findings, suicide, accidents, and homicide were the common manner of death among the cases. A study based on the mortuary profile of Dhaka Medical College reported the accident as the predominant manner of deaths (69%) followed by homicide (12%) and suicide (8%)[6]. It is possible that the majority of the accidental deaths were not sent for autopsy in our study area that could minimize the portion. Besides another decade-long study in Dhaka city found that most of the autopsy cases are related to accident (37%), homicide (21%), and suicide (18%)[7]. Though our homicide rate corroborates with this finding, the suicidal rate was much higher in our study compared to this one. A similar profile was reported from a study from neighboring India where the most common manner of death was suicide (45%) followed by accident (44%) and homicide (5%)[8]. However, the homicide rate was higher in our study compared to that study.

Suicide remained the commonest manner of death in all ages except children and elderly people. However, it was more prevalent among adolescents and young adults. Besides, female and urban people were more vulnerable to commit suicide. Existing evidence reported that suicide was the leading cause of death by injury in the early age group in Bangladesh[9]. Some previous studies reported younger age and female sex as a significant risk factor of suicide[9-11]. Mashreky et al. reported that adolescent females (10-19year age group) were the most vulnerable group for suicide[9]. The overall suicide rate found in their study was 7.3 per 100000 people per year and the highest rate was found in the age group of 60+ years. However, in our study, the suicide rate decreased significantly among the elderly population. A similar finding was reported by Salam et al. where they reported that the risk of suicide was significantly higher among 15–24 years old compared to 25–64 years old[10]. Another study

based on 271 newspaper reports of suicides report-ed that 61% of the reported cases were below 30 years of age, and 58% were female.[11] Besides, it was reported that suicide is more common in rural areas, which corroborates our finding[9]. In our study, poisoning was the most commonly used method for suicide followed by hanging. A similar result was found in previous studies where poison-ing was the most common method of suicide[12,13]. However, a study reported hanging as the com-monest method of fatal suicidal attempts in rural Bangladesh though poisoning was the commonest method in case of non-fatal attempts[10]. Among the poisons, organophosphorus compounds (pesticides) were most commonly used as found in our study as well as previous studies[10,12,13]. Other poisons includ-ed methyl salicylate (harpic) benzodiazepine, methyl sulfate, sertraline, zinc phosphide (rat killer) etc[12].

Children and elderly people, as well as males, were more vulnerable to accidental deaths in our study. The road traffic accident was the major cause of ac-cidental deaths, followed by drowning, burn, and electrocution. Road traffic accident was ranked as the second most contributing cause of injury-relat-ed deaths among adult population of Bangladesh resulting in more than 21000 deaths annually[2,14]. People aged between 18 to 45 years were reported as the most vulnerable group to road traffic acci-dents[14,15]. Besides RTA, drowning is one of the ma-jor causes of accidental deaths in Bangladesh. The all-age mortality due to drowning was 16 per 100000 population per year[16]. However it is the leading cause of accidental deaths of children aged under 18 years with a mortality rate of 121 per 100000 children per year while the adult mortality rate due to drowning is 6 per 100000 population per year[16,17].

Homicide was the manner of death in almost 21% of our autopsy cases. Male gender and rural people were found to be more vulnerable to homicide. Sim-ilar findings were reported by a previous study, where the male had almost two times higher risk of homicide in rural Bangladesh[18]. However, that study reported that younger people were more common victims of homicide, though our findings showed that the rate of homicide increased with age. Injury by blunt weapon, sharp cutting or pointed weapon, ligature, and firearms were the commonest objects of homicide. Law enforcement and judicial body should be strengthened to reduce the rate of mortality due to homicide.

Our study has several limitations. It was conducted based on reviewing the autopsy reports, so detailed sociodemographic characteristics were not explored. A detailed description of the mode of death was not also included in the study. However, the study pro-vides an overview of the manner of deaths as well as the vulnerable group for different manner in the respective region.

Conclusion
Our study found that suicide was the commonest cause of unnatural deaths at all ages followed by accidents. Adolescent and young adults are the most vulnerable groups of these deaths which may cause a catastrophe to the respective families. A national work plan for the prevention of suicidal and accidental deaths could mitigate the burden of these potentially preventable mortalities.

Disclosure
All the authors declared no competing interest.

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Sociodemography and Evaluation of Anaemia in Different Stages of Chronic Kidney Disease (CKD) Patient

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Abstract

Background : Chronic Kidney Disease (CKD) is one of the common non communicable disease, global prevalence of which is around 10%.In Bangladesh around 16 million people suffer from CKD. Anaemia is present in both dialysis and non-dialysis CKD patients.Our study is aimed at to evaluate the sociodemography and prevalence of anaemia in hospitalized CKD patients.

Materials and methods : A cross-sectional study was done on 50 patients of different stages of CKD admitted in the Chittagong Medical College Hospital (CMCH). All the demographic and clinical data were reviewed and recorded. Data was analysed by SPSS-18 and p value <0.05 was considered statistically significant.

Results : Among the 50 study patients male was 32(64%) and female was 18(36%).Most of the patients were service holder 24(48%). Regarding age group maximum patients were within 30-50 years of age. Regarding analysis of common causes of CKD Diabetes Mellitus (DM) was found in 34(68%) hypertension was found among 38(76%). Regarding comorbid condition Ischemic heart disease was found in 12(24%) Bleeding disorder was found in 1(2%) patient and Lung disease was 9(18%). Among the 50 patients 14(28%) were found in stage 3, 9(18%) were found in stage 4 and 27(54%) were found in stage 5 of CKD.Among all study patients pallor was found among 46(92%) of patients and edema was found in 47(94%) of patients.Mean haemoglobin level in stage 5 CKD was 6.872 gm/dl, in stage 4, 7.7567 gm/dl and in stage 3 was 8.421 gm/dl. Among the all study patients microcytic hypochromic anaemia was found in 26(52%) patients and normocytic normochromic anaemia was found in 24(48%) of patients.Among the 27 stages 5 CKD patients 13(26%) had microcytic hypochromic anaemia and 14(28%) had normocytic normochromic anaemia.Both types of anaemia were also found in stage 4 and stage 3 CKD patients.

Conclusion : Prevalence of anemia was increased when stages of chronic kidney disease increased and worsened with a progressive decline in kidney function. HTN, DM, presence of proteinuria, CKD stages, and having hemodialysis history were independently associated with anemia in CKD patients.

Key words : Anaemia; Chronic kidney disease; Risk Factors; Stage of CKD.

Introduction

Anaemia is a global public health problem of all developing and developed countries which affects not only human health but also both social and economic development and occurs at all age group of the population[1]. Anemia is defined as a state in which the quality and/or quantity of circulating red blood cells is below normal or the established cutoff point defined by the World Health Organization[2]. According to the World Health Organization (WHO) diagnostic criteria, Patients are classified as anemic when hemoglobin (Hgb) is < 12 g/dl for females and <13g/dl for males[3].

Anemia with CKD is defined as a situation in which the concentration of hemoglobin in the blood is below the mean Hg level, corrected for age and sex and the main cause of anemia in CKD is the inadequate production of endogenous erythropoietin either due to functional or absolute iron deficiencies[4]. The mechanisms of anemia in CKD are multifactorial. The progressive reduction of endogenous Erythropoietin (EPO) levels has classically

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been considered to play a preeminent role. However, other factors have also been described to contribute to anemia in CKD patients, such as an absolute iron deficiency due to blood losses or an impaired iron absorption, an ineffective use of iron stores due to increased hepcidin levels, systemic inflammation due to CKD and associated comorbidities, a reduced bone marrow response to EPO due to uremic toxins, a reduced red cell life span, or vitamin B12 or folic acid deficiencies[5]. The prevalence of anemia was high in non-dialysis chronic kidney disease patients from stage 1 to the last stage. Certain factors that are associated with the development of anemia in patients with CKD include, Diabetic Nephropathy (DN) Chronic Kidney Disease (CKD) stages, Body Mass Index (BMI) smoking, leukocyte count and serum albumin[6]. The occurrence of anemia was higher for patients with both end-stage renal disease and CKD. It has also a greater prevalence among older persons, persons with diabetes, cardiovascular disease and hypertension than persons without these conditions[4].

Anemia is the commonest complication of CKD which accounts significant burden of cardiovascular diseases. CKD decreases the quality of life of patients[7]. It suggested that CKD had a significant association with anemia and is considered as a possible cause when the Glomerular Filtration Rate (GFR) is <60mL/min/1.37m2 and it is more likely to be the cause if the GFR is <30mL/min/1.73m2. The use of iron therapies and Erythropoiesis-Stimulating Agents (ESAs) has allowed improvement in patients with anaemia of CKD[8]. Anemia is more prevalent and severe as the estimated Glomerular Filtration Rate (eGFR) declines. An analysis of the cross-sectional data from the National Health and Nutrition Examination Survey (NHANES) in 2007–2008 and 2009–2010 revealed that anemia was twice as prevalent in patients with CKD as in the general population (15.4% vs. 7.6)[9]. The prevalence of anemia raised with the progression of CKD: 8.4% at stage 1 to 53.4% at stage 5. Similar data was observed in a more recent paper by the CKD Prognosis Consortium[10]. In addition, they observed an increased prevalence of anemia among diabetic patients, independent of eGFR and albuminuria.

Regarding new onset of anemia, the observational study NADIR-3 followed CKD stage 3 patients without anemia during 3 years. The authors estimated an annual rate of onset of anemia of 11% in the first year, 20% in the second year and 26% in the third year. In addition, the study revealed that those that had developed anemia significantly progressed more rapidly to CKD stages 4–5, had higher rates of hospitalizations (31.4 vs. 16.1%), major cardiovascular events (16.4 vs. 7.2%) and mortality (10.3 vs. 6.6%)[11]. Therefore,this cross sectional study aimed to estimate the prevalence of anaemia in CKD patients in Nephrology Department of CMCH which is the tertiary hospital in southern part of Bangladesh.

Materials and methods

This cross sectional observational study done on 50 patients of different stages of CKD admitted in the Nephrology Department of Chittagong Medical College Hospital. We included CKD patients admitted in Nephrology Department in CMCH with feature of anaemia. But CKD patients with malignant condition, CKD with chronic infectious disease, CKD with hematological disease were excluded. A preformed standard case record form was used for data collection. All demographic informations and clinical data, including pattern of pallor, pattern of edema, Hb level in different stages of CKD, Types of anaemia, Type of anaemia with stage of CKD, associated comorbidities (Ischemic heart disease, Bleeding disorder, Lung disease) causes of CKD (Diabetes mellitus, Hypertension) were recorded.

CKD is defined as kidney damage or Glomerular Filtration Rate (GFR) of less than 90ml/min/1.73m2 for three months or more,irrespective of cause or evidence of kidney damage[12]. Stage of CKD is classified as stage 1,2,3,4 and 5 based on GFR category (Stage 1 CKD : eGFR 90 or greater, Stage 2 CKD: eGFR between 60 and 89, Stage 3 CKD: eGFR between 30 and 59, Stage 4 CKD: eGFR between 15 and 29, Stage 5 CKD: eGFR less than 15).[13]Anaemia was defined as serum hemoglobinlevels ≥12 g/dL in women and ≥ 13 g/dL in men age ≥18years old, as recommended by the National Anemia Action Council and the World Health Organization[2]. GFR: can be estimated from calibrated serum creatinine and estimating equations, such as the Cockcroft-Gault formula (Normalized for the Body Surface Area [BSA]): (140 - Age [Years]) x weight (kg) x (0.86, if female) x 1.73/72 x serum creatinine (mg/dl) x BSA (m2)[15].

As per ADA guideline 2021. Diabetes is defined as Fasting plasma glucose equal or more than 7.0mmol/L or 2-h plasma glucose equal or more than 11.1mmol/L or HbA1c equal or more than 6.5% or in a patient classic symptoms of hyperglycaemia or hyperglycemic crisis, a random plasma

glucose equal or more than 11.1mmol/L[16]. The patient found with Blood pressure equal or more than 140/90 mm of Hg twice with or without anti hypertensive drug or normotensive on optimum dosage and good compliance was considered hypertensive[17]. 10cc venous blood underwent for Hb% and PBF examination. Blood Urea and Serum creatinine were measured by Urease GLDH and Jaffe method respectively. Fasting glucose were measured by GOD PAP method. Data were collected by interview and recording reports of laboratory investigations. All the collected data were checked and compiled and then tabulated The data were entered into SPSS for Windows[18]. All data were evaluated by using chi-square test for categorical variables and t-test for continuous variables. The results were presented in tables and figures. Statistical significance was set at p<0.05.

Results

Table I Demographic variables of the study patients.

Variables	Frequency	Percent (%)
Gender : Male	32	64
Female	18	36
Occupation : Service	24	48
House wife	8	16
Others	18	36
Age group: >30 years	8	16
30-40 years	15	30
40-50 years	14	28
50-60 years	7	14
60-70 years	5	10
>70 years	2	4

Table I showing among the 50 study patients male was 32(64%) and female was 18(36%).Most of the patients were service holder 24(48%). Regarding age group maximum patients were within 30-50 years of age.

Table 2 Comorbid disease of the patients.

Comorbidities	Frequency	Percent (%)
IHD	34	68
	16	32
Bleeding disorder	1	2
	49	98
Lung disease	9	18
	41	82

Table II showing regarding analysis of comorbid diseases Ischemic heart disease was found in 12(24%) Bleeding disorder was found in 1(2%) patient and Lung disease was 9(18%).

Table 3 Common causes of CKD

Common causes	Frequency	Percent (%)
DM	34	68
	16	32
HTN	38	76
	12	24

Table III showing regarding analysis of common causes of CKD, DM was found in 34 (68%), Hypertension was found among 38 (76%).

Table IV Staging of CKD

Stages of CKD	Frequency	Percent (%)
Stage 5	27	54
Stage 4	9	18
Stage 3	14	28
Total	49	100.0

Table IV showing among the 50 patients 14(28%) were found in stage 3, 9(18%) were found in stage 4 and 27(54%) were found in stage 5 of CKD.

Table V Clinical findings of the CKD patients (Pattern of pallor and edema)

Pallor	Frequency	Percent (%)
Present	46	92
Absent	3	6
Total	50	100.0
Edema		
Present	47	94
Absent	3	6
Total	50	100.0

Table V showing among the all study patients pallor was found among 46(92%) of patients and edema was found in 47(94%) of patients.

Table VI Hb level in different stages of CKD

Stage of CKD	Mean	n	Std. Deviation
Stage 5	6.872	27	0.8689
Stage 4	7.567	9	0.8145
Stage 3	8.421	14	0.9333
Total	7.357	50	1.1141

Table VI showing Mean haemoglobin level in stage 5 CKD was 6.872gm/dl, in Stage 4 was 7.567 gm/dl in stage 3 was 8.421gm/dl.

Table VII Pattern of anaemia among the CKD patients (%)

Types	Frequency	Percent
Iron deficiency	26	52
Normocytic normochromic	24	48
Total	50	100.1

Table VII showing among the all study patients Iron deficiency anaemia was found in 26(52%) patients and normocytic normochromic anaemia was found in 24(48%) of patients.

Table VIII Types of anaemia with stage of CKD

Types of anaemia		Stage 5	Stage 4	Stage 3
Iron deficiency	Count	13	5	8
	%within Stage of CKD	26%	10%	16%
Normocytic normochromic	Count	14	4	6
	%within Stage of CKD	28%	8%	12%
Total	Count	27	9	14
	%within Stage of CKD	100.0%	100.0%	100.0%

Table VIII showing among the 27 stage 5 CKD patients 13(26%) had Iron deficiency anaemia and 14(28%) had normocytic normochromic anaemia.Both types of anaemia were also found in stage 4 and stage 3 CKD patients.

Discussion

In the study among the 50 patients male was 64% and female was 36%. As female patients has less access to advanced health care facility in study, number of female are less. Most of the patients were service holder 48%. Patients were also included with different age group from 30 to more than 70 years. Most of the patients were within 20 to 50 years of age.

According to this study, the overall prevalence of anaemia in patients with CKD was 46 (92%).Which is higher than reported data by a study conducted in Korea (44.9%) Tanzania (33%) United States (15%) UK (6.76%) and Dessie, Ethiopia (39.5%)[18-21]. Recent NHANES report in the United States revealed the prevalence of anaemia was twice (15.4%) in CKD patients compared to the non CKD population(7.5%)[22,23]. The study demonstrated prevalence of anaemia increased with stage of CKD.

Haemoglobin level were within normal range in the stage 1&2. Haemoglobin level were 6.872 in stage 5 population studied.

A similar finding was reported from NHANES survey in the United States with prevalence of anaemia from 8.4% at stage 1 to 53.4% at stage 5. Comparable trend was also observed from recent Korean cohort with prevalence of 10% at stage 1 to 96.5% at stage 5[24,25]. Recent analysis of the National Health and Nutrition Examination Survey (NHANES) IV suggest that up to 50% of patient with Stage 2 to 5 have iron deficiency anaemia. The most commonly reported risk factor for the development of anaemia was eGFR (or CKD stage). Data consistently indicated that more severe CKD was associated with greater prevalence of anaemia. There are a number of pathophysiological mechanisms responsible for the development of anaemia alongside CKD. Compared to patients with anaemia without CKD, diseased kidneys produce less EPO than would normally be expected relative to the degree of anaemia. Whether this insufficient EPO is due to an absolute reduction in production capacity or an impaired sensitivity of kidney cells to the low tissue oxygenation that would normally stimulate production is unknown.More recent research has identified hepcidin as a key hormone implicated in disordered iron homeostasis in CKD patients. When elevated, hepcidin impairs dietary iron absorption and reduces the mobilisation of stored iron, further contributing to anaemia[26-29].

Overall, anaemia in CKD is likely to be multifactorial and other factors such as shortened red blood cell survival, greater blood losses (Especially in dialysis patients) and impaired absorption of dietary iron may further exacerbate the condition[30].

In Bangladesh,Iron deficiency anaemia is common due to poor dietary intake or sometimes occult bleeding.In this study Iron deficiency anaemia was found in 26 (48%).So anaemia correction in early stage of CKD, decreases Cardiovascular mortality. In most of Asian patients, prognosis of patients with advanced CKD is very poor because of late referral and inability to pay fori treatment.

As in other developing countries, most patients (96%) in this study presented in advanced stage of CKD (Stage 3–5) unlike the situation in developed countries. Presumed reasons for patients' late presentation for renal medical care might be due to low detection and treatment rate of CKD risk factors such as hypertension and diabetes, lack of regular

CKD screening program and insufficient follow-up care, and preference to use alternative treatment[25,31-35].

Increased prevalence of Chronic kidney disease could be partly explained by the high prevalence of risk factors like diabetes mellitus, hypertension, ischemic heart disease in the studied population (68% and 76%, respectively).The prevalence of diabetes mellitus and hypertension in India varied widely in many studies and ranged from (6-20)% and (13-58)%, respectively[36,37].

Among CKD group,64.5% had hypertension and 31.6% had diabetes.A study was conducted in Kenya[20]. patients with the presence of diabetes mellitus were 2 times more likely to develop anemia as compared to patients with non-diabetes and patient with HTN had 3 times more likely to develop anemia as compared to patients with non-hypertensive. The result indicates that the prevalence of anemia among hypertensive and DM CKD respondents is higher than those who are not. This finding suggests that any CKD patient who presents with HTN and DM should be more closely monitored for anemia.

Limitations
- Small sample size.
- Single centre study.
- Cross sectional study.

Conclusion
Prevalence of anemia was increased when stages of chronic kidney disease increased and worsened with a progressive decline in kidney function. HTN, DM, presence of proteinuria, CKD stages, and having hemodialysis history were independently associated with anemia in CKD patients.

Recommendation
Further study with large population at multiple centers is required to improve multiple aspects of CKD management, including early diagnosis and treatment of anemia. Periodic screening and intervention for anemia in CKD patients should be practiced to prevent its complication.

Disclosure
Both the authors declared no conflicts of interest.

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Obstetric Outcome of Adolescent Pregnancy Admitted in Tertiary Level Hospitals in Chattogram

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Abstract

Background : Adolescence pregnancy is a global problem occurring in high, middle and low-income countries. Studies show that, in Bangladesh teenage mothers are more likely to experience pregnancy–related complications and maternal death compared to adult mothers because of incomplete physical growth, malnutrition, socioeconomic factors. Despite remarkable progress in health sector, teenage childbearing is highly persistent in Bangladesh mostly due to constant higher prevalence of child marriage. The study was undertaken to determine the obstetric outcome among pregnant adolescent mothers.

Materials and methods : The cross sectional study was conducted at tertiary medical college hospitals in Chittagong City Corporation over a period of 6 months (July-December 2014). 108 (One hundred and eight) pregnant women were included in the study. Data was collected using a pre-designed, pre-tested, semi-structured questionnaire by face to face interview method. Data was analyzed by entering it in MS Excel worksheet.

Results: Most of the respondents got married below 18 years of age and mean age at the time of marriage was 16.94±1.03. Incidence of pregnancy induced anemia (61.8%) was most common antenatal complication. 46.67% had pre-term delivery and post-partum hemorrhage was the most common postnatal complication. Majority (61.1%) delivered baby through caesarian section followed by 38.9% Vaginal delivery.69.75 newborn had complications where prematurity and low birth weight were found most frequent neonatal outcome.

Conclusion: Adolescent pregnancy exposes to mother to many health related complications and newborn to poor birth outcome. It was associated with increased incidence of pregnancy induced anemia, gestational DM, preeclampsia, eclampsia, preterm delivery, low birth weight.

Key words: Adolescent; Adolescent Pregnancy; ANC; APH; Maternal outcome; PPH; PRO.

Introduction

Adolescence (From latin adolescere 'to mature') is a transitional stage of physical and psychological development that generally occurs during the period from puberty to legal adulthood. Adolescence is usually associated with teenage years, but its physical, psychological or cultural expressions may begin earlier and end later[1]. The period of adolescence extends from 10-19 years. The United Nations Children Fund (UNICEF), defines teenage pregnancy as "a teenage girl, usually within the ages of 13-19, becoming pregnant and refers to girls who have not reached legal adulthood, which varies across the world"[2].

It is considered a serious public health problem worldwide, approximately, 95% teenage pregnancy occur in developing countries[3]. Around the world, an estimated 15 million girls under the age of 20 years give birth, representing up to one fifth of all births[4]. The situation is more severe in South East Asian countries due to higher percentage of teenage pregnancy because of their common practice and early marriage[5]. Evidence further indicates that nearly 60% of all girls are married by the age of 18 years and one fourth is married by the age of 18 years and one fourth is married by the age of 15 years in South Asia, whereas within South Asia, the recorded adolescent pregnancy rate is highest in Bangladesh (35%) followed by Nepal (21%) and India (21%)[6]. According to health Bulletin 2014, the adolescent (10-19year) constitute about 23% of

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the population in Bangladesh. About 50% of all 15-19 years old females are married, of whom about 33% are already mothers, and another 6% are pregnant having risk to their health[7]. Complications during pregnancy and childbirth are the leading cause of death for 15-19 years old girls globally. Usually adolescent girls are anemic, malnourished and neglected. They become pregnant before achieving their own growth potential. Adolescent mothers (Ages 10-19 years) face higher risks of anemia, eclampsia, puerperal sepsis, prolonged labor, obstructed labor and systemic infections than women aged 20-24 years[8].

Adolescent child bearing has emerged as a major concern in Bangladesh due to its adverse effects on both mothers and babies born to adolescent mothers. Bangladesh is one of the vulnerable countries in South Asian region regarding early motherhood risks. Early marriage is a common phenomenon in Bangladesh. Among 6 administrative divisions of Bangladesh, Rajshahi has the highest early marriage rate (81%) compared to the lowest in Sylhet (58%)[9]. Maternal mortality for adolescent is double the national figure[10]. The infants of adolescent mothers have a higher incidence of low birth weight, prematurity, still birth and perinatal mortality. Low birth weight is one of the most common problems in adolescent pregnancy and majority of these LBW babies is due to intrauterine growth retardation. LBW survey 2004 reported that in Bangladesh, more than one out of every three children, or 1.03 million babies each year, is born with low birth weight. Hence in this background, this study is conducted at two tertiary medical college hospitals with the aim to study the obstetric outcome associated with teenage pregnancy.

Materials and methods

This cross sectional descriptive type of study was conducted at the Department of obstetrics and Gynecology, Chittagong Medical College Hospital and Chattogram Maa-Shishu-O General Hospital in Chittagong City Corporation over a period of 6 months (July-December 2014). Two tertiary level hospitals were being selected by the investigator conveniently. All adolescent pregnant women of age between 14-19 years who had recently delivered baby in these hospitals during the study period were our target population. By using statistical formula and through non-probability type of convenient sampling 108 pregnant adolescent pregnant women were enrolled in this study following the inclusion and exclusion criteria. The first contact with the study participants for data collection began immediately after delivery of the baby. The study participants were interviewed by using pretested mixed type of questionnaire according to the schedule as soon as their condition permitted. For some information, document review was also required (HB%, Blood group, Operative note, Confinement note, APGAR SCORE, birth weight) of the newborn. All the respondents were informed verbally about the purpose of the study. Full dignity and privacy was maintained in asking questions. The data was compiled, tabulated, processed in the computer according to the key variables, using statistical software IBM-SPSS version 20 for windows.

Results

Table I Distribution of respondents according to age at marriage

Age at First Child Birth	Frequency	Percentage (%)
<18 years	72	66.67%
≥18 years	36	33.33%
	108	100.00%
Age at the time of marriage	Mean ±SD	Range
	16.94±1.03	15-19

The mean age at the time of marriage was 16.94 (SD±1.03) years. Majority of the respondents 72(66.67%) were got married < 18 years of age and 36(33.33%) of women were got married ≥ 18 years of age.

Table II Status of receiving antenatal care

Status of ANC	Frequency	Percentage (%)
Irregular	91	84.26%
Regular	17	15.74%
Total	108	100.00%

91(84.3%) received irregular ANC. Only 17(15.7%) received regular ANC.

Table III Distribution of respondents according to obstetric complications

Obstetric Complication	Frequency	Percentage (%)
Ante partum		
Pregnancy with anemia	55	61.8%
Preeclampsia	12	13.54%
Intrapartum		
Pre-term labor	35	46.66%
Prolonged labor	10	13.34%
Obstructed labor	13	17.33%
Postpartum (n=19)		
PPH	09	47.36%

Pregnancy with anemia (61.8%) was most common observed ante partum complication. 46.66% had preterm labor followed by 13.34% prolonged labor, 17.33% obstructed labor. 47.36% were suffering from PPH.
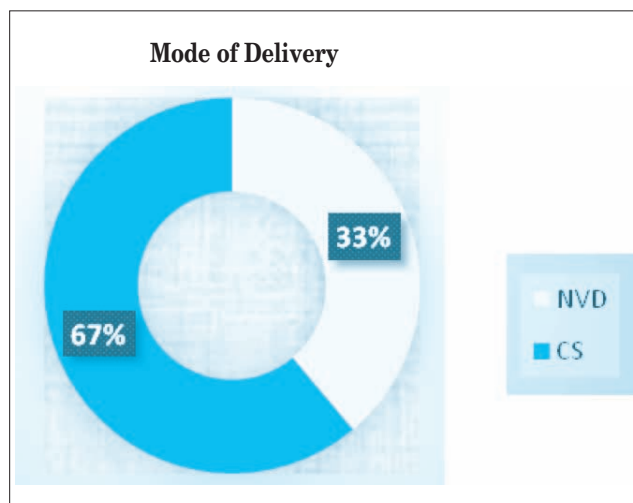

Figure 1 Distribution of respondents according to mode of delivery

67% pregnant mothers delivers through cesarean procedure followed by 33% vaginal delivery.
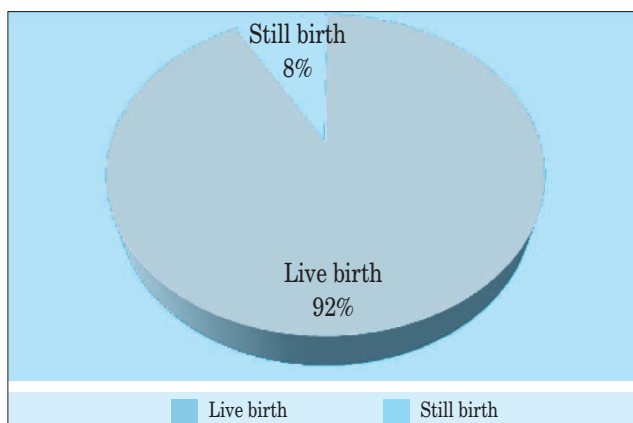

Figure 2 Distribution of respondents according to live birth and still birth

Table IV Type of complication among 69 born

Complications of baby (n=69)	Frequency	Percentage (%)
Prematurity	35	50.7%
Jaundice	19	27.5%
Convulsion	05	07.2%
Congenital anomalies	01	01.5%
Others	09	13.1%

Discussion

Teenage Pregnancy is an important public health problem worldwide. It often occurs in the context of poor social standards. According to WHO, seven countries mainly constitute for half of adolescent births, name, Bangladesh, Brazil, The Democratic Republic of Congo, Ethiopia, India, Nigeria and the united states of America.The cross sectional study was carried out to explore the outcome among pregnant adolescent mothers who admitted in the department of gynecology and obstetrics in Chittagong Medical College and Chattogram Maa-Shishu-O General Hospitals in Chittagong. It is found that; majority of the respondents belongs to age group 15-19 years. In this study, most of the respondents 81.48% were Muslim. This is a reflexion of majority of inhabitants of Bangladesh. Only 44.44% respondents completed primary level of education. Out of 108 respondents, majority 75% were homemakers. In a study by Dhoddihal et all at Belgaum, near 90% respondents were noted to be homemakers[11]. Large portion of them came from lower class and lower middle class which is similar to a study done by Nessa et al[12]. Most of the respondents got married below 18 years of age and mean age at the time of marriage was 16.94±1.03. Although for girls, legal age for marriage in Bangladesh is 18. Majority of the respondents 71.30% had first child birth ≥18 years of age followed by 28.70% had first child birth < 18 years of age. 89.8% pregnant adolescents shared that; their pregnancy was unplanned which is similar to a study where 90% pregnancy was unplanned. 74% had no history of abortion. One alarming thing is revealed from the study that; 84.26% respondents took irregular antenatal checkup as they were unaware about the importance of checkup during antenatal period. These findings are similar to a study conducted by Sultana et al showed that teen mothers are less likely to receive timely prenatal care and they have higher rate for certain risk factor for poor pregnancy outcome[13]. In the study, incidence of pregnancy induced anemia (61.8%) was most common antenatal complication which is correlated with other study. Preeclampsia contributing in13.54% which is correlated with study done by Parra-Pingel PE et al.46.66% respondents had suffered from pre-term delivery followed by 17.33% obstructed labor, 13.34% perineal tear. Caesarian section was the major route of delivery among teenage mothers compared to vaginal delivery. The

finding is not similar to a study done by Hoque et al where caesarian delivery rate was significantly higher among adult mothers compared to adolescent mothers[14]. Most of adolescent pregnancy cases were not enlisted and came to hospital in labor condition with complications because of irregular antenatal care and limited knowledge about pregnancy and labor process. Neonatal outcome was not satisfactory among teenage mothers. 50.7% newborn had prematurity followed by 27.5% neonatal jaundice, 7.2% convulsion which is correlated with study done by Aung SH. 52.53% new born had normal birth weight and 47.47% had low birth weight. This finding was different to a study conducted by Usta et al and found that teenage mothers had a significantly higher incidence of low birth weight than in the adult mothers[15].

The study revealed that, adolescent pregnancy outcome was not satisfactory and early marriage, age at conception, illiteracy, social class, age old traditions, lack of knowledge about family planning are significantly associated with adverse outcome of pregnancy among adolescence.

Conclusion

Adolescence motherhood is a major global issue due to wide range of health impacts and socio-economic consequences both for mothers and children. Present study recommends that in order to improve the teenage health multidimensional strategies should be undertaken. Increase age at marriage, public awareness, increasing access to sexual and reproductive health, in-depth studies about motherhood and ANC camp can play a significant role to minimize adverse obstetric complications, maternal and neonatal mortality and morbidity.

Disclosure

Both the authors declared no conflicts of interest.

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A Comparative Study of Effectiveness of Kangaroo Mother Care and Conventional Care of Preterm Low Birth Babies: A Randomized Control Tria

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Abstract

Background: Kangaroo Mother Care (KMC) is the low cost, humanitarian way for caring Low Birth Weight (LBW) babies predominantly for those neonates who are born before 37 weeks and weighing less than 2000 gram at birth. It embraces thermal care through skin to skin contact, proper nutrition and protects the babies from infection. To equate the efficacy of KMC and Conventional Care (CC) of preterm LBW babies on growth and physical outcomes.

Materials and methods: The randomized control trial was accompanied at Neonatal Ward of Chattogram Maa Shishu General Hospital (CMOSGH) over a 6 months period (June-December 2015). Newborn babies whom gestational age

<37 weeks and weight <2000 gram were randomizedly allocated into two groups, KMC group

(n=40) and CC group (n=40). KMC groups received kangaroo care and CC groups received only standard care (Incubators, warmers and wrapping).Both groups were assessed for physical parameters, growth-as measured daily weight, discharge length and head circumference. The data was analyzed by SPSS V.20 for windows and presented by tabular method, diagram and chart.

Results: Forty were KMC group, while forty were CC group with enrolled weight <2000 gram and

gestational age <37 weeks. After the studied period, results showed that KMC babies had attained significant growth. The weight gain of KMC babies had achieved better as compared of CC groups (KMC: 104.75 gm. ± 44.65 vs. CC: 7 46.65 gm. ± 16.65, p<0.001, the increases of head circumference (KMC: 0.57 cm vs. CC: 0.14 cm) and length (KMC: 1.08 cm vs. CC: 0.57 cm). The respiratory and heart rate were decreases and stable, mean oxygen saturation that expressed by SPO_2 was improved about 4% in KMC groups. Axillary temperature was raised during KMC and statistically significant (p<0.001). Hospital stay was shorter in KMC babies than CC (13.92 vs. 17.52). KMC was found a beneficial intervention for preterm LBW babies compared to standard care.

Conclusion: KMC affords effective thermal control, enhances growth of LBW babies. It also found stabilizes physical parameters and reduce hospital stay. Appropriate execution of KMC for preterm LBW is innocuous and operative.

Key words: Conventional care; Growth; Kangaroo mother care; Preterm baby.

Introduction

The United Nation Sustained Development Goals (SDGs) health related goals 3 states that, by 2030 end preventable deaths of newborns and children, with all countries aiming to reduce neonatal morbidity to at least as low as 12 deaths per 1000 live birth[1]. Most of countries, average 60 are the danger of missing the SDG target on neonatal mortality.The core projected reason for the increasing neonatal mortality is scarce knowledge of the employment of existing cost effective intervention and insufficient attainment of greater intercession coverage in developing countries.

WHO defines preterm as babies born alive before 37 weeks of completed gestational age. Complications of preterm birth were the foremost cause of death in children younger than 5 years of age globally in 2016, accounting for approximately 16% of

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all deaths, and 35% of deaths among newborn babies[2]. The estimated global preterm birth rate for 2014 was 10·6%.

12·0 million (81·1%) of these preterm births occurred in Asia and sub-Saharan Africa.

Bangladesh accounted for 57·9 million (41·4%) of 139·9 million live births and 6·6 million (44·6%) of preterm births globally in 2014 [2].In Bangladesh 45% of all newborn deaths are due prematurity, however, 75% of these preterm deaths can be prevented by evidence based low cost care. Government of Bangladesh has already approved Child Survival Call for Action (2013) – four priority newborn interventions including KMC for National level scale up[3].

Conventionally, preterm babies who are born before <37 weeks in hospital are kept in incubator or radiant warmer. Tertiary level neonatal intensive care of LBW babies is challenging in developing countries due to more expenditure, extra effort in maintenance, alternating power supply, insufficient cleaning of instruments and shortage of skilled stuffs.

KMC is a type of care for preterm or LBW infants by placing the infants in skin-to-skin contact with the mother or any caregivers. Dr. Edgar Rey originally started KMC in 1978 in Bagota, Columbia, as an alternative to traditional incubator care for low birth babies because of overcrowding and the scarcity of resources in his country's hospitals[4,5].

The name KMC has araised because the kangaroo's babies are also premature and their full growth and development occurs in the mother's kangaroo's pouch.

KMC has three components:

i) Thermal Care: The basic component of KMC is early continuous skin to skin contact. The infant in placed in a secured upright position against the mother's chest with the support of a sling/blinder.

ii) Kangaroo Nutrition: Exclusive breast feeding (Includes expressed breast milk) is the choice of feeding. Skin to skin contact promotes lactation and facilities the feeding interaction.

iii) Discharge and Follow-up: The baby is carefully followed up after discharge as per standard follow up protocol.

The reported advantages of KMC for preterm and LBW babies are to improved growth and development, longer soundless sleep, heart rate, and respiratory rate get stabilized, incidence of apnea and bradycardia were less, enhanced capability to maintain body temperature, better oxygen saturation, physiological stability. It also capable to exerts an analgesic effect during painful medical procedure, earlier discharged from hospital[6-19]. Though KMC as a great novelty for preterm LBW infants in developing countries, it is still not a widely practiced method in South Asia,behind this there is insufficient data as regards the beneficial influence of KMC on growth, acceptance among parents and long term outcome.

The current Neonatal Mortality Rate (NMR) in Bangladesh is around 30 per 1000 live births and

accounts for 67% of all under 5 death, 45% of all neonatal deaths are due to prematurity[20,3]. Bangladesh has already achieved the MDG 4 and on the way to achieve SDG-goals 3, neonatal death should be reduced. KMC was establishing to advance the survival of preterm or LBW babies. Skin to skin contact between mother and baby especially preterm, maintaining temperature, nutrition, and assisting early discharge from hospital. It has been recommended as an alternative to conventional care for preterm or LBW infants.The purpose of this study was to illustrate the comparison between the KMC and conventional on physiological stability, weight gain, and early outcome of preterm or LBW babies.

To equate the effects of KMC and conventional care on growth, physiological constraints (Temperature, Heart Rate, Respiratory Rate, and Oxygen Saturation) and duration of hospital stay of preterm LBW babies.

Materials and Methods
The randomized controlled trial was carried out in the Department of Neonatology, Chattogram Maa-O-Shihu Hospital over a 6 months period (June-December 2015). The neonatal ward contains 50 beds along with almost all logistic supports needed for the sick neonates. Total 80 subjects were eligible in this study that fulfilled the following inclusion and exclusion criteria.

Inclusion criteria:

i) LBW babies having weight between 1000 gm and 2000 gm.

ii) Gestational age >28 weeks and <37 weeks will be included for KMC.

iii) The baby should be in stable condition to begin KMC.

Exclusion criteria:

i) Unstable cardiac or respiratory condition who requires inotropic or ventilator supports.

ii) With and after major surgery of the neonate.

iii) Gross congenital anomalies causing life threating condition.

iv) Parents refuse for KMC intervention.

v) Babies who do not fulfill the criteria of stable preterm.

Form all the parents of selected subjects, an informed written consent was gained before enrollment and maternal demographical profile (Age, risk of sepsis, any medical problems and H/O preterm LBW) and anthropometric measurements (Weight, length, head circumference and gestational age) were collected.The eighty eligible neonates were divided randomly into two groups; Kangaroo Mother Care (KMC) and Conventional Care (CC). Randomization was achieved by lottery technique and allocation was concealed by sealed envelope technique.

In the interventional group, the babies were received skin to skin contact after that they become heamodynamically stable, placed in secured an upright position between the mother's breast dressed with a cap, socks and diaper with the support of a sling/blinder.

KMC mothers were provided a suitable dress such as front open gown and shawl and must be ensured the cleanliness and personal hygiene. Comfortable chair and bed also delivered to the mothers in KMC corner and postnatal ward. Skin to skin contact was started initially about 1 hr. in each shift and then gradually increasing at 4-6 hrs./day, during recovery with ongoing treatment and mother were stable and comfortable to give KMC. The rest hours of the day was kept according to the babies' requirement (Radiant warmer, incubator and baby cots with proper clothing).

In the control group, infants were on condition that conventional care in accordance with their needs (Radiant warmers, incubator and open cots in warm room). Both groups' mothers were permitted to enter the take care and breast feeding of the babies.

During the study period, all neonates of both groups were observed for daily weight gain by electronic weighing scale. Other anthropometrical measurements such as length were measured by using an infantometer and Occipital Frontal Circumference (OFC) was measured by regular method at time of enrollment and discharge with a non-stretchable tape. Duration of hospital stay was recorded for both groups.

We also observed the physiological indicators, oxygen saturation and heart rate by pulse oximeter, respiratory rate was counted for one minute, when the patients were in clam state and then the mean value was recorded. Axillary temperature was documented by standard method during the observation period in Kangaroo care.

The discharge criteria of both groups when they had achieved the weight gain of 15 -20 gm. /day for successive three days, no overt illness, no IV medication, maintain temperature without support in room temperature, and exclusively breast feeding.

KMC can be temporarily interrupted in case of any serious illness or medical emergency and after the stabilization of the baby was reinitiated the KMC procedure. If the baby felt discomfort like crying, pulls limbs out or the uncomfortable situation of caregiver then the procedures of KMC were discontinued.

Figure 1 Mother giving KMC in comfortable position

Ethical review committee of Bangladesh Medical Research Council accepted the protocol ethically. The purpose of the study, merits and demerits of this procedure were explained by easy understandable language and took informed written consent from the parents of enrolled neonates.

Data were composed by standard questionnaire and data collection form, assembled, and statistically

analyzed by using the computer through SPSS version 20. Chi-square test, Z test, and paired two tailed "t" test (For the physiological parameters) were done to get statistical significance. Provability value (p) of <0.05 was measured as statistically significant.

Results

In six months study period, entire 116 babies were admitted in neonatal ward of Chattogram Maa-O-Shishu Hospital of which 36 subjects were left out due to congenital malformation, severe perinatal complication and parental refuse to participate in this study. The eighty eligible babies were distributed into two groups, 40 in each group.

Among the studied groups, male were predominant than female, overall male: female ratio was 1.2:1. Age of enrollment and anthropometrical measurements of two groups were presented in Table-II. The demographical variable of maternal profile (Maternal age, gravida, PROM, and multiple delivery) were identical in entire samples, but the incidence of previous history of preterm birth was higher in KMC groups than CC groups.

In the figures 1-3, had represented that after the KMC intervention, babies had reached better growth, and the weight gain of KMC groups was higher (104.75 ± 44.65 gm.) than to the CC groups (46.65 ± 16.75 gm.). During the hospital stay, KMC babies attained significant improvement of length. The increment of head circumference of the babies was 0.57 ± 0.31 cm and 0.14 ± 0.13 cm respectively for KMC and CC groups.

Table IV depicts physiological variable of KMC and CC groups. After the analyzing the data results showed that in KMC infants respiratory rate and heart rate were stable, increased in axillary temperature and percentage of oxygen saturation than CC groups. The mean Respiratory

Rate in KMC (39.38 ± 2.10) and CC (50.28 ± 1.72). Mean O_2 saturation also improved about 4%. In KMC groups O_2 saturation was (96.83 ± 0.81) whereas that of (92.63 ± 0.81) for CC groups. Axillary temperature was raised during KMC and the change was significant (p <0.001). KMC infants were earlier discharged from hospital than CC group, which is statically significant.

Table I Distribution of sex of the babies among the study groups (n = 80)

Sex	Study Groups				Total	
	KMC		CC			
	n	%	n	%	n	%
Male	26	65.0	18	45.0	44	57.0
Female	14	35.0	22	55.0	36	43.0
Total	40	100.0	40	100.0	80	100.0

χ^2=3.232, p= 0.070. Not Significant (p > 0.05)*.

Table II Distribution of enrolled age and anthropometrical measurements of birth

	KMC (n = 40)			CC (n = 40)			Total (n = 80)		
	Mean ± SD	Median	Range	Mean ± SD	Median	Range	Mean ± SD	Median	Range
Enrolled Age of the Baby (Days)	4.48 ± 1.99	4.00	2 ~ 10	4.20 ± 1.38	4.00	2 ~ 8	4.34 ± 1.71	4.00	2 ~ 10
Birth weight (gm.)	1565.70 ± 233.33	1600	1008 ~ 1900	1548.70 ± 220.92	1525	1080 ~ 1900	1557.20 ± 225.93	1585	1008 ~ 1900
Birth length (cm)	39.85 ± 1.98	40.00	35 ~ 44	40.49 ± 1.68	40.50	37 ~ 44	40.17 ± 1.85	40.00	35 ~ 44
Birth OFC (cm)	29.17 ± 1.43	29.00	26.52~ 33	29.76 ± 1.47	30.00	27~32	29.47 ± 1.47	29.75	26.5~33

Table III Demographic variable of maternal profile

Maternal Profile		KMC (n=40)	CC (n=40)	Total (n=80)	Significance
Mother Age (Years)		24.15±4.58 (Mean ± SD)	25.05±4.80 (Mean ± SD)	24.60±4.68 (Mean ± SD)	P=0.394 NS (p >0.05)*
Gravida	G1	21(52.5)	24(60.0)	45(56.2)	p >0.05 NS
	G2	11(27.5)	6(15.0)	17(21.2)	
	G3	5(12.5)	6(15.0)	11(13.8)	
	G4	3(7.5)	4(10.0)	7(8.8)	
Multiple delivery		6(15.0)	8(20.0)	14(17.5)	p >0.05 NS
PROM		13(32.5)	13(32.5)	26(32.5)	p >0.05 NS
Previous Preterm of History		6(15.0)	1(2.5)	7(8.8)	p <0.05 Significant

PROM= Pre Mature Rupture of Membrane.
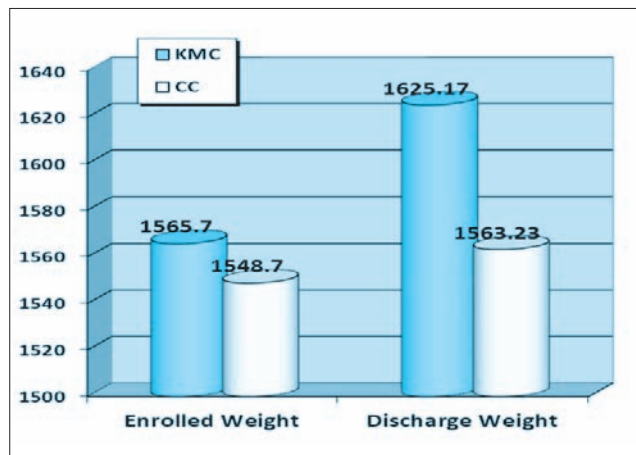NS = Not significant.

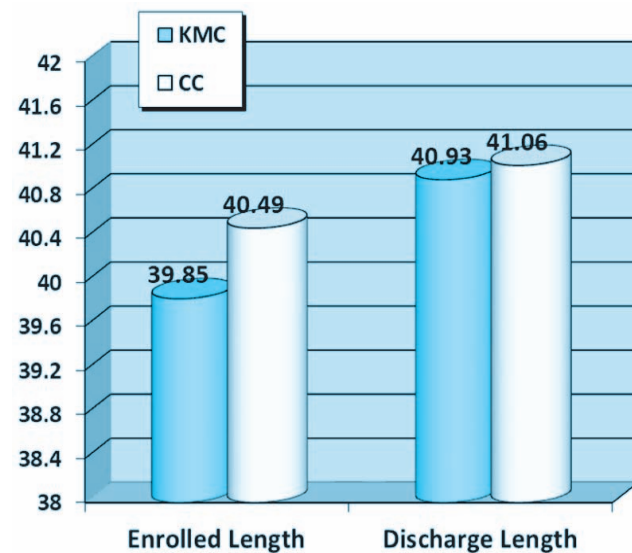**Figure 2** Mean enrolled weight and discharge weight among the study groups

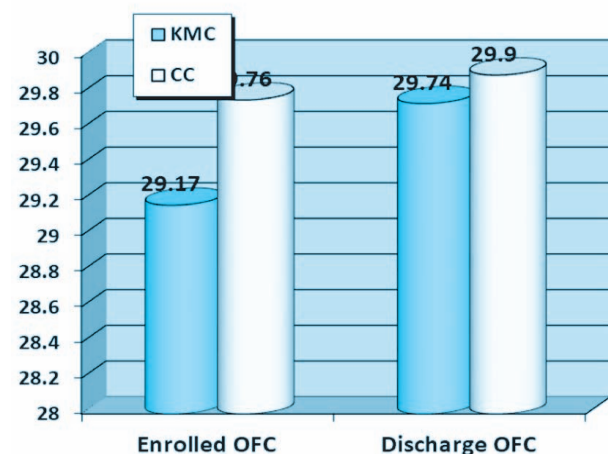**Figure 3** Mean enrolled length and discharge length among the study groups

Figure 4 Mean enrolled OFC and discharge OFC among the study groups

Table IV Effect of Physiological variables between two groups

	KMC (n=40)	CC (n=40)	Total (n=80)	Significance
Mean Heart Rate (/ Minute)	139.10 ± 1.77	150.87 ± 2.56	144.99 ± 6.32	p=0.000 Highly Significant (p <0.001)*
Mean Respiratory Rate (/ Minute)	39.38 ± 2.10	50.28 ± 1.72	44.83 ± 5.81	p=0.000 Highly Significant (p <0.001)*
Mean SPO_2 (%)	96.83 ± 0.81	92.63 ± 0.81	94.73 ± 2.26	p=0.000 Highly Significant (p <0.001)*
Temperature (^0F)	99.10 ± 0.19	98.10 ± 0.16	98.32 ± 0.18	p=0.000 Highly Significant (p <0.001)*

Table V Outcome of duration of hospital stay among the study groups (n = 80)

	Study Group	n	Mean	SD	Median	Range	Significance
Duration of Hospital Stay (Days)	KMC	40	13.92	2.18	13.00	12 – 21	p= 0.000 Highly Significant (p < 0.001)*
	CC	40	17.52	1.77	17.00	14 – 22	
	TOTAL	80	15.72	2.68	16.00	12 – 22	

Discussion

KMC is a modest and inexpensive intervention for the care of preterm LBW infants. It enriches both babies and maternal welfare and can be accomplished in any circumstances, no need any costly and heavy special equipment (e.g Special cots, incubators, and warmers). Although in the beginning, KMC was established for developing countries with limited properties, but now a days, the practice of it has extended worldwide as the knowledge about beneficial effects of KMC such as the physiological, psychological, and cost profits become gradually more familiar.

A randomized control trial was done in neonate ward of CMOSGH where we compared the efficacy of KMC and conventional care for LBW babies. After the statistical analysis of obtained data, the results showed that KMC babies weight grain were better during the hospital stay than the babies who managed by conventionally (104.75 ± 44.65 gm. vs. 46.65 ± 16.75 gm.). The same observations

found by Cattaneo et al, Charpark et al, Ramanathan et al and Syed Manazir Ali et. al due to reduce energy expenditure in KMC procedure, decreases catabolism, which helps reserves calories toward s growth[4,21-23].

The beneficial effect of KMC was revealed by other study, they recommended weekly increase of head circumference was succeeded only KMC group[24]. It has been accentuated to be one of the most essential growth indicators in LBW babies as underlying brain growth was reflected by it[25].

According to the results of the present study, significant differences were observed of physical criteria; reduction of heart rate, respiratory rate, and rise the percentage of oxygen saturation, infants receiving KMC. The facts behind these findings, babies cry less when they are placed in mothers' close contact that means skin-to-skin contact, also improve their sleep time, less stress and subsequently lower levels of cortisol[26].

Bauer et al, Fohe et al and Kadam et al also established their studies that after receiving KMC respiratory rate decreases and stable, also improve oxygen saturation[27-29]. The upright position of KMC babies maybe the possible explanation of the decreased respiratory rate, as well as the increased SPO_2. Ventilation and perfusion are gravity dependent, so and upright position optimizes respiratory function.

In the KMC infants, the chance of hypothermia was less in comparison of CC groups and also observed higher axillary temperature after KMC. This analogous findings regarding temperature also originate from Bauer et al Ludington et al and Ibe et al[27,30, 31]. The core component of KMC procedure is skin-to-skin contact provides heat from the mother as the conduction method and skin contact acts as an insulators which prevents heat loss during this procedure.

In the present and previous studies higher axillary temperature in skin-to-skin contact compromise proof that human body is a competent heat source of the body.

This study presented that the duration of hospital stay was less in KMC group when compared to CC group (13.92 ± 2.18 days vs. 17.52 ± 1.77 days, p <0.001). In another Randomized control trial, Charpak et al showed that the babies who took kangaroo care had as much as a 50% squatter hospital stay than babies who not received that[4]. Early discharge triggers the fact that better weight gain and less chance of contracting hospital-acquired infections which also the economic blessing upon the family. The mean duration of KMC provided in the study was 4.25 hours/day with a standard deviation (0.54 hours). In contrast of other studies shorter duration of skin-to-skin contact in the present study was due to the promotion of the mother alone as the Kangaroo care provider due to institutional policies preventing the entry father and other family members in the NICU or postnatal wards[4,32]. Kangaroo care advocated that with additional motivation, adequate education and participation of the family members other than mother, continuous kangaroo care in hospital and home setting is unquestionably achievable.

Conclusion

We conclude that KMC improve growth, stable physiological parameters, and plays an important role in protecting the LBW babies from hypothermia than Conventional care. KMC also shorter hospital stay, low treatment expenditures and augments growth and development during postnatal period. In 21th century, although our country had achieved from lower developing to developing country but most of the babies are born at home and the management of pre-term LBW babies at home is challenging. It is absolutely possible, satisfactory to mother and can be continued to home in the Bangladesh set up.

Recommendation

Several benefits for KMC have been reported in studies and implementation of techniques, as an effective intervention is recommended for all mother and neonates in hospital. Furthermore adequately multicenter study is needed to scrutinize the execution of KMC in the community level.

Disclosure

All the authors declared no competing interest.

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Posterior Reversible Encephalopathy Syndrome in Ante Partum Eclampsia : A Case Report

Adiba Malik[1*]

Abstract

Background: Posterior Reversible Encephalopathy Syndrome (PRES) is a clinicoradiological diagnosis and is a reversible entity presented with headache, seizure, visual loss, altered mental status, characterized by bilateral and symmetrical vasogenic edema of parietal and occipital lobe in MRI which is the imaging of choice for confirmation of diagnosis. PRES occurs in association with variety of conditions, commonly in hypertension, preeclampsia, eclampsia, following chemotherapy and immunosuppressive therapy. It has a marked female preponderance, probably because of its association with preeclampsia and eclampsia.The aim of the study the clinico-radiological profile associated complications and outcome of patients who had eclampsia with PRES.

Case Report : We presented a 35 years lady Para 2+1, previous 1 caesarean section, with diagnosed preeclampsia and GDM at 30 weeks pregnancy with eclampsia admitted on 15th March 2021 with history of repeated convulsion, vomiting,severe headache, blindness and unconsciousness. On admission, her blood pressure was 190/110 mm of Hg, pulse 100/bpm , GCS -07, and other general examination finding was normal. Abdominal examination reveiled uterus 32 weeks and fetal heart sound was good. With the impression of antepartum eclampsia, she was immediately managed with Injection magnesium sulphate and underwent caesarean section. Per operatively she was on artificial ventilation and postoperatively shifted to ICU and managed accordingly. Post operative recovery was very slow with the complain of complete blindness. Diagnosis of PRES was confirmed by MRI on 4th post operative day. She had a prolonged hospital stay of 22 days and discharged with full recovery.

Conclusion : PRES is a reversible entity when it is diagnosed early by high clinical suspicion, etiology is quickly recognized and early initiation of treatment. If not, can lead to irreversible neurological sequelae and even death.

Key words : Ante partus eclampsia; Pregnancy; PRES.

Introduction

Posterior Reversible Encephalopathy Syndrome (PRES) is a rare neurological disorder with wide range of clinical presentations and typical imaging findings of vasogenic edema in the parieto occipital lobe, first described by Hinchey et al at 1996[1,2]. The most common triggering agents of PRES include hypertensive emergencies, preeclampsia, eclampsia, chemotherapeutics, immunosuppressive agents, renal disease, autoimmune diseases, sepsis and shock[3]. PRES can occur in any age group and with a higher occurance rate in female patient probably due to its association with preeclampsia and eclampsia[4,5]. In adult patients PRES commonly occur in acute hypertension or hypertensive crisis and following chemotherapeutic agents[6]. A study found among, paediatric patients the most common cause is renal disease, another study reported higher occurance in pediatric oncology patients especially following stem cell transplantation[7,8]. Cases also reported following induced septic abortion and also following COVID 19[9,10].

The wide range of clinical presentation include acute hypertension, seizure, , nausea and vomiting, altered mental status, visual disburbances, altered level of consciousness and coma[1].

Treatment is generally aimed at targeting the underlying cause and according to symptoms with generally reversible symptoms and imaging findings in most of the cases[5].

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Poor clinical outcomes have been associated with preexistiing uncontrolled Diabetes mellitus and Posterior involvement of corpus callosum[11]. Outcomes are generally favourable with high clinical suspicion , early diagnosis and prompt initiation of treatment.

Case Report

We report a 35 years multigravida (Para 2+1, last baby delivered by caesarean section) admitted on 15th March 2021, at Chattogram Maa Shishu General Hospital with 30 weeks of pregnancy with antepartum eclampsia with GDM, presented with history of repeated convulsion at home, vomiting, severe headache, with unconsciousness. She was diagnosed as GDM at 20 weeks and preeclampsia at her 27 weeks of pregnancy. She had irregular antenatal checkup.

Physical examination revealed blood pressure 190/110 mm of Hg, pulse -100/min, Respiratory rate-18/min, GCS 07, respiratory and cardiovascular examination normal. Abdominal examination revealed Uterus -32 weeks size, FHS +, Patient was not in labour.

With the impression of antepartum eclampsia, she was immediately managed with loading dose of Magnesium Sulphate,and after counselling, immediatecaesarean section was done. A   1.4 KG asphyxiated female baby was delivered and shifted to NICU.

During surgery patient was put on artificial ventilation.Following operation she was shifted to ICU with maintenance dose of Magnesium sulphate with monitoring of respiratory rate, urine output, patellar reflex.

Laboratory reports were Hb% 13.1 gm/dl, Platelet 300000/cmm, creatinine 1.1mg/dl, S. albumin 2.95 mg/dl, S magnesium 4.1, CBG 11.4mmol/l,   CRP 111 mg/dl, High sensitive troponin 453.3 ngm /l, ProBNP 16068pg/ml, PT, APTT, D dimer ALT, AST , electrolytes were normal,

In the ICU she was managed by Antibiotics, Injectable Labetalol, Insulin, Injection Frusemide, maintenance dose of magnesium sulphate, Ivabradin and other supportive treatment.

As her GCS was not improved and on 2nd Post Operative Day (POD) CT scan of brain was done which had the findings of vasogenic edema in the parietal and occipital lobe, giving a diagnosis of PRES.

In the ICU patient was managed by Nasogastric feeding, Inj. Mannitol, Labetalol, Prazocin, Bisoprolol was added with muscle relaxants. She complained of complete blindness. In the 4th POD MRI was done which confirms the diagnosis of PRES, showed symmetrical and bilateral vasogenic edema of parietal and occipital lobe. Patient had a slow recovery with gradual improvement of GCS from the 5th POD, but vision was not improved. Fundoscopic examination excluded retinal haemorrhage.. In the 10thpost operative day, her condition was improved, complaining of blurring of vision instead of complete blindness and she was extubated and shifted to HDU and two days later she was shifted to OBGYN ward.After twenty one days hospital admission, on 4th April 2021, she was fully oriented and complete vision was acquired and was discharged from hospital with complete recovery.
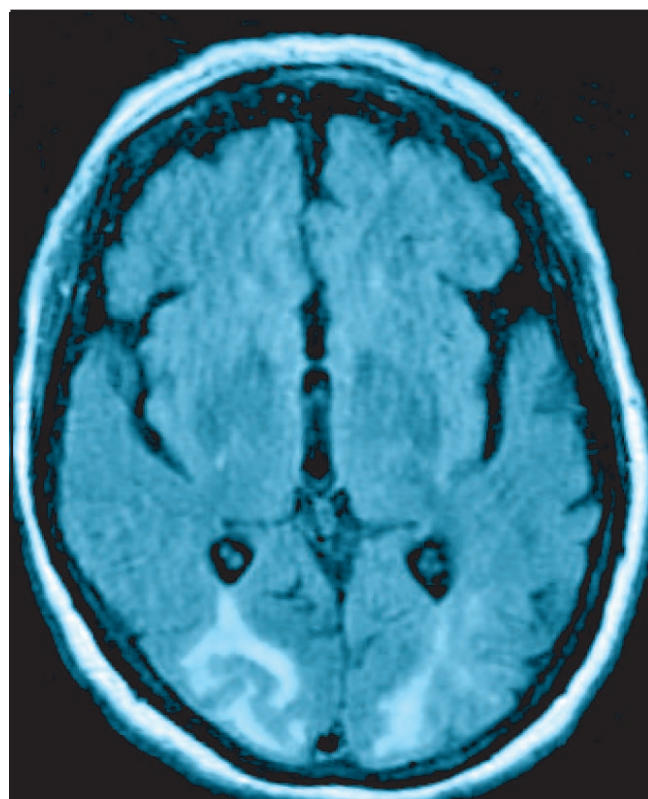

Image 1 MRI of Brain showing bilateral symmetrical edema of occipital and parietal lobe

Discussion

Posterior Reversible Encephalopathy Syndrome (PRES) is a reversible neurological entity characterized by white matter edema affecting occipital and parietal lobe. The precise pathophysiologic mechanism behind PRES remain controvertial.

There are currently two major proposed theory. The first theory propose increase arterial Blood Pressure (BP) as the primary factor[5]. Rapid rise in BP eventually overcomes the autoregulatory capabilities of cerebral vasculature causing vascular leakage and resultant vasogenic edema, resulting in blood brain barrier dysfunction with proteins passing through the tight junctions[12]. The areas supplied by the posterior circulation (Vertebral, basilar and posterior cerebral arteries) are at exceptional risk compared to anterior circulation (Internal carotid, middle cerebral and anterior cerebral arteries) due to lack of sympathetic tone of basilar artery vasculature[5]. The second major theory address the fact that upto 30% of the patients with PRES do not exhibit elevated blood pressure necessary to exceed the autoregulatory control of cerebral vasculature[13]. This theory proposes endothelial dysfunction is the primary culprit, which may caused by various endogenous and exogenous toxins[14]. This theory can explain PRES in patients receiving immunosuppressive medications, chemotherapy and also patients with sepsis[15]. In this model circulating toxins cause vascular injury with resultant development of vasogenic edema.

A marked female preponderance is observed in PRES probably due to its association with preeclampsia and eclampsia which are new onset hypertension in pregnancy with proteinuria or other end organ involvement and the later complicated with convulsion and or coma[16,17].

It is the high degree of suspicion which helps early clinical diagnosis and CT scan is often the initial test and MRI is the imaging modality of choice showing involvement are symmetrical and bilateral[18]. Management of PRES involves early diagnosis, treatment of symptomatology and correction of causative factor or primary etiology[19]. As hypertension was present in 53% of patients diagnosed as PRES andin that case treatment aimed at reduction of BP in a controlled environment[19,20]. A non rapid reduction of blood pressure is to be achieved to avoid risk of ischemic cerebral disease which can occur following drastic lowering of BP[21]. In case of preeclampsia and eclampsia treatment aimed at the timely delivery of the fetus, blood pressure management and magnesium sulphate for seizure treatment and prophylaxis[22].

Conclusion

Any hypertensive patient if presented with neurological deficit, PRES should be considered as one of the differential diagnosis. PRES is a reversible entity when it is diagnosed early by high clinical suspicion, etiology is quickly recognized and early initiation of treatment. If not, can lead to irreversible neurological sequelae and even death.

Disclosure

The author declared no competing interest.

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