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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 Medical 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.

Manuscript should be typed in English (Font size and style : 12, Times New Roman) on one side of white bond paper of A4 size with margins of at least 2.5 cm, using double space throughout.

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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.

3 (Three) to 10 (Ten) key words may be provided below the abstract using terms from the medical subject heading (Index Medicus, NLM, USA).

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Editorial : Its a opening article. Based on current affairs of Medical Science with any disciplines. Maxium length of the editorial may be with in 1000 words and number of references maxium in 10 (Ten).

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

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- Conclusion
- Disclosure

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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.

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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.

Journal references should have the name of the authors, title of the article, editors, name of the journal volume and issue number, place of publication, the publisher, the year and relevant pages.

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.

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- 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.

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

Declaration

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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.

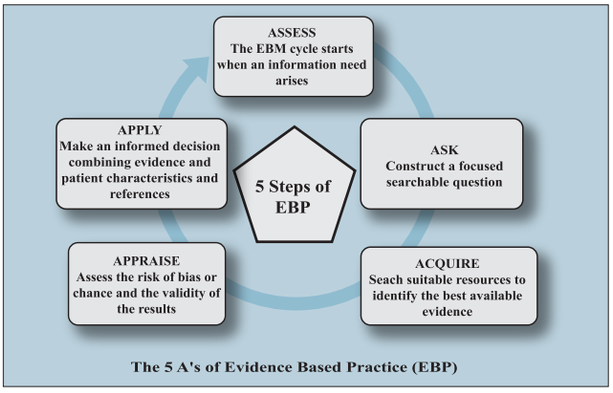
Editorial

Chattagram International Medical College Journal
Volume 11 Number 1 January 2026; 1-1

Evidence Based Medicine

Abu Shahed Muhammed Zahed[1*]

David Sackett is considered the “Father of Evidence Based Medicine (EBM)” is *described as the Conscientious, Explicit and Judicious use* of the most up-to-date evidence when making decisions about the treatment and care of individual patients.[1] The EBM cycle starts whenever a clinical question arises while providing care for a patient.



The 5 A's of Evidence Based Practice (EBP)

One of the earliest appearances of the term "Evidence-Based Medicine" in the medical literature occurred in a 1991 ACP Journal Club editorial by Dr. Gordon Guyatt.[2] This was the first of a series of articles published by Dr. Guyatt, Dr. Brian Hayes, Dr. David Sackett, Dr. Deborah Cook and other members of the Evidence-Based Medicine Working Group, which introduced and advocated for the practice of Evidence-Based Medicine (EBM). EBM proponents take pains to point out that, "Evidence is necessary but not sufficient for clinical decision making."[3] EBM practitioners must combine their clinical expertise, the best available evidence and their patient's personal characteristics and preference when making decisions.

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After being met with some initial resistance the EBM model gradually became widely accepted and practiced.[1] It is now commonly included in both undergraduate and graduate medical education curricula.[4,5] The ideas and process of EBM have subsequently been adopted in many fields, including nursing, dentistry, public health and beyond, leading to the rise of the term Evidence-Based Practice (EBP).

The Purpose of This Guide is to:

- Introduce the concepts and practical applications of Evidence-Based Medicine (EBM).
- Provide a list of library resources to help users find evidence-based answers to clinical questions, along with guidance on which resources are most suitable for different information needs.
- Recommend a range of books and online materials to support users in expanding their knowledge and understanding of EBM.

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Original Article

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Intrauterine Fetal Deaths during the COVID-19 Pandemic: A Descriptive Study from a Tertiary Hospital in Chattogram, Bangladesh

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Kohinur Nahar Chowdhury[3] Taslima Akter[3] Md. Abdullah Al Mamun[1]

Abstract

Background: The COVID-19 pandemic has had profound effects on the health of pregnant women and their fetuses, complicating maternal care globally. The pandemic significantly disrupted Antenatal Care (ANC) services, which are crucial for pregnant women. Reports suggest that COVID-19 may increase the risk of Intrauterine Fetal Death (IUFD) and other pregnancy complications. This study aimed to determine the ANC health-seeking behavior of pregnant women with IUFD, explore the causes of IUFD and identify associated maternal complications during the COVID-19 pandemic in a tertiary-level hospital in Bangladesh.

Materials and methods: A prospective observational study was conducted at the Chattogram International Medical College Hospital from January 2021 to December 2021. Women with IUFD admitted during the study period were consecutively included. Data on demographic characteristics, ANC history, causes of IUFD and associated maternal complications were collected.

Results: A total of 4,017 deliveries were studied, with 33 cases of IUFD. The incidence of IUFD was 8.21 per 1,000 deliveries. Antepartum risk factors accounted for 42.4% and intrapartum causes for 9.1% of the IUFDs. In 48.5% of cases, no specific cause was identified. The most common identifiable causes included gestational diabetes mellitus (12.1%) post-term pregnancy (9.1%) preeclampsia (6.1%) and prolonged labor (6.1%). The ANC health-seeking behavior was suboptimal for many women, with 69.7% attending regular ANC visits. The majority of women delivered vaginally (90.9%) with 45.5% requiring a hospital stay of 5 days or more.

Conclusions: Early detection and management of correctable risk factors can significantly reduce the occurrence of IUFD and related maternal complications. Optimizing antenatal care services during pandemics is essential to improve maternal and fetal health outcomes.

Key words: Antenatal care; Intrauterinefetal death; Maternal complications.

Introduction

The COVID-19 pandemic has profoundly impacted maternal and fetal health globally, disrupting healthcare services and exacerbating adverse pregnancy outcomes.[1] Intrauterine Fetal Death (IUFD) a devastating obstetric complication, has been reported at increased rates during the pandemic, particularly in Low- and Middle-Income Countries (LMICs) like Bangladesh, where healthcare access was already limited.[2,3] The World Health Organization (WHO) defines IUFD variably, with some countries using a threshold of 16 weeks gestation and others 28 weeks or a fetal weight of ≥1000 grams.[2] In Bangladesh, the incidence of IUFD was recorded at 24.3 per 1,000 births in 2019, with emerging data suggesting a rise during the pandemic.[3,4]

The etiology of IUFD is multifactorial, involving maternal, placental, fetal and umbilical cord factors.[5,6] Maternal conditions such as Hypertensive Disorders of Pregnancy (HDP) Gestational Diabetes Mellitus (GDM) and

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preeclampsia are leading contributors.[1,6] Fetal causes include Intrauterine Growth Restriction (IUGR) congenital anomalies and chromosomal abnormalities, while placental pathologies like insufficiency, previa, and infarction play critical roles.[5,7] During the pandemic, disruptions in Antenatal Care (ANC) and redistribution of medical resources to COVID-19 management further compounded these risks, leading to delayed diagnosis and management of preventable conditions.[1,8] Studies from Nepal and Bangladesh reported increased institutional stillbirths and neonatal mortality during the pandemic, attributed to reduced access to routine obstetric care rather than direct viral effects.[3,8]

Pregnant women are physiologically more vulnerable to severe infections due to immune and cardiovascular adaptations, increasing their risk of complications from COVID-19.[9,10] The virus has been linked to placental dysfunction, including chronic intervillositis, massive fibrin deposition, and vascular injury, which may lead to fetal hypoxia and demise.[7,11] Placental SARS-CoV-2 infection, though rare, has been documented in 2.8% of IUFD cases, with specific histopathological changes like villous necrosis and intervillous thrombi.[11,12] However, vertical transmission remains uncommon and fetal outcomes are more likely influenced by systemic maternal inflammation and coagulopathy.[13]

The pandemic also altered obstetric care patterns, with higher rates of Cesarean deliveries (CS) due to concerns about fetal distress and maternal health.[14,15] In Bangladesh, CS rates rose sharply during the pandemic, reflecting global trends where emergency interventions were prioritized.[16]Concurrently, ANC attendance declined, with 30% of women in some studies receiving irregular or no prenatal care, exacerbating risks for unmanaged hypertension, diabetes and infections.[3,17] Post-COVID syndrome, characterized by persistent fatigue, respiratory distress, and cognitive dysfunction, further complicated postpartum recovery and long-term maternal health.[18,19]

Despite these challenges, the direct role of COVID-19 in IUFD remains debated. While some studies reported higher stillbirth rates during the pandemic,[3,8] others found no significant increase, highlighting regional disparities in healthcare resilience.[20,21] In Chattogram, where maternal healthcare infrastructure is strained, the pandemic likely amplified pre-existing gaps in service delivery.[3] This study aims to describe the patterns and characteristics of IUFD during the COVID-19 pandemic at a tertiary hospital in Chattogram, Bangladesh, focusing on demographic, obstetric and healthcare utilization factors without inferring direct causality between SARS-CoV-2 infection and fetal demise.

Materials and methods

This prospective observational study was conducted in the Department of Obstetrics and Gynecology at Chattogram International Medical College Hospital, Bangladesh, from January to December 2021. The study aimed to evaluate the patterns and characteristics of Intrauterine Fetal Death (IUFD) during the COVID-19 pandemic, with a focus on antenatal care utilization, etiological factors and maternal outcomes.

All consecutively admitted patients diagnosed with IUFD at or beyond 28 weeks of gestation were eligible for inclusion. Cases of IUFD occurring before 28 weeks, fetuses weighing less than 1000 grams or multiple gestations were excluded to minimize confounding variables. During the study period, 33 IUFD cases were identified out of a total of 4017 deliveries, yielding an incidence rate of 8.21 IUFDs per 1000 births.

Data were collected prospectively using a structured case record form designed to capture demographic, obstetric, and clinical variables. Maternal age, residential location (Urban, rural or semi-urban) gravidity, gestational age at diagnosis, height, weight and Body Mass Index (BMI) were recorded. Antenatal Care (ANC) utilization was categorized by the number of visits (None, 2, 3, 4 or ≥5) and regularity (Regular, irregular or none). COVID-19-related variables included documented infection history (Confirmed via RT-PCR) hospitalization for COVID-19 and contact with confirmed cases within the household.

The diagnosis of IUFD was confirmed via ultrasonography, with the absence of fetal cardiac activity serving as the definitive criterion. Gestational age was determined using first-trimester ultrasound dating where available. For each case, potential causes of IUFD were systematically evaluated, including maternal conditions (e.g. Gestational diabetes mellitus,

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preeclampsia) fetal factors (e.g. Congenital anomalies, growth restriction) and placental abnormalities (e.g. Abruption, previa). Cases without an identifiable etiology after standard clinical assessment were classified as 'unexplained IUFD'. Fetal characteristics such as weight (Stratified as ≤1.5 kg, >1.5–2.5 kg or >2.5 kg) and the degree of maceration (none, mild, moderate or severe) were documented. Maternal outcomes analyzed included the mode of delivery (Vaginal or cesarean) complications (e.g. Postpartum hemorrhage, need for blood transfusion) and duration of hospitalization (Stratified as <5 or ≥5 days).

Ethical approval for the study was granted by the Institutional Review Board (IRB) of Chattogram International Medical College. Written informed consent was obtained from all participants prior to data collection and confidentiality was maintained by anonymizing patient identifiers. Data analysis was performed using descriptive statistics, with categorical variables expressed as frequencies (Percentages) and continuous variables as means (± standard deviation). Given the observational nature of the study, inferential statistics were not applied.

Results

A total of 4,017 deliveries occurred during the study period, with 33 cases of Intrauterine Fetal Death (IUFD) yielding an incidence of 8.21 IUFDs per 1,000 deliveries at Chattagram International Medical College Hospital during the one-year time period. The mean age of the women who experienced IUFD was 25.5 ± 4.9 years. Table I illustrates that the majority of the women were within the 20-29 years age group, with 48.5% residing in rural areas. More than half of the women presenting with IUFD were multigravida (54.5%), and 12.1% had a Body Mass Index (BMI) above 24.9 kg/m^2.

Table I Demographic and obstetric characteristics of the women suffering IUFDs

Characteristics	Frequency	Percentage (%)
Age		
<20 years	4	12.1
20–29 years	21	63.6
≥30 years	8	24.2
Residence		
Rural	16	48.5
Urban	13	39.4
Semi-urban	4	12.1
Gravidity		
One	15	45.5
Two	6	18.2
Three	4	12.1
Four and above	8	24.2
Gestational period		
28–32 weeks	8	24.2
33–36 weeks	9	27.3
37–40 weeks	12	36.4
>40 weeks	4	12.1
Body Mass Index (BMI) (in kgm^2)		
Underweight (<18.5)	3	9.1
Normal (18.5 – 24.9)	26	78.8
Overweight (>24.9)	4	12.1

In terms of Antenatal Care (ANC) Table II shows that all but one woman had at least one ANC visit, with the majority (69.7%) receiving regular ANC visits. About 21.2% of the women reported a history of COVID-19 infection and 9.1% required hospitalization for the infection. A notable proportion (30.3%) had a family contact with a COVID-19 infected case.

Table II Antenatal check-up pattern and COVID-19 infection of the women suffering IUFDs

Characteristics	Frequency	Percentage (%)
Pattern of ANC visit		
Regular	23	69.7
Irregular	9	27.3
None	1	3.0
Number of ANC visits		
None	1	3.0
Two visits	10	30.3
Three visits	10	30.3
Four visits	7	21.2
Five or more visits	5	15.1
History of COVID-19 infection	7	21.2
History of hospitalization for COVID-19	3	9.1
History of contact with COVID-infected case in the family	10	30.3

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The antepartum causes of IUFD were identified in 42.4% of the cases, while 9.1% of the IUFDs were attributed to intrapartum causes. 48.5% of the cases had no identifiable risk factors. Among the identifiable causes, gestational diabetes mellitus (12.1%), post-term pregnancy (9.1%) preeclampsia (6.1%) and prolonged labour (6.1%) were the most common risk factors (Table III).

Table III Different causes of IUFDs

Risk factors/ Causes	Frequency	Percentage (%)
Antepartum	14	42.4
Maternal risk factors		
Gestational diabetes mellitus	4	12.1
Preeclampsia	2	6.1
Ascending infection	1	3.0
Fetal risk factors		
Intrauterine growth retardation	1	3.0
Rh Immunization	1	3.0
Gross congenital malformation	1	3.0
Placental risk factors		
Post-term	3	9.1
Placenta Previa	1	3.0
Intrapartum	3	9.1
Prolonged labour	2	6.1
Birth trauma	1	3.0
Unexplained	16	48.5

Table IV demonstrates the fetal characteristics in IUFD cases. The majority of the fetuses had a weight between 1.5–2.5 kg (36.4%). Non-macerated fetuses made up 54.5% of the cases, while moderately macerated and severely macerated fetuses were less common, accounting for 3.0% and 6.1%, respectively. In terms of type of IUFD early IUFD was the most common (54.5%) followed by late IUFD (27.3%) and stillbirth (18.2%).

Table IV Fetal characteristics

Characteristics	Frequency	Percentage (%)
Degree of maceration		
None	18	54.5
Mild	12	36.4
Moderate	1	3.0
Severe	2	6.1
Type of IUFD		
Stillbirth	6	18.2
Early IUFD	18	54.5
Late IUFD	9	27.3
Fetal weight		
1.5 kg	11	33.3
>1.5-2.5 kg	12	36.4
>2.5 kg	10	30.3

The mode of delivery was predominantly vaginal, with 90.9% of women delivering vaginally, while 9.1% underwent a Caesarean section. Indications for Caesarean delivery included previous cesarean section and induction failure. Regarding maternal outcomes, 45.5% of women had a length of hospital stay of 5 days or more and 3.0% required a blood transfusion (Table V).

Table V Outcome of the women suffering IUFDs

Outcome parameters	Frequency	Percentage (%)
Prolonged labour	3	9.1
Blood transfusion needed	1	3.0
Mode of delivery		
Vaginal delivery	30	90.9
Cesarean section	3	9.1
Hospital stay ≥5 days	15	45.5

Discussion

This study provides critical insights into the patterns and characteristics of Intrauterine Fetal Death (IUFD) during the COVID-19 pandemic at a tertiary care center in Chattogram, Bangladesh. The observed IUFD incidence was 8.21 per 1000 births, which is considerably lower than the rate of 66.4 per 1000 reported by Yasmin et al. at a different tertiary facility in Bangladesh during the same pandemic period.[3] However, it remains below the national stillbirth rate of 18.1 per 1000 births reported in the Global Burden of Disease Study 2021.[22] This suggests variation in IUFD burden even within the country, potentially due to differences in population characteristics, care-seeking behavior or facility capacity. Internationally, the IUFD rate in our study remains higher than those reported in high-income countries (4.7–12.0 per 1000 births during pre-pandemic period).[6] While our observed IUFD rate was under the global average reported in 2021 (16 per 1000 births) it remained above the levels achieved in high-performing health systems such as Japan and South Korea, Estonia, Finland and others, where the rates were varied from 2.0 – 3.0 per 1000 births, highlighting the need for continued health system improvements.[22]

The predominance of IUFD cases among women aged 20–29 years (63.6%) and rural residents (48.5%) mirrors findings from Sharma et al. and Jamal & Agarwal, where limited ANC access in rural areas contributed to adverse outcomes.[17,23] Despite 69.7% of our cohort having regular ANC

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visits, 30.3% reported irregular or no care, consistent with KC et al. who attributed 65% of pandemic-era IUFDs in Nepal to disrupted ANC services.[8] Notably, only 21.2% of our cases had COVID-19 infections, suggesting indirect effects (e.g. Healthcare diversion) played a larger role than direct viral pathogenesis, as posited by Khalil et al.[1]

Hypertensive disorders (45.5%) and gestational diabetes (12.1%) were leading identifiable causes, paralleling global studies.[6,15] The high proportion of unexplained IUFDs (48.5%) aligns with Man et al. who reported 19–50% of cases worldwide lack definitive causes.[5] Placental pathologies, observed in 42.4% of our antepartum cases, corroborate findings of COVID-19-associated placentitis by Kato et al. though histopathological confirmation was limited in our study.[7]

The predominance of vaginal deliveries (90.9%) contrasts with increased Cesareansection rates in India during the pandemic, likely reflecting our center's protocol for uncomplicated IUFD management.[14] Prolonged hospitalization (≥5 days in 45.5%) and low transfusion needs (3.0%) were comparable to outcomes in Van Hees et al. emphasizing the relative safety of vaginal delivery even during systemic healthcare strain.[24]

While this study did not highlight the association of COVID-19, the convergence of risk factors (e.g. Hypertension, diabetes) highlights universal vulnerabilities during the pandemic. The lack of racial disparities in our cohort contrasts with Estin et al. possibly due to homogeneous demographics but reinforces that socioeconomic barriers, particularly in rural areas, worsened outcomes.[20]

Prospective design and standardized data collection strengthen internal validity. However, small sample size (n=33) and absent placental histopathology limit causal inferences about COVID-19's role. These gaps align with limitations noted in similar LMIC studies.[11]

Limitations

The single-center design and small sample size limit the generalizability of this study. The lack of detailed data on COVID-19 severity, timing during pregnancy and socioeconomic factors may have influenced outcomes. Conducting the study during a period of healthcare disruption could also have introduced bias from delays in antenatal care and fetal monitoring.

Conclusion

In conclusion, this study highlights the adverse impact of the COVID-19 pandemic on maternal and fetal outcomes, including a rise in IUFD and other complications. Disruptions in antenatal care, COVID-19 infections and related maternal conditions contributed to these findings. While a direct link to IUFD wasn't confirmed, the results stress the need for stronger maternal care, early intervention, and robust health systems to protect high-risk pregnancies during public health crises.

Recommendations

Future studies should include larger, multicenter cohorts to better assess the relationship between COVID-19 infection and IUFD. Additionally, ensuring consistent antenatal care during health crises and preparing for future pandemics is critical to improving maternal and fetal health outcomes.

Disclosure

The authors declared no conflicts of interest.

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Original Article

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Evaluating Maternal and Fetal Outcomes in Primigravida Using the Modified WHO Partograph: A Prospective Study in Chattagram

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Abstract

Background: Prolonged and obstructed labour is a significant cause of maternal and perinatal morbidity and mortality, particularly in low-resource settings. The World Health Organization (WHO) partograph is a low-cost tool designed to monitor labour progress and facilitate the early detection of complications. Despite its proven efficacy, utilization remains low in many countries. This study aimed to evaluate maternal and fetal outcomes in primigravida women monitored using the modified WHO partograph at a tertiary care facility in Bangladesh.

Materials and methods: A prospective observational study was conducted from April 2021 to October 2021 at the Department of Obstetrics and Gynaecology, Chattagram Maa-O-Shishu Hospital Medical College, Chattagram, Bangladeshamong 100 primigravida women with singleton, term pregnancies in vertex presentation. Labour was monitored using the modified WHO partograph upon admission. Data on socio-demographic characteristics, labour progression, and maternal and neonatal outcomes were collected and analyzed using SPSS version 22.

Results: The mean age of participants was 24.2 years, with a majority (76%) aged 20-25. A significant proportion (42%) were from poor socioeconomic backgrounds. Normal vaginal delivery was achieved in 76% of participants. The caesarean section rate was 24%, with the primary indications being fetal distress (37.5%) and non-progress of labour (29.2%). Maternal outcomes were positive, with 87% recovering without any complications, the most common complications (Postpartum haemorrhage, sepsis, urinary retention) occurred in only 3% of cases each. Neonatal outcomes were largely favourable: 89% of newborns had an Apgar score of ≥7 at 5 minutes and 7% required NICU admission. Reassuringly, there were no stillbirths or early neonatal deaths.

Conclusion: The use of the modified WHO partograph effectively guided labour management in primigravida, leading to timely interventions, a justified caesarean rate and excellent maternal and neonatal outcomes. Efforts to improve its implementation through training and digital solutions are recommended.

Key words: Caesarean Section; Labour Monitoring; Maternal Outcomes; Neonatal Outcomes; Partograph; Primigravida.

Introduction

Labour complications during childbirth pose a significant global health challenge, contributing to substantial maternal and perinatal morbidity and mortality, particularly in developing countries.[1-3,4,5] Approximately 8% of labouring women experience prolonged labour, increasing risks of short-term complications like infection and long-term issues such as fistulas, particularly in low-resource settings.[4,6] Safe motherhood initiatives highlight that many adverse outcomes can be prevented through cost-effective interventions like partograph monitoring, which facilitates early detection and management of labour complications.[1,2,7]

The partograph, endorsed by the World Health Organization (WHO) since 1994, is a critical, inexpensive tool for monitoring labour progress and maternal and foetal well-being.[4] The modified

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WHO partograph, implemented in 2000, monitors active labour from 4 cm cervical dilatation, using alert and action lines to guide timely interventions like amniotomy, oxytocin augmentation or caesarean section.[3,8] Research shows that partograph use significantly reduces labour duration, augmentation needs, and caesarean rates (From 44% to 21% in some settings) while improving neonatal outcomes, including lower Apgar scores, without increasing Neonatal Intensive Care Unit (NICU) admissions.[6,8] It also reduces vaginal examinations, enhancing maternal comfort and infection prevention and supports protocol-based management to alleviate pain and promote vaginal delivery.[2,7,10]

Despite its efficacy, partograph utilization remains low in low- and middle-income countries, with rates ranging from 31.1–73.3% in Ethiopia and 1.4–33.0% in Bangladesh hindered by staff shortages, inadequate training, and lack of institutional policies.[6,11-13] Incomplete documentation, with only 6.25% of partographs fully completed in some settings and critical parameters like amniotic fluid status often omitted, limits effectiveness.[14]

This study evaluates maternal and foetal outcomes in primigravida monitored by partograph in a tertiary care setting in Bangladesh, hypothesizing that its systematic use enhances labour management, reduces complications and improves delivery outcomes through early detection and intervention and reduce the rate of primary caesarean section.

Materials and methods

This prospective observational study was conducted from April to October 2021 at the Department of Obstetrics and Gynaecology, Chattagram Maa-O-Shishu Hospital Medical College, Chattagram, Bangladesh, to evaluate maternal and foetal outcomes in primigravida women monitored using the modified WHO partograph during labour. A total of 100 primigravida women with singleton pregnancies at 37 to 42 weeks gestation, admitted for labour management, were enrolled using purposive sampling. Inclusion criteria included primigravida status, spontaneous or induced labour with cervical dilatation >4 cm, singleton pregnancy, and vertex presentation. Women with medical complications (e.g. Anaemia, hypertension, diabetes) antepartum haemorrhage, breech presentation, multiple pregnancies, previous caesarean section, intrauterine death, cervical dilatation >7 cm or premature labour (<37 weeks) were excluded.

Eligible participants provided informed written consent. A detailed history was collected using a pre-structured proforma, covering socio-demographic characteristics, clinical manifestations and risk factors. Routine antenatal investigations, including complete blood count, ABO/Rh grouping, HIV/HBsAg/VDRL and obstetric ultrasonography (If required) were documented. General, systemic and obstetric examinations included per-abdominal assessment of uterine height, presentation, engagement and foetal heart rate and per-vaginal examination under aseptic conditions to evaluate cervical dilatation, effacement, foetal position, station, membrane status, liquor colour, and pelvic adequacy. The modified WHO partograph was initiated upon admission to the labour room, recording patient identification, foetal heart rate (Every 30 minutes) labour progress (Cervical dilatation and foetal head descent every 4 hours) membrane status, liquor characteristics, maternal vital signs (Pulse, blood pressure, temperature, urine output every 4 hours) and foetal skull moulding. The study protocol was approved by the Ethical Committee of Chattagram Maa-O-Shishu Hospital Medical College, ensuring data confidentiality.

Data on labour progression and outcomes were recorded in a case record form, including course of labour (Normal/abnormal) duration (Normal/prolonged >12 hours for combined first and second stages), mode of delivery (Normal vaginal, instrumental or caesarean) maternal outcomes (e.g. Postpartum haemorrhage, puerperal sepsis) and foetal outcomes (e.g. Apgar score, delayed cry). Mothers and newborns were followed until discharge to assess complications and neonatal outcomes, such as birth weight, NICU admission, stillbirth or neonatal mortality. A pre-designed questionnaire was pretested for clarity. Data were entered into SPSS version 22, cleaned, validated and analysed, with results presented as proportions in tables and visualized using Microsoft Excel. A p-value <0.05 was considered statistically significant.

Results

A total of 100 primigravida women in labour were monitored using the modified WHO partograph and constituted the study population. The findings are

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presented below, encompassing demographic characteristics, labour progression and maternal and neonatal outcomes.

The socio-demographic profile of the participants is summarized in Table 1. The mean maternal age was 24.2 years, with the majority (76%) falling within the 20-25 year age bracket. Most participants resided in urban areas (68%) and identified as housewives (58%). In terms of education, 42% had completed primary education. Socioeconomically, 42% were classified as poor, with a Gross National Income (GNI) per capita of less than 7,000 Taka.

Table I Socio-demographic Characteristics of the Study Participants (n=100)

Characteristic	Category	Frequency	Percentage (%)
Age (Years)	20-25	76	76.0
	26 – 30	18	18.0
	31 – 35	6	6.0
	Mean ± SD	*24.2 ± 5.3*	
Residence	Urban	68	68.0
	Rural	32	32.0
Education	Primary	42	42.0
	Secondary	28	28.0
	Higher than Secondary	17	17.0
	Illiterate	13	13.0
Occupation	Housewife	58	58.0
	Daily Worker	20	20.0
	Service Holder	14	14.0
	School Teacher	8	8.0
Socioeconomic	Poor (<7,000 Tk.)	42	42.0
Status	Middle (7,000-27,000 Tk.)	38	38.0
	Upper (>27,000 Tk.)	20	20.0

Key parameters of labour progression are detailed in Table II. At admission, the majority of women (83%) had experienced spontaneous onset of labour and membranes were intact in 90% of cases.

Augmentation of labour, primarily with oxytocin infusion, was required in a significant proportion of women (66%). Artificial Rupture of Membranes (ARM) was performed in 32% of cases.

The partograph was instrumental in identifying deviations from normal labour progress. In 51% of cases, the cervical dilation curve crossed the alert line, signalling slow progress. Of these, 17% of all participants crossed the action line, necessitating immediate obstetric intervention.

Table II Labour Parameters and Partograph Findings (n=100)

Parameter	Category	Frequency	Percentage (%)
Labour Onset	Spontaneous	83	83.0
	Induced	17	17.0
Membranes at	Intact	90	90.0
Admission	Ruptured	10	10.0
Augmentation	Performed	66	66.0
Partograph	Crossed Alert Line	51	51.0
Progression	Crossed Action Line	17	17.0

The mode of delivery and associated interventions are presented in Table 3. Normal Vaginal Delivery (NVD) was achieved in 76% of women. The caesarean section (LUCS) rate was 24%). The primary indications for caesarean delivery were fetal distress (37.5%) non-progress of labour (29.2%) and prolong labour (20.83%).

Maternal outcomes were largely positive, as shown in Table IV. The vast majority of women (87%) recovered in the postpartum period without any complications. The most common maternal complications each had an incidence of 3%, including Postpartum Haemorrhage (PPH) puerperal sepsis and urinary retention.

Table III Delivery Outcomes and Interventions (n=100)

Parameter	Category	Frequency	Percentage (%)
Mode of Delivery	Normal Vaginal		
	Delivery (NVD)	76	76.0
	Caesarean Section (LUCS)	24	24.0
Indication for	Fetal Distress	9	37.5
LUCS (n=24)	Failure of Induction	3	12.3
	Non-progress of Labour	7	29.2
	Prolong Labour	05	20.83

Table IV Maternal Complications and Outcomes (n=100)

Outcome	Frequency	Percentage (%)
Recovered without Complications	87	87.0
Postpartum Haemorrhage (PPH)	3	3.0
Puerperal Sepsis	3	3.0
Urinary Retention	3	3.0

Neonatal outcomes are detailed in Table V. Regarding birth weight, 52% of newborns weighed between 2.5–2.99 kg, while 18% were low birth weight (<2.5 kg).

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Assessment of immediate well-being via Apgar scores showed that at 1 minute, 83% of neonates had a score of 7–10. This improved by 5 minutes, with 89% scoring between7–10. Adverse neonatal outcomes included birth asphyxia (9%) admission to the Neonatal Intensive Care Unit (NICU) (7%) and neonatal sepsis (3%). Reassuringly, there were no stillbirths or early neonatal deaths recorded in this cohort.

Table V Neonatal Outcomes (n=100)

Outcome	Category	Frequency	Percentage (%)
Birth Weight (In kg)	<2.5	18	18.0
	2.5-2.99	52	52.0
	3.0-3.49	24	24.0
	>3.5	6	6.0
APGAR Score			
At 1 minute	7-10	83	83.0
	4-6	11	11.0
	<4	6	6.0
At 5 minutes	7-10	89	89.0
	4-6	8	8.0
	<4	3	3.0
Adverse Outcomes	Birth Asphyxia	9	9.0
	NICU Admission	7	7.0
	Neonatal Sepsis	3	3.0
	Big baby	4	4.0

Discussion

This study provides valuable insights into the labour outcomes of primigravid women monitored with the modified WHO partograph at a tertiary care facility. The mean age of the participants was 24.2 years, with the vast majority (76%) aged 20–25. This is a typical age range for first pregnancies and aligns with the demographics reported in similar studies in South Asia, such as Jain et al.

A critical function of the partograph is to signal deviations from normal labour. In this study, 51% of labours crossed the alert line and 17% crossed the action line. This rate of action line crossing is higher than the 7% reported by Jain et al.[2] This discrepancy is likely explained by our study's sociodemographic profile, the high prevalence of low socioeconomic status in our cohort is a known risk factor for dystocia and labour abnormalities, meaning the partograph was correctly identifying a genuinely higher-risk population that required closer observation.[16,18]

The caesarean section rate in our study was 24%, with fetal distress (37.5%) and non-progress of labour (29.2%) being the primary indications. This rate is higher than the 15% reported by Nalini et al. and the 10% reported by Nivedita et al.[9,6] As with the action line crossings, this is likely reflective of our patient demographic with its inherent vulnerabilities, rather than a failure of the partograph. Indeed, the partograph's role is to correctly identify these genuine cases requiring operative delivery. This is supported by Rahman et al. who demonstrated that electronic partographs could reduce caesarean rates by 6–11% by improving the accuracy of decision-making.[5]

The majority of women (87%) recovered without any maternal complications and the incidence of specific complications like postpartum haemorrhage, sepsis and urinary retention was low (3% each). This low complication rate aligns with the findings of Sun et al. Neonatal outcomes were largely reassuring. The percentage of neonates with an Apgar score <7 at 5 minutes was 11%, which improved from 17% at 1 minute. This rate is comparable to the 5.5% reported by Jain et al. and is notably better than the 13% incidence of low Apgar scores documented in groups managed without a partograph, as shown by Ahmed et al.[2,20] This supports the protective effect of partograph use on fetal well-being. Furthermore, the 7% rate of NICU admission and the absence of stillbirths or early neonatal deaths in our cohort are favourable outcomes. These results are consistent with those of Yeashmin et al. in Bangladesh, who reported excellent neonatal outcomes with structured labour management protocols.[21]

However, the fact that 18% of neonates were of low birth weight (<2.5 kg). This finding is consistent with studies linking poverty to higher rates of low birth weight and its associated risks.[16,22].

A significant finding was that 66% of women required augmentation with oxytocin. This high rate, compared to the 24% reported by Nalini et al.[9] Finally, the challenge of partograph utilization cannot be overlooked. While this study demonstrates its effectiveness, global literature consistently reports low utilization rates due to staffing shortages, inadequate training and lack of supportive policies.[10,13] The fact that all labours in this study were monitored with a partograph suggests a high level of compliance within this tertiary centre, which likely contributed to the

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positive outcomes. Scaling this success requires addressing these implementation barriers, potentially through the adoption of electronic partographs, which have been shown to significantly improve compliance and outcomes.[5,15]

Conclusion

In conclusion, the modified WHO partograph proved to be an effective tool for monitoring labour in primigravida, facilitating the early detection of abnormalities and guiding timely interventions. This resulted in a manageable caesarean section rate for clear indications, low maternal complication rates, and favourable neonatal outcomes. The higher rates of intervention observed, compared to some other studies, are likely a reflection of the specific socio-demographic risk profile of the population served rather than a weakness of the tool. The primary challenge remains the widespread implementation and consistent use of the partograph.

Recommendation

Future efforts should focus on comprehensive training programs, supportive supervision and the potential integration of digital solutions to maximize the benefits of this proven tool across all healthcare settings.

Disclosure

The authors declared no conflict of interest.

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Original Article

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Pattern of Bacterial Pathogens and Their Sensitivity Isolated from Surgical Site Infection

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Abstract

Background: Surgical site infection is a very common problem for surgeon, health care provider, drug manufacturer in a country like Bangladesh. Antibiotic resistance due to in appropriate use worsens the situation more. This study aims to detect the pattern of organism involved in surgical site infection and their sensitivity to antibiotic which needs for more appropriate empirical antibiotic therapy

Materials and methods: This observational study was conducted at Chattagram International Medical College (CIMC) for a period of one year (January to December 2020) to determine the pattern of bacterial pathogens and their sensitivity isolated from surgical site infection in this region. 100 cases attending in the department of surgery were selected on purposive convenient sampling method. Wound specimen was collected and prepared as per standard operative procedure. Data regarding demography, clinical data and laboratory results was collected after informed written consent through a motivational session. Confidentiality, freedom of withdrawn and research ethics were maintained throughout the period.

Results: From a total 100 cases 82 were cultured positive and 84 organisms was isolated. Among the Gram negative organism E.coli (34.15%) was the most common followed by Klebsiella (31.7%) and Pseudomonas (24.4%). Stap. aureus was the (12.2%) only gram positive organism found and sensitive to Amikacin (100%) and Co- trimoxazole (60%) where as mostly resistant to Ciprofloxacin (80%) and Penicillin (80%).Imipenam was found 100% sensitive for all Gram negative organism on the other hand Cefixime was found 100% resistant.

Conclusion: Antibiotic resistance is increasing among pathogens causing surgical site infection. Both Gram negative and Gram positive are now resistant to conventional antibiotics and resistance is also increasing for newer antibiotics. Rational antimicrobial use and continuing surveillance of bacterial antimicrobial sensitivity tests at local level are necessary to reduce resistant bacteria. Further multi centre studies for long duration and on bigger population are needed to reveal the actual scenario in the whole country.

Key words: Antibiotic sensitivity; Microbiological culture; Resistance; Surgical site infection.

Introduction

Surgical Site Infection (SSI) is defined as a proliferation of pathogenic microorganisms which develops in an incision site either within the skin and subcutaneous fat (Superficial) and musculofascial layers (Deep) or in an organ or cavity, if opened during surgery.[1] Among surgical patients SSI are the most common nosocomial infections.[2] Surgical Site Infection (SSI) continues to be the most common complication following surgical procedures. Internationally, the frequency of SSI is difficult to monitor because criteria for diagnosis might not be standardized.[13,4,5] SSIs account for 20% to 25% of all hospital acquired infections worldwide.[6] The magnitude of SSI varies considerably in different parts of the world. Rate of SSI in USA has been reported to be 2.6 percent.[7] The rate of HAIs is markedly higher in many developing countries.[8,9] The number of surgical patients in developing countries is also increasing but surgical care given to the patients is poor.[9] Collated data on the incidence of wound infections probably underestimate true incidence because most wound infections occur when the patient is discharged, and these infections may be treated in

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the community without hospital notification. SSIs account for a high proportion of the total number of HAIs and have a great impact on patients health care cost, morbidity and mortality worldwide.[9,10] The risk of acquiring hospital infection on hospitalized patients in relation to surgery is high, since about 77% of death of patients with hospital acquired infections was reported to be related with postoperative infections.[9] Kirkland et al calculated a relative risk of death of 2.2 attributable to SSIs, compared to matched surgical patients without infection.[3,11] HAIs are further complicated by an increasing prevalence of multidrug resistant organisms like Methicillin Resistant Staphylococcus Aureus (MRSA) Methicillin Resistant Coagulase Negative Staphylococci (MRCoNS) Vancomycin Resistant Enterococci (VRE) species, multidrug resistance Escherichia coli and Acinetobacterspp.[8,12-14] However, incorrect use of antibiotic 25 to 50% of operations.[15] Inappropriate use of broad spectrum antibiotics or prolonged course of prophylactic antibiotics, disposes all patients at even greater risk because of the development of antibiotic-resistant pathogens.[16] The battle between bacteria and their susceptibility to drugs is yet problematic among public, researchers, clinicians, and drug companies who are looking for effective drugs. In addition, SSI by resistant bacteria worsens the condition and it has become serious problem in developing countries like Bangladesh owing to poor infection prevention program, crowding hospital environment, widespread uses of antibiotics and irrational prescription of antimicrobial agents.Appropriate antimicrobial therapy is mandatory not only to improve the prognosis of patients with SSIs but also to minimize the occurrence of antibiotic-resistant organisms. Most reported studies on surgical site infections, which investigated the prevalence of microbes and their antibiotic susceptibility patterns, have been published in developed countries. By contrast, the bacteriology of Surgical Site infection in Bangladesh has not been extensively studied. The problem of infected surgical sites can only be tackled properly if all these are examined bacteriologically and feedback given to the surgeons well in time, so that they can treat these with appropriate antibiotics.[17] To use antibiotics appropriately, information on the antibiotic susceptibility of the organisms isolated from SSIs is of particular value. This study was based on simple laboratory based method for assessing pattern of bacterial pathogens involved in surgical site infection in our surgery ward at CIMCH and the sensitivity pattern of these isolated pathogens to different drugs so that we can modify our local protocol of empirical therapy.

Materials and methods

This observational study was conducted at Chattagram International Medical College for a period of one year (January to December 2020) to determine the pattern of bacterial pathogens and their sensitivity isolated from surgical site infection in this region. Study populations were the patient of surgical site infection attending in the department of surgery and 100 cases were selected on purposive convenient sampling method. Materials for microbiological evaluation will be curettage/needle aspiration/pus/swab will be taken appropriately. The clinical specimen will be cultured using standard microbiological technique. Antibiotic sensitivity testing to different antimicrobial agent will be carried out using the disc diffusion method. Main outcome variables are frequency of isolates and pattern of sensitivity.

Inclusion criteria: diagnosed case of surgical site infection admitted in Surgery dept. of CIMCH. Participants who give consent and willing to comply with the study procedure were included.

Exclusion criteria: patient who refused to be included in the study.

Results

In this study 100 patients were selected according to selection criteria using the purposive sampling method. Then according to age, sex, history, co morbidity, types of surgery, culture sensitivity report data were gathered, tabulated, analyzed, then the collected data were finalized and presented in this research paper. The individual categorizations are being given from the next as the observations and result of this study.

Table I Age and Sex distribution of the population (n= 100)

Age in years	Male (%)	Female (%)	Total (%)	p value
≤30	16	20	36	
31-50	16	26	42	
>50	10	12	22	0.795*
Total	42	58	100	
Mean	37.29	39.24	38.42	
SD	17.16	15.37	16.08	
Range	17-70	5-63		

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Table II Distribution of height, weight, BMI and Total count of WBC

	Height	Weight	BMI	TC
Mean	5.27	56.16	22.1720	10991.68
SD	0.389	13.591	5.63840	3752.473
Minimum	3.40	13	8.20	6000
Maximum	5.95	86	48.00	21000

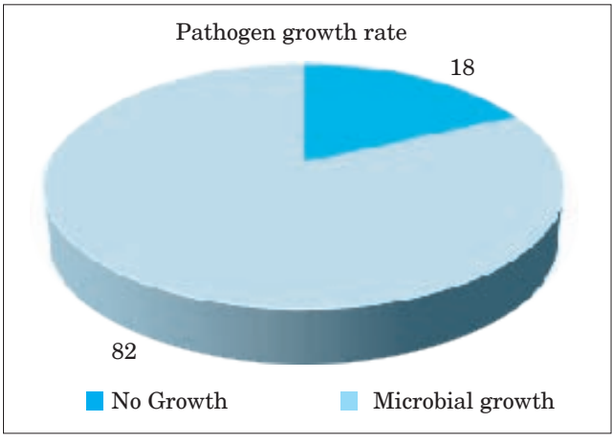

Figure 1 Microbial growth rate among the participant

Table III Distribution of patient according to different types of surgical wound (n=100)

Types of Surgical wound	Male	Female	Total	p-value
Clean	4	4	8	0.157*
Clean contaminated	12	16	28	
Contaminated	12	28	40	
Dirty	14	10	24	
Total	42	58	100	

Table IV Distribution of pathogen (n= 82)

Pathogen	n (%)
Gram positive	10(12.2%)
Staphylococcus aureus	10(12.2%)
Gram negative	74(90.25%)
E. coli	28(34.15%)
Klebsiella	26(31.70%)
Pseudomonas	20(24.40%)

Out of 100 patients of surgical site infection 82 were cultured positive and 84 organisms was isolated. Among the Gram negative organism E.coli (34.15%) was the most common followed by Klebsiella (31.7%) and Pseudomonas (24.4%). Stap. aureus was the (12.2%) only gram positive organism found. Only two sample results more than one organism.

Table V Antimicrobial sensitivity of E.coli (n= 28)

Antibiotic	Sensitive n(%)	Resistant n(%)	Intermediate n(%)
Penicillin	0	28(100%)	0
Azithromycin	0	24(85.71%)	4(14.29%)
Co-trimoxazole	16(57.14%)	8(28.58%)	2(7.14%)
Chloramphenicol	26(92.86%)	2(7.14%)	0
Ciprofloxacin	12(42.86%)	16(57.14%)	0
Ceftriaxone	2(7.14%)	24(85.71%)	0
Cefixime	0	28(100%)	0
Imipenem	28(100%)	0	0
Amikacin	24(85.71%)	2(7.14%)	2(7.14%)
Levofloxacin	12(42.86%)	10(35.71%)	4(14.29%)
Gentamicin	2(7.14%)	0	0

Table VI Antimicrobial sensitivity of Klebsiella (n= 26)

Antibiotic	Sensitive n(%)	Resistant n(%)	Intermediate n(%)
Penicillin	0	24(92.3%)	2(7.7%)
Azithromycin	2(7.7%)	20(76.92%)	4(15.38%)
Co-trimoxazole	4(15.38%)	22(84.62%)	0
Chloramphenicol	22(84.62%)	4(15.38%)	0
Ciprofloxacin	4(15.38%)	22(84.62%)	0
Ceftriaxone	2(7.7%)	20(76.92%)	0
Cefixime	0	26(100%)	0
Imipenem	26(100%)	0	0
Amikacin	24(92.3%)	2(7.7%)	0
Levofloxacin	2(7.7%)	22(84.62%)	2(7.7%)
Amoxicillin plus clavulanic acid	-	2(7.7%)	-
Cefuroxime	2(7.7%)	4(15.38%)	-
Gentamicin	2(7.7%)	4(15.38%)	-

Table VII Antimicrobial sensitivity of Pseudomonas (n= 20)

Antibiotic	Sensitive n (%)	Resistant n(%)	Intermediate n(%)
Penicillin	0	20(100%)	0
Azithromycin	0	16(80%)	4(20%)
Co-trimoxazole	6(30%)	14(70%)	0
Chloramphenicol	8(40%)	12(60%)	0
Ciprofloxacin	8(40%)	12(60%)	0
Ceftriaxone	2(10%)	18(90%)	0
Cefixime	0	20(100%)	0
Imipenem	20(100%)	0	0
Amikacin	18(90%)	2(10%)	0
Levofloxacin	8(40%)	10(50%)	2(10%)
Amoxicillin plus clavulanic acid	-	2(10%)	-
Cefuroxime	-	2(10%)	-

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Among the 74 Gram negative isolates, in case of E.coli (n=28)Imipenam was found 100% sensitive followed by Chloramphenicol (92.86%) and Amikacin (85.71%). Next sensitive was Co-trimoxazole (57.14%) Ciprofloxacin and Levofloxacin (42.86%). Penicillin and Cefixime was found most resistant (100%). Azithromycin and Ceftriaxone were found next most resistant (85.71%). Klebsiella (n=26) was found 100% sensitive for Imipenam followed by Amikacin (92.3%). Chloramphenicol (84.62%). Cefixime was found most resistant (100%). Penicillin, Ciprofloxacin and Levofloxacin were found next most resistant (84.62%). Pseudomonas (n=20) was also found 100% sensitive for Imipenam followed by Amikacin (90%) and resistant to Penicillin and Cefixime (100%).

Table VIII Antimicrobial sensitivity pattern of gram positive organism (Staphylococcus aureus, n=10)

Antibiotic	Sensitivity n (%)	Resistant n (%)	Intermediately sensitive n (%)
Penicillin	2(20%)	8(80%)	0
Azithromycin	2(20%)	4(40%)	4(40%)
Co-trimoxazole	6(60%)	4(40%)	0
Chloramphenicol	4(40%)	6(60%)	0
Ciprofloxacin	2(20%)	8(80%)	0
Ceftriaxone	4(40%)	6(60%)	0
Cefixime	4(40%)	6(60%)	0
Imipenem	8(80%)	2(20%)	0
Amikacin	10(100%)	0	0
Levofloxacin	4(40%)	4(40%)	0

Stap. aureus was the (n=10) only gram positive organism found and sensitive to Amikacin (100%) and Co- trimoxazole (60%) where as mostly resistant to Ciprofloxacin (80%) and Penicillin (80%).

Discussion

Surgical site infection is one of major causes for antimicrobial agent administration. Antibiotic was administered blindly during the first phase of treatment from n previous assumption or theoretical point of view. SSIs are increasingly becoming an institutional marker of quality assurance. These infections, representing a global threat are associated with great complications the most important ones for the patients who experience postoperative complications are increased hospital length of stay, readmission rates, mortality rates and cost of care, hospitals and payers and most importantly emergence of multi-drug resistant bacteria.[21-23]

Successful management of patients with bacterial infection depends on early identification of bacterial pathogens and selection of an effective antibiotic against the organism. Antibiotics play a major role as both the prophylaxis and treatment of infectious disease. The issue of their availability, selection, and proper use are of critical importance to the global community.[24]

In this study mean age was 38.42 with SD 16.08 and most of the patient with 31-50 years group (42%) which matched with the result of Jan et al.[25] More female developed surgical infection than male in current study (58% vs. 42% respectively). Similar higher female (52.3%) affected was found in the study of Dessie et al. although some study found higher male (60%) affected rate[26,27]. Mean (±SD) height was 5.27 (±0.39) feet, weight 56.16 (±13.59) kg, BMI was 22.17 (±5.6) and Total count of WBC was 10762 (±3752.4) respectively. Most of them were housewife (50%). Many of them was smoker (22%) 15% did regular exercise, none of them used to take alcohol, 18% had diabetes mellitus, 14/% had hypertension and 22% had anemia.

Current study found a very high rate of microbial growth in the wound site which was 82%. Higher isolation rate was reported by Mohammed et al, (83.9%).[28] Another study also found similar high level of microbial isolation (83.9%).[29] While some studies found lower rate (72.4%).[27] Most of the wounds in present study were contaminated nature (40%) minority was dirty (24%). However, the result was reverse in a study where majority of wound was dirty type (73%) and minority was contaminated (27%).[30]

Current study found that, most common was Gram negative organism (87.8%) and less was Gram positive organism (12.2%). Pradeep and Rao (2019) found 66.3% Gram negative and 33.7% Gram positive organism and E. coli (42.1%) was predominant isolate of Gram negative while Staphylococcus aureus (44.8%) was that of Gram positive.[31] Similarly, Dessie et al. found the Gram negative organism was higher (73.1%) than that of positive one (26.9%).[26]

This difference in the pattern of distribution of bacterial isolates in different setups may be due to diversity of the study population and local antimicrobial use pattern which results in the emergence of pathogens that have the potential to resist antibiotics used currently. Another reason for the predominance of Gram negative organisms may be the fact that most of the infected patients in our study had undergone abdominal surgery and Gram negatives are predominantly reported to be involved in intra-abdominal procedures.[32]

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Like other studies, most common Gram negative microbes was E. coli (34.14%) and most common Gram positive microbes was Staphylococcus aureus (12.2%) in present study. Desseie et al found E. coli (23.1%) was majority among Gram negative while Staphylococcus aureus (18.3%) among the Gram positive group.[26] A study carried out in Nepal named surgical site infection and Antibiotics use pattern in a tertiary care hospital in Nepal showed E.coli to be the most frequently isolated pathogen.[33] E. coli also found as predominant organism in a 6 month prospective surveillance conducted in the Department of General Surgery of the Rio de Janeiro University Hospital.[34]

Second most common organism was found klebsiella (31.70%) which was similar with 1 year surveillance carried out at the Department of Infectious Diseases and Research Center, Isfahan University of Medical Sciences, Isfahan, Iran.[35] Pseudomonas was found in 24.40% cases.

Similar to our study another study found more common organism to be Staphylococcus aureus (36.9%).[27] Staphylococcus aureus was 12.2% of total wound which goes with line of the result found by Akinkunmi et al. (2014) who found the organism in 18.2% of wound.[30]

Antibiotic sensitivity assessment to Staphylococcus aureus revealed 100% sensitivity to Amikacin, 80% to Imipenem (20% resistant) and 80% resistant to both Penicillin and Ciprofloxacin in current study. Low resistance to these antibiotics was also revealed in another study (17.2% to Amikacin, 7.2% to Imipenem) while high resistance to Penicillin and Ciprofloxacin (67.2%).[26, 27]

Among the Gram negative organism, E. coli revealed 100% and 87.5% sensitivity to Imipenem and Amikacin respectively in present study while high resistant to Penicillin (100%), Cefixime (100%), Ceftriaxone (92.3%) and Azithromycin (85.7%) in present study. This result corresponds with other studies. In contrast to other study while they found Chloramphenicol, Gentamicin being effective in these Gram negative rods, those drugs even highly resistant to current study.[26, 27]

Like E.coli Klebsiella and Pseudomonas found lower resistant to Amikacin and Imipenem while higher resistant to Penicillin, Azithromycin, Ceftriaxone and Co-trimoxazole in present study. Similarity was found in the result of Khorvash et al. Pradeep and Rao and Akinkunmi et al.[35,31,30] This high resistance of organisms to the most commonly used antibiotics (β-lactam antibiotics) was reported from many studies in Ethiopia.[8,24,12,36,37] Similarly, a study in Pakistan and India reported the high resistance of Acinetobacterspecies and P. aeruginosaisolated from surgical wounds.[32,38] However the resistant was higher and sensitivity was lower in current study which may be due to small sample size or the microbes become more virulent in this region.

Limitations

Sample size is very small, Duration is short, Anaerobic organisms were not studied. This is single blinded, single centered study. Does not proclaim the scenario of whole country.

Conclusion

Antibiotic resistance is increasing among pathogens causing surgical site infection. Both Gram negative and Gram positive are now resistant to conventional antibiotics and resistance is also increasing for newer antibiotics. Rational antimicrobial use and continuing surveillance of bacterial antimicrobial sensitivity tests at local level are necessary to reduce resistant bacteria. The practice of aseptic technique during and after surgery should be the primary support rather than overreliance on antibiotics to reduce antimicrobial resistance.

Recommendation

Further multi centre studies for long duration and on bigger population are needed to reveal the actual scenario in the whole country.

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Disclosure

All the authors declared no conflict of interest.

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Original Article

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Adverse Effects of Untreated Adeno-Tonsillar Hypertrophy in Children: A Tertiary Hospital Based Study in Chattogram, Bangladesh

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Abstract

Background: Adenotonsillar hypertrophy is a prevalent pediatric condition worldwide causing significant respiratory, otologic, neurocognitive and swallowing difficulties when untreated. This study evaluates the presenting symptoms, clinical and radiological evaluation of children having Enlarged Adenoid and Enlarged Tonsils to unveil how they suffer in there day to day life due to ignorance and failure of their parents to ask for treatment at right time.

Materials and methods: This cross sectional observational study, conducted at Chattagram international Medical College Hospital (CIMCH) and Evercare Hospital Chattogram (EHC) enrolled 175 children aged 1-15 years to collect cases of Enlarged Adenoids, Enlarged Tonsils or both for clinical and radiological evaluation. Data on sociodemographic profiles, clinical presentation and complications developed were documented using standardized form (CRF). Data were analyzed using descriptive statistics and inferential tests to evaluate association between symptoms and clinical/radiological findings (p< .0.05).

Results: The Cohort (Mean age 8.76 ± 3.06 years range 1-15 years) 45(25.71%) cases of Adenotonsillar Hypertrophy (ATH) showed nasal blockage 36(80%) mouth breathing 34(77.55.%) and history of recurrent attack of cold and cough 30(66.66%) most prevalent. Neurocognitive issue affected 7(15.56%) children with lack of concentration in the study, 5(11.11%) with Memory problem, 3(6.67%) with Attention Deficit and 4(8.89%) with Deterioration of school performances. Otologic symptoms of Recurrent pain in ear affected 9(20%) Hearing loss 4(8.89%) and Discharging ear 3(6.67%). 25(55.55%) children presented with adenoid facies that results from long term suffering of enlarged adenoids.

Conclusion: ATH significantly impacts the Bangladeshi children necessitating early diagnosis and tailored intervention to mitigate respiratory, otologic, neurocognitive and developmental complication. Routine screening, health education and multidisciplinary care are crucial in resource constrained settings like Bangladesh.

Key words: Adenotonsillar hypertrophy; Adenoid facies; Mouth breathing; Nasal blockage; Sleep disorder; Snoring.

Introduction

ATH represents a significant pediatric health concern with wide ranging implications on the childhood health and development. As part of the Waldeyer's ring, chain of lymphoid tissue in throat, Adenoids and Palatine tonsils serve as the first line immune defense in the upper aero digestive tract in early childhood.[1]

Their strategic location at the nasopharynx and oropharynx makes them vulnerable to pathological enlargement with hypertrophy of adenoids affecting 19-58% of children globally.[2,3] The developmental trajectory of these tissues follows a predictable pattern, with adenoids typically peaking in size between 3-7 years before undergoing natural involution.[4,5] The clinical significance of ASH stems from its potential to cause upper airway obstruction with symptom severity corelating strongly with the Adenoidal Nasopharyngeal Ratio (ANR).[6]

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The obstruction manifest most prominently as Sleep Disordered Breathing (SDB) ranging from primary snoring to Obstructive Sleep Apnea (OSA) which effects 1-5% of children.[7,8] The pathophysiology involves mechanical obstruction of the nasopharyngeal airway potentially occupying up to 90% of the nasopharyngeal space. [4] During sleep reduced muscle tone leads to repeated episode of complete or partial airway obstruction resulting in oxygen desaturation and sleep fragmentation.[9]

The consequences of untreated ATH extend across multiple organ systems. Neurocognitive effects are particularly concerning with studies demonstrating significant impairment in memory, executive function and academic performance.[10,11] Behavioral manifestation including hyper activity, aggression and attention deficit are common often mimicking ADHD.[12] At the extreme end chronic intermittent hypoxia can lead to cardiovascular complications including pulmonary hypertension and corpulmonale.[8,13]

Otologic complications represent another major disease burden. The proximity of hypertrophied adenoids to the eustachian tube orifice predisposes to Otitis Media with Effusion (OME) with affected children showing 7 fold rise of middle ear Pathology.[14] Chronic OME results in conductive hearing loss (Typically 25-40 decibels) which during critical development period can lead to speech delays and learning disabilities.[15]

The persistent cycle of infection and inflammation often necessitates multiple antibiotic courses and frequently culminates in surgical intervention. [16] The dentofacial consequences of chronic mouth breathing are profound. Altered biomechanical forces lead to characteristics “Adenoid facies” a constellation of craniofacial abnormalities including narrowing maxillary arch, retrognathic mandible and elongated facial structure.[17,18] These changes are mediated through disrupted equilibrium of orofacial muscles with continuous mouth breathing creating abnormal growth vectors.[19] After age 12 - 13 these morphological changes become irreversible potentially predisposing to adult on set obstructive sleep apnea.[20]

Emerging research highlights the role of microbial dysbiosis in ATH. Altered intestinal and nasopharyngeal microbiota may disrupt immune homeostasis creating a pro inflammatory state that perpetuates lymphoid hyperplasia.[3,21] This microbial imbalance may explain the frequent morbidity with chronic rhino-sinusitis and other inflammatory conditions.[22]

The systemic impact extends to growth parameters, children showing failure to thrive due to disrupted growth hormone secretion, increased respiratory effort and feeding difficulties.[1]

The Healthcare burden is substantial with Adenotonsillectomy being one of the most common pediatric surgical procedure worldwide.[23] In Bangladesh the tropical climate and high prevalence of respiratory tract infections may exacerbate ATH while limited healthcare access and ignorance likely delays diagnosis. This study aims to evaluate the spectrum of clinical presentation, the burden of complications across multiple organ system and the impact on quality of life in children with untreated ATH in chattogram, Bangladesh.

Materials and methods

This cross sectional observational study was conducted from September 2023 to February 2024 at the ENT Out patient department of CIMCH and EHC. Altogether 175 children were registered in the study to check the presence of symptoms suggestive of clinical diagnosis of Enlarged Adenoids, Enlarged Tonsils or both after comprehensive history taking, clinical and radiological assessment staying strictly adherent to the inclusion criteria. Exclusion criteria comprised of unwillingness to participate, definite diagnosis of enlarged Adenoids not established, cases of chronic Tonsillitis but palatine tonsils are not enlarged.

Data were collected using standardized CRF documenting sociodemographic details, detailed clinical history, ENT and Head-Neck region examination findings and lateral neck radiographic results. Key variables included Respiratory obstructive symptoms (Nasal blockage, snoring, mouth breathing, Witnessed apnea) Otologic symptoms (Otalgia, Hearing loss, Discharging ear) Infective symptoms(Chronic nasal discharge, Recurrent attack of cold) Neurocognitive symptoms (Lack of concentration, Academic performance decline) Swallowing problem (Difficulties in swallowing, Reluctant to take food)and Growth Parameters (Failure to thrive).

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Adenoid size was assessed on Lateral Neck Radiogram by Adenoid Nasopharyngeal Ratio (ANR). Mildly enlarged adenoids were not included within the main study. As they do not produce symptoms unless associated with Enlarged Tonsils. Tonsillar size was assessed using the Friedman scale. Only Tonsil size Grade III and Grade IV were taken into the study. Serum IgE level was assessed in a subset with features of nasal obstruction suggestive of nasal allergy.

Descriptive statistics were employed to summarize findings with continuous variables (e.g. Age) reported as means +/- standard deviations and categorical variables (e.g. symptom prevalence) as frequencies and percentages. Association between categorical variables (e.g. Adenoid hypertrophy and symptoms like snoring or craniofacial changes) were assessed using the Fisher's exact test, as the sample size was rather small ($p<.05$ indicating statistical significance). Data were analyzed using IBM SPSS version 22.0 with results presented in Tables and Figures to facilitate interpretation.

Verbal informed consent was obtained from the guardians of all participants. Participants had the right to withdraw at any time without impacting their care and data confidentiality was ensured. The study aimed to evaluate the adverse effects of untreated Adeno-Tonsillar Hypertrophy or focusing on incidence and sociodemographic profiles to highlight the need for timely intervention in Bangladeshi children.

Results

This study enrolled 175 children (Mean age 8.76 ± 3.06 years range 1-15 years) visiting the consultants chamber of ENT Out Patient department of Chattagram International Medical College Hospital and Evercare Hospital Chattogram from September 2023 to February 2024 with 45(25.71%) of them having ATH divided into three clinical diagnosis group Enlarged Adenoids, Enlarged Tonsils and both Adenoids and Tonsils Enlarged studied to find out their demographic and clinical characteristics. The mostly affected Age Group was seen 10-15 years (48.89%). The gender distribution was nearly equal with slight male predominance (53.3% male, 46.67% female) with 62.23% from middle socioeconomic background.

Table I Incidence of different clinical diagnosis of Adenotonsillar hypertrophy (n=45)

Variable categories	Frequency (n=45)	Percentage (%)
Enlarged Adenoids	17	37.78
Enlarged Tonsils	07	15.56
Both Adenoids and Tonsils Enlarged	21	46.66

Table I shows clinically 17(37.78%) children had isolated adenoid Hypertrophy, 7(15.56%) only Tonsillar hypertrophy and 21 (46.66%) both Adenoid & Tonsillar Hypertrophy.

Table II Demographic Characteristics of the study Participants

Variables	Categories	Frequency (n=45)	Percentage (%)
Age	Minimum age	01	
	Maximum age	15	
	Mean±SD	8.76 ± 3.06 years	
Gender	Male	24	53.33
	Female	21	46.67
Socioeconomic Status of the Patient	Low	01	2.22
	Middle income	28	62.23
	High	06	13.33
	Could not be assessed	10	22.22

Table II shows sociodemographic profile of children with AdenoTonsillar Hypertrophy

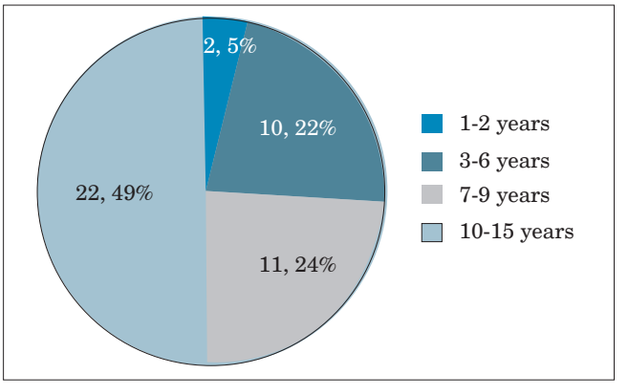

Figure 1 Age incidence of Participants (n=45):

Figure 1 shows that the most prevalent age group presented with of Adenotonsillar hypertrophy in our study region of Chattogram, Bangladesh was 10-15 years range.

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Table III Nasal obstructive symptoms of Adenotonsillar Hypertrophy

Variables	Enlarged Adenoids n (%)	Enlarged Tonsils n (%)	Both Adenoids and Tonsils Enlarged n (%)	Total n (%)
Nasal blockage	15(88.24)	05(71.43)	16(76.19)	36(80.00)
Mouth breathing	13(76.47)	02(28.57)	19(90.48)	34(75.55)
Recurrent attack of cold and cough (URTI)	09(52.94)	03(42.86)	18(85.71)	30(66.66)
Snoring	08(47.06)	01(14.28)	12(57.14)	21(46.66)
Witnessed apnoea	03(17.65)	00(0.0)	01(4.76)	04(08.88)
Restlessness during sleep	02(11.76)	01(14.28)	06(28.57)	09(20.00)

(Percentage represents the proportion in each clinical diagnosis group).

Table III shows among the nasal obstructive symptoms Nasal blockage 36(80.00) was the commonest symptom followed by mouth breathing 34(75.55) Recurrent attack of cold and cough 30(66.66) and Snoring 21(46.66) with highest prevalence in combined hypertrophy group.

Table IV Neurocognitive Effect of Adenotonsillar Hypertrophy

Variable	Enlarged Adenoids n(%)	Enlarged Tonsils n(%)	Both Adenoids and Tonsils Enlarged n(%)	Total n(%)
Lack of concentration in the study	5(29.41)	0	2(09.52)	7(15.56)
Deterioration of school performance	3(17.65)	0	1(04.76)	4(08.89)
Chronic fatigue	3(17.65)	0	2(09.52)	5(11.11)
Emotional instability	1(05.88)	1(14.28)	0	2(04.44)
Restlessness	3(17.65)	0	0	3(06.67)
Memory problem	2(11.76)	0	3(14.29)	5(11.11)
Attention deficit	1(05.88)	0	2(09.52)	3(06.67)
Learning disability	1(05.88)	0	0	1(02.22)

(Percentage represents the proportion in each clinical diagnosis group).

Table IV shows children with Enlarged Adenoids suffered from neurocognitive effect in the form of Lack of concentration in the study 7(15.56%) Deterioration of school performance 4(8.89%) Chronic fatigue 5(11.11%) Memory problem 5(11.11%) etc. More prevalent in Enlarged Adenoids group.

Table V Ear, Infective, Swallowing complications of Adenotonsillar Hypertrophy

Variable	Enlarged Adenoids n (%)	Enlarged Tonsils n (%)	Both Adenoids and Tonsils Enlarged n (%)	Total n (%)
Eustachian Tube Dysfunction (ETD) symptoms				
Recurrent pain in ear	3(17.65)	1(14.28)	5(23.81)	9(20.00)
Hearing loss	2(11.64)	0	2(09.52)	4(08.89)
Discharging ear	2(11.76)	0	1(04.76)	3(06.67)
Infective Symptoms				
Chronic nasal discharge	8(47.06)	2(28.57)	9(42.86)	19(42.22)
Chronic sore throat	3(17.65)	3(42.86)	6(28.57)	12(26.67)
Dry irritating cough	4(23.53)	1(14.28)	5(23.81)	10(22.22)
Hawking	2(11.64)	1(14.28)	5(23.81)	8(17.78)
Repeated attempt to clear the airway by blowing	5(29.41)	1(14.28)	4(19.05)	10(22.22)
Recurrent attack of lower RTI	0	0	1(04.76)	1(02.22)
Swallowing problem				
Difficulty in Swallowing	3(17.65)	2(28.57)	15(71.43)	20(44.44)
Failure to thrive	1(05.88)	0	5((23.81)	6(13.33)

(Percentage represents the proportion in each clinical diagnosis group).

Table V shows among ETD commonest symptom was Recurrent pain in ear 9(20%). Among infective symptoms it is Chronic nasal discharge 19(42.22%) and among Swallowing problem it is Difficulty in swallowing 20(44.44%). Difficulty in swallowing and failure to thrive were more observed in children with both Adenoid & Tonsil Enlarged group.

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Table V Clinical Examination findings on assessment of Nose, Size of Tonsils, Ear, Neck nodes and dentofacial structure in patients of Adeno Tonsillar Hypertrophy

Variables	Enlarged Adenoids n (%)	Enlarged Tonsils n (%)	Both Adenoid and Tonsil Enlarged n (%)	Total no (%)
Assessment of nose				
HIT pale (Allergy)	10(58.82)	1(14.28)	3(14.29)	14(31.11)
HIT not pale	1(05.88)	1(14.28)	7(33.33)	09(20.00)
DNS	3(17.65)	2(28.57)	3(14.29)	08(17.78)
Dry	1(05.88)	3(42.86)	6(28.57)	10(22.22)
Thick discharge	2(11.76)	1(14.28)	3(14.29)	06(13.33)
Thin discharge	2(11.76)	0	0	02(04.44)
Evaluation of Tonsil size				
Not enlarged	17(100)			17(37.778
Grade III		7(100)	16(76.19)	23(51.11)
Grade IV		0	5(23.81)	05(11.11)
Evaluation of neck nodes				
JD nodes enlarged	6(35.29)	5(71.43)	17(80.95)	28(62.22)
JD nodes not enlarged	10(58.82)	2(28.57)	4(19.05)	16(35.55)
Diffuse Lymphadenopathy	1(05.88)			01(02.22)
Evaluation of facial and dental structures				
Adenoid facies present	12((70.59)		13(16.90)	25(55.55)
Adenoid facies absent	5(29.41)		8(38.09)	13(28.89)
Assessment of Ear				
Normal Tm	11(64.70)	2(28.57)	14(66.67)	27(60.00)
Tm is Dull	1(05.88)			01(02.22)
Glue ear	2(11.76)		2(09.52)	04(08.89)
CSOM	1(11.76)		1(04.76)	02(04.44)
ASOM	1(11.76)		1(04.76)	02(04.44)
Impacted Wax	1(11.76)	3(42.86)	1(04.76)	05(11.11)

(Percentage represents the proportion in each clinical diagnosis group).

Table V shows Nasal allergy is the commonest sign of Enlarged Adenoids.

Table VI Investigation Findings (n=45)

Variables	Catagory	Frequency	Percentage (%)
X-ray Soft tissue Nasopharynx	Not available	14	31.11
	Mild	03	06.67
	Moderate	20	44.44
	Huge	08	17.78
Serum IgE	Not available	28	62.22
	Normal	03	06.67
	Raised	14	31.11
ASO titre	Not available	38	84.44
	Normal	03	06.67
	Raised	04	08.89

Table VI shows 31.11% children were having high level of serum IgE and 44.44% Moderately Enlarged Adenoids.

Table VII Statistical Association of Findings with clinical and Radiological variables

Finding	Distribution (%)	p-value
Degree of Airway Obstruction		
Hawking	Mild: 50.0%, Moderate: 33.3%, Severe: 20.0%, None: 0.0%	0.007
Witnessed Apneic Episodes (OSA)	Moderate: 26.7%, Severe: 20.0%, Mild/None: 0.0%	0.046
Clinical Diagnosis		
Mouth Breathing	T&A: 90.5%, Adenoid: 88.2%, Tonsil: 14.3%	0.000
Difficulty Swallowing	T&A: 71.4%, Adenoid: 17.6%, Tonsil: 28.6%	0.002
Nasal Allergy (Pale Turbinates)	Adenoid: 58.8%, T&A: 19.0%, Tonsil: 14.3%	0.017
Jugulodigastric Lymph Nodes Enlarged	T&A: 81.0%, Tonsil: 71.4%, Adenoid: 35.3%	0.027
X-ray Adenoid Grading		
Degree of Airway Obstruction	Huge Severe: 71.4%; Moderate Moderate: 63.2%; Normal None: 80.0%	0.000
Sex of the Patient		
Degree of Airway Obstruction	Male: Mild 25.0%, Moderate 37.5%, Severe 4.2%, None 33.3% Female: Mild 0.0%, Moderate 28.6%, Severe 19.0%, None 52.4%	0.029
Clinical Diagnosis	Male: Tonsil 8.3%, Adenoid 54.2%, T&A 37.5% Female: Tonsil 23.8%, Adenoid 19.0%, T&A 57.1%	0.038

T and A: Tonsil and Adenoid.

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This study identified significant associations between airway obstruction severity, clinical diagnosis, X-ray adenoid grading and sex in 45 patients. Hawking was more common in mild (50.0%) and moderate (33.3%) obstruction than severe (20.0%) or none (0.0%) and apneic episodes (OSA) occurred in moderate (26.7%) and severe (20.0%) obstruction ($p<0.05$). Mouth breathing was most prevalent in T and A (Tonsil and Adenoid) (90.5%) and adenoid enlargement (88.2%) difficulty swallowing in T&A (71.4%) and nasal allergy in adenoid cases (58.8%) ($p<0.05$). Jugulodigastric lymph node enlargement was highest in T and A (81.0%) and tonsil cases (71.4%) ($p=0.027$). X-ray grading strongly predicted obstruction severity ($p=0.000$) with huge enlargement tied to severe obstruction (71.4%) and moderate to moderate obstruction (63.2%). Males showed more mild/moderate obstruction and adenoid-only diagnosis, while females had more severe/no obstruction and T and A ($p<0.05$).

Discussion

This study of 45 children with ATH in a Bangladeshi pediatric Cohort elucidates the clinical presentation and diagnostic pattern for this prevalent condition mainly through their clinical course and partly through some investigations that could not be done in every cases and often is not possible in a cross sectional study. Our findings align with global research highlighting its impact on respiratory, otologic and craniofacial outcomes, while reflecting the realities of healthcare in a resource -limited setting.

The prevalence of Adeno Tonsillar Hypertrophy in children in our study was 25.71% which rightly coincides with the information conveyed by Major MP, Saltaji H et al. in one of their study on Enlarged Adenids where estimated prevalence is shown 19-58%in children between 6 months to 15 years old.[25]

Our cohort with a mean age of 8.76 ± 3.06 years range 1-15 years, 53.33% male and 62.23% from middle class backgrounds, Mirrors the socio-demographic pattern reported by Ohuchi et al who reported slightly more male predominance (54.9%) in the occurrence of Adenoid Hypertrophy.[2] Jyothirmai et al also noted a male predominance (58%) and peak prevalence at 6-8 years.[24] Huang at al also observed higher ATH in children aged 6-9 years ($p< .001$)[18] Maximum hypertrophy of lymphoid tissue of throat is observed in early childhood between 3-7 years age. Both of the studies have rightly shown that. However in our study the highest incidence is seen in 10-15 years range. Which is due to failure of the parents of these children to approach the right health personnel at right time. Matches with their middle income setting and ignorance due to lack of proper health educational.

Nasal obstructive symptoms dominated with nasal blockage (80%) followed by Mouth breathing (75.55%) recurrent attack of cold and cough (66.66%) and snoring (46.66%) most prevalent in combined hypertrophy cases (76.19%, 90.48%, 85.71%, 57.14%). These align with Fageeh YA, who reported snoring (82.6%) and mouth breathing (73.4%) as the most prevalent symptoms of Adenotonsillar Hypertrophy.[9] And Kurt et al. who linked snoring (47% in severe cases) restlessness during sleep, noisy breathing, recurrent throat infections, and recurrent attack of cold to adenoid Hypertrophy.[23] A study in general pediatric OPD of BIRDEM General Hospital -2 with Adenoid Hypertrophy in children by by Amrita et al. shows most common nasal obstructive symptoms in children with Adenoid Hypertrophy is mouth breathing (90.5%) followed by nasal blockage (83.6%) nasal discharge due to nasal cold (73%) and Snoring (61.8%) which exactly matches with our study.[26] In the study of Ohuchi et al in Enugu, Nigeria symptoms of nasal obstruction were the commonest presenting feature in children with Adenoid Hypertrophy , who presented mainly with noisy breathing (94.1%) mouth-breathing (70.6%) and sleep-disordered breathing (70.6%). Other features of nasal obstruction, such as an open-mouth posture, restlessness during sleep and audible breath sounds, difficulty in breathing were seen in more than 50% of the study population.[2] Witnessed apnea (17.65%) is seen mostly in Enlarged Adenoid cases more indicative of OSAS in comparison to snoring only and should be investigated by sleep study not popularized to practice among the children in Bangladesh. Recurrent attack of URTI affected 66.66% of patients particularly those with combined Hypertrophy 85.71%, consistent with Shen et al. who represents an Odds ratio of 1.395 per infection.[27]

Obstruction of the Eustachian tube was uncommon in the study of Ohuchi as only 5.9% of their

patients presented with otalgic symptoms which coincides with our study with comparatively much less recurrent pain in ear due to Eustachian Tube Dysfunction 17.65% in clinical diagnosis group of Enlarged Adenoids in contrary to Nasal obstructive features.[2] Complaints of Hearing loss with clinical evidence (10.52%) of a dull retracted or featureless TM was seen mainly in patients with Clinical diagnosis of Enlarged Adenoids or both Adenoids and Tonsils Enlarged groups. Definitely this figure would be more if Audiometric evaluation of total study population could be done which is possible in studies with grant only in a resource poor set up like Bangladesh. However this otologic issues align with Sarker et. al. who found a 20% prevalence of Otitis Media With Effusion in Bangladesh Children, Rising to 50% in Hugely Enlarged Adenoids ($p<0.05$).[14] These findings highlight the importance of regular ear examination in children with Enlarged Adenoids to prevent hearing loss.

Craniofacial changes popularly known as Adenoid facies comprised of one or more facial features eg. dull expression less look, Fading of nasolabial furrow, Open mouth posture, Retracted upper lip, Prominent upper incisor teeth, Maxillary hypoplasia, Pinched nose, High arched palate, Overcrowding of upper Jaw teeth, Long facial profile etc.is seen in 55.55% cases due to Enlarged Adenoids with severe obstruction of nasopharyngeal airway. Eslami et al. reported similar Mandibular retrusion and Liu et al. noted narrow upper arches in OSA cases ($p<0.0001$).[28,3] These alterations common in Bangladeshi Children with chronic nasal 0bstruction, suggest early ENT and orthodontic referrals to mitigate long term malocclusion.

Neurocognitive issues such as Lack of concentration in the study,deterioration of school performance, chronic fatigue, emotional instability, restlessness (29.41%, 17.65%, 17.65%, 5.88%, 17.65%) were noted primarily in enlarged adenoid cases, consistent with Niedzielski et al. who linked Adenoid Hypertrophy to cognitive deficits via sleep disruption.[20] These findings stress the importance of addressing airway obstruction to prevent deterioration of academic performances.

Diagnostic imaging via X-ray revealed moderate Adenoid Hypertrophy in 44.44% cases aligning with Jyothirmal et al. (51.7% Grade III).[24] In a study conducted by Shen et al. Elevated Serum level is seen in 60.9% cases which is not consistent with our study (31.11%). As in our study it was done only in clinically positive cases of nasal atopy; a proved reason of Enlarged Adenoids.[27]

Our findings advocate for comprehensive evaluation and tailored management of Adeno-tonsillar Hypertrophy in Bangladeshi Children. Limitation include the absence of polysomnography and reliance on X-ray over Endoscopy. Future research should explore long term outcomes and advanced diagnostics like endoscopy to enhance care. Early intervention and multidisciplinary collaboration are essential to address the diverse sequalae of this condition.

Conclusion

This study in Chattogram, Bangladesh, demonstrates the significant respiratory, otologic and neurocognitive complications of untreated ADH. Early diagnosis is essential to guide timely intervention medical or surgical. These tailored approaches are critical to prevent long term developmental impacts in resource limited settings.

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Disclosure

The authors declared no conflicts of interest.

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Original Article

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Study on Outcome of Mother and Baby in Emergency Cesarean Section

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Abstract

Background: An emergency Cesarean Section (CS) is a surgical delivery performed when there is an imminent threat to the mother or baby, requiring rapid intervention within 30 minutes. Cesarean section is one of the modes of abdominal procedure and is indicated, most commonly performed abdominal surgeries in obstetrics. Timely CS can save lives, while delayed CS increases maternal and fetal risks. Emergency CS often results in more adverse outcomes compared to elective CS. This study aimed to assess maternal and neonatal outcomes following emergency CS to provide valuable information for better management.

Materials and methods: This hospital-based Prospective observational study was conducted in the Department of Obstetrics and Gynecology, BBMH, USTC, from January to June 2013. Out of 130 enrolled cases, 110 cases were included. Written informed consent was obtained. Perioperative and postoperative maternal and neonatal complications were recorded using a structured questionnaire.

Results: Mean age of the respondents was (25.4 ± 4.9yrs), and 60% were multiparas. The majority were housewives (54%). The most common indications for emergency CS were fetal distress (32.7%) previous CS with scar (15.5%) and malpresentation (16.4%). Maternal outcomes: satisfactory (67.3%) wound infection (18.2%) PPH (5.5%) postpartum eclampsia (4.5%) puerperal sepsis (3.6%) burst abdomen (0.9%). Neonatal outcomes: Good (51.8%) asphyxia (14.5%) prematurity (13.6%) jaundice (10.9%), neonatal sepsis (3.6%) neonatal death (3.6%), stillbirth (1.8%).

Conclusion: This study demonstrates that emergency CS is a critical life-saving intervention for both mother and baby. Early diagnosis, timely intervention, and vigilant perioperative care are essential to minimize maternal and neonatal complications.

Key words: Emergency LSCS; Lower Segment Cesarean Section (LSCS); Maternal Mortality; Neonatal Mortality; Postpartum Hemorrhage (PPH); Stillbirth (SB).

Introduction

Vaginal delivery is the natural and physiological route of childbirth, however, Cesarean Section (CS) is required when maternal or fetal health is at risk. CS is indicated in conditions such as prolonged labour, fetal distress, cord prolapse, hypertensive disorders, failed induction, and failed instrumental delivery.[1] Other indications include abnormal presentation, placenta praevia, placental abruption, macrosomia, and previous 2 or more C/S.[2]

The first modern CS was performed in 1881, and surgical techniques have improved significantly since then.[3] Currently, the lower uterine segment CS is preferred because it reduces blood loss, facilitates healing, and minimizes postoperative complications compared to classical incision.[4] Depending on urgency, CS may be classified as emergency, urgent, scheduled, or elective.[5] Emergency CS is performed when there is an immediate threat to maternal or fetal life, while elective CS is planned in the absence of acute complications.[6]

Despite advances in obstetric care, CS carries risks including wound infection, hemorrhage, thromboembolism, anesthesia-related complications and

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prolonged recovery.[7] Preterm neonates delivered before 37 weeks experience higher rates of respiratory distress, hypoglycemia, jaundice and require NICU admission more frequently than term infants.[8] Maternal and neonatal outcomes can be influenced by age, parity, gestational age, and pre-existing medical conditions.[9]

In Bangladesh, rising utilization of hospital-based deliveries, especially in the private sector, has contributed to an increase in CS rates.[10,11] Although CS can be life-saving, there is limited data on maternal and neonatal outcomes following emergency CS, particularly in resource-limited settings.[12,13] Understanding indications, complications and outcomes of emergency CS is critical for optimizing care and guiding policy.[14]

This study was conducted to evaluate maternal and neonatal outcomes following emergency CS at a private medical college hospital. Objectives included identifying common indications, analyzing maternal and neonatal complications, and comparing outcomes with national and international data to inform evidence-based obstetric practice.[15]

Materials and methods

This hospital-based descriptive cross-sectional study was conducted at Bangabandhu Memorial Hospital (BBMH) University of Science and Technology, Chattogram (USTC) from January to June 2013. A total of 110 patients undergoing emergency CS were included from an initial 130 clinically suspected cases. Inclusion criteria: Gestational age 32–41 weeks, maternal age 18–35 years, any gravida and willingness to participate. Data were collected using a structured questionnaire covering sociodemographic characteristics, clinical presentation, perioperative details, and maternal and neonatal outcomes. All cesarean procedures were performed following standard obstetric protocols, and maternal and neonatal complications were recorded until discharge. Ethical approval was obtained from the hospital review board and written informed consent was secured from all participants.

Results

Table I Age of study Population (n=110)

SL	Age	Frequency	Percentage (%)	Mean ± SD
1	18–20	36	31.3%	25.4 ± 4.9
2	21–23	15	13.0%	
3	24–26	31	27.0%	
4	27–29	11	9.6%	
5	30–32	16	13.9%	
6	33–35	6	5.2%	
		Total: 110	100%	

The mean age of the study participants was 25.4 ± 4.9 years, with the majority (31.3%) in the 18–20 years age group.

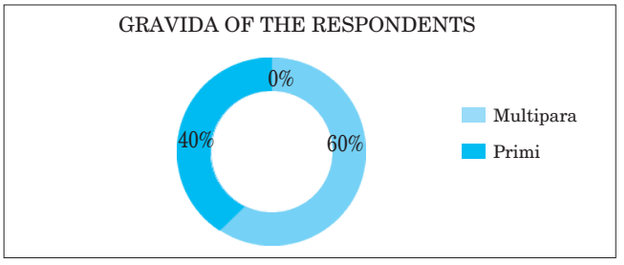

Figure 1 parity distribution among study participants. The chart demonstrates that 60% of the mothers were multiparas, while 40% were primiparas.

Table II Indication of Emergency CS (n=110)

SL	Indication	Number of Patients	Percentage (%)
i)	Fetal Distress	36	32.7
ii)	Malpresentation	18	16.4
iii)	Prolonged Labor	15	13.6
iv)	Severe Oligohydramnios	16	14.5
v)	Previous CS with Scar	17	15.5
vi)	Placenta Previa	4	3.7
vii)	Abruptio Placenta	4	3.6
		Total: 110	100

Fetal distress was the leading indication for emergency cesarean section, accounting for 32.7% of cases.

Table III Maternal Outcome Following Emergency CS (n=110)

SL	Outcome	Number of Patients	Percentage (%)
i)	Satisfactory	74	67.3
ii)	Wound Infection/Discharge	20	18.2
iii)	Postpartum Hemorrhage (PPH)	6	5.5
iv)	Postpartum Eclampsia (PPE)	5	4.5
v)	Puerperal Sepsis	4	3.6
v)	Burst Abdomen	1	0.9
		Total: 110	100%

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Among the 110 patients, most (67.3%) recovered without any complication following emergency caesarean section. Wound infection or discharge was the most common complication, occurring in 18.2% of cases.

Table IV Neonatal Outcome Following Emergency CS

SL	Outcome	Number of Babies	Percentage (%)
i)	Satisfactory	57	52.0
ii)	Asphyxia	16	14.5
iii)	Prematurity	15	13.6
iv)	Jaundice	12	10.9
v)	Neonatal Sepsis	4	3.6
vi)	Neonatal Death (NND)	4	3.6
vii)	Stillbirth (SB)	2	1.8
		Total:110	100

Among the 110 neonates delivered by emergency cesarean section, the majority (51.8%) had a good outcome. Asphyxia occurred in 14.5% of cases, prematurity in 13.6% and jaundice in 10.9%.

Discussion

This study evaluated maternal and neonatal outcomes following emergency CS in 110 patients. The findings were analyzed by maternal age, parity, indications for surgery and perioperative outcomes and compared with previous studies.

The mean maternal age was 25.4 ± 4.9 years, with the largest proportion (31.3%) aged 18–20 years. This aligns with Saha and Chowdhury and Ibrahim Med Coll J, who reported emergency CS is common among younger mothers in Bangladesh.[16,15] Studies from developed countries show a higher mean maternal age (28–32 years) reflecting delayed childbearing trends. Sixty percent of patients were multiparas and 40% primiparas. This matches National Institute of Population Research and Training data showing multiparous women frequently require emergency CS due to prior uterine scars or malpresentation.[17,18] Some studies report higher primipara proportions, reflecting local variations in obstetric care.[3]

Fetal distress was the leading indication (32.7%), followed by previous CS scar (15.5%), severe oligohydramnios (14.5%) malpresentation (16.4%) and prolonged labor (13.6%). These findings are consistent with Dutta & Konar and Saha & Chowdhury.[1,16] South Asian studies report prolonged labor as the primary indication, likely due to labor monitoring and intervention differences.[19] Placenta previa and abruptio placenta were less frequent (3.6% each) consistent with global literature.[7] Good maternal outcomes occurred in 67.3% of cases. Wound infection was the most common complication (18.2%) followed by PPH (5.5%) postpartum eclampsia (4.5%) and burst abdomen (0.9%). These results are comparable to Dewhurst's Textbook and WebMD.[6,8] The somewhat higher complication rates compared to high-resource settings may be attributed to variations in perioperative care and infection control practices.[9]

Among 110 neonates, 51.8% had a good outcome. Asphyxia occurred in 14.5%, prematurity in 13.6%, jaundice in 10.9%, neonatal sepsis in 3.6%, neonatal death in 3.6% and stillbirth in 1.8%. These results align with international studies, showing higher morbidity among neonates delivered by emergency CS, especially preterm or compromised fetuses.[3,5] Slightly lower asphyxia rates compared to regional studies may reflect timely interventions.[17] Younger maternal age and multiparity significantly contributed to emergency CS. Fetal distress and previous CS scar remained the predominant indications. Maternal outcomes were generally favorable, but wound infection remains the main complication. Neonatal outcomes demonstrate the vulnerability of infants, particularly preterm and compromised neonates, emphasizing the importance of prompt neonatal care and NICU support. Findings are largely consistent with national studies.[15-18]

Limitations

Single-center study with a relatively small sample size over six months, results may not reflect the national scenario.

Conclusion

Emergency CS is a critical life-saving intervention for both mother and fetus. Timely surgery, proper perioperative care, and early recognition of complications are essential to reduce maternal and neonatal morbidity and mortality. Most patients recovered well, though vigilance for maternal and neonatal complications remains necessary.

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Recommendations

- Antenatal risk assessment and patient education
- Timely referral to equipped facilities
- Strengthening emergency obstetric care and rapid-response training.

Disclosure

The author declared no conflicts of interest.

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Original Article

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Association of Hyperprolactinemia with HepaticEncephalopathy in Patients with Liver Cirrhosis: A Cross-sectional Study in a Tertiary Care Hospital of Bangladesh

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Abstract

Background: Hyperprolactinemia is a frequent endocrine disorder with well-known harmful effects on the reproductive system and bone metabolism. Studies have shown that raised prolactin levels in patients of chronic liver disease with encephalopathy lead to an alteration in the type of amino acids entering the central nervous system. As the incidence of liver cirrhosis increases, especially in Asian countries, this study aimed to find out the association of raised prolactin level with hepatic encephalopathy in patients with liver cirrhosis.

Materials and methods: A cross-sectional comparative study during the period from July 2023 to June 2024 was conducted in the Department of Biochemistry of Chittagong Medical College and with the collaboration of the Department of Medicine, Department of Gastroenterology and Department of Hepatology at Chittagong Medical College Hospital by non-probability purposive sampling. Sixty (60) patients of liver cirrhosis with encephalopathy and Sixty (60) patients of liver cirrhosis without encephalopathy were investigated. Analytical statistics were used to present the study findings and all analyses were performed using SPSS version 26.0.

Results: A total of 120 patients were analyzed in this study. The mean age was found to be (56.57±12.33) years in liver cirrhosis with encephalopathy and (49.12±16.3) years in liver cirrhosis without encephalopathy. There was a significant mean prolactin difference (p value 0.002) between cirrhosis with encephalopathy and cirrhosis without encephalopathy. Out of 120 patients in this study 64(53.3%) of them had serum prolactin elevated above 15 ng/ml which was significantly associated with liver cirrhosis with encephalopathy (p = 0.028).

Conclusion: It has been recommended that prolactin might play a part in the endocrine changes of chronic liver disease including cirrhosis. There has been debate as to whether raised concentrations of this hormone may be related to the complications of liver cirrhosis

Key word: Encephalopathy; Liver cirrhosis; Serum prolactin level.

Introduction

Cirrhosis of the liver is the source of several endocrine system abnormalities. It is now understood that the pathophysiology including altered secretion and feedback pathways explains the disruption of hormone action in liver cirrhosis.[1] Prolactin secretion is mainly regulated by hypothalamic inhibition through dopamine and the stimulatory influences of hypothalamic-releasing factors and circulating estrogens. Circulating estrogens are elevated in liver cirrhosis due to increased peripheral aromatization of testosterone via androstenedione and to a lesser extent through a decreased elimination by the liver.[2] Normally prolactin is associated with characteristic nocturnal rise and a characteristic circadian rhythm. Loss of circadian rhythm is characteristic of cirrhotic patients.[3] Prolactin is elevated mainly due to the drop in dopamine levels in the tuberoinfundibular tract.[4] Chronic liver disease has also been suggested to cause hyperprolactinemia for a long time.[1]

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Baker D et al. found that prolactin levels were unexpectedly high in patients with chronic liver disease.[5] Increased estrogen levels have been suggested to contribute to hyperprolactinemia.[6] However, Seehofer D et al. found that prolactin levels were independent of the aetiology of liver disease.[7]

It has been reported that hyperprolactinemia is common in liver cirrhosis.[6] While its effects on lactation and reproductive function have widely been investigated, newer studies have also suggested that there are several autocrine or paracrine actions produced locally by prolactin.[8] The prolactin receptor is expressed in a variety of organs and cells including lymphoid cells, the endometrium, the prostate and adipocytes.[9] Prolactin has been shown to accelerate liver regeneration in rodents.[10] Other research has found that the expression and location of prolactin receptors change between cirrhotic, fibrotic and healthy livers in rats and humans.[11,12] Encephalopathy commonly arises in the advanced stages of liver cirrhosis. Encephalopathy refers to a diffuse brain disorder that disrupts its function or structure. It is a frequent condition that may present as coma, delirium, acute confusional state, or dementia. The key clinical hallmark is a disturbed mental state.[13] Ammonia contributes significantly to the pathogenesis of Hepatic Encephalopathy (HE) in cirrhosis. Both basic and clinical investigations have shown that systemic inflammation potentiates the neurological consequences of hyperammonemia by compromising the blood–brain barrier and stimulating astrocytic and microglial responses. These mechanisms aggravate neuroinflammation and brain swelling, worsening mental status. The synergistic interplay of hyperammonemia and systemic inflammation constitutes a pivotal mechanism in HE pathogenesis.[14-16] There is a significant correlation between serum prolactin levels and the degree of CLD severity.[17]

The several evidences highlight hepatic involvement of prolactin and provides a new interpretation of hyperprolactinemia in advanced stages of liver disease.Thus, this present study was aimed to investigate the potential association of elevated prolactin level with hepatic encephalopathy in cirrhotic liver patients.

Materials and methods

This was a cross-sectional analytical study conducted over a period of one year (July 2023 to June 2024) in the Department of Biochemistry, Department of Medicine, Department of Gastroenterology and Department of Hepatology, Chittagong Medical College Hospital, Chattogram.

A total number of 120 subjects were purposively recruited in the study irrespective of age, race, religion and socioeconomic status. 60 subjects of diagnosed case of Liver Cirrhosis with Encephalopathy were taken as case and another 60 subjects of Liver Cirrhosis without Encephalopathy were taken as comparison group. Patients presented with liver cirrhosis with or without encephalopathy and among them who gave informed consent were included in the study while patients having those criteria but had a history of hypothyroidism, malignancy, chronic renal failure, and those who are on neuroleptics, metoclopramide, methyl dopa, reserpine, and cyproterone acetate medication therapy were excluded from the study.

Subjects were recruited from the Departments of Medicine, Hepatology, and Gastroenterology of Chittagong Medical College Hospital (CMCH). Patients with a clinical history of liver cirrhosis were initially screened, and preliminary selection was carried out. An equal number of patients with hepatic encephalopathy and without encephalopathy were then included using purposive sampling. Diagnosed cases of liver cirrhosis, both with and without encephalopathy, were enrolled after obtaining informed written consent. For each participant, serum prolactin, albumin, bilirubin, prothrombin time, and INR were measured, along with documentation of age and sex as study variables.

All the data were compiled into master sheet, processed and analyzed using IBMSPSS (Statistical Package for Social Science) 26.0 for Windows. p-value < 0.05 was considered to be statistically significant. p value <0.01 was considered highly significant. A descriptive statistic was used in summarizing baseline characteristics. The continuous variables including age, serum prolactin, bilirubin, albumin, and prothrombin time were reported as mean ± Standard Deviation (SD) Standard Error of Mean (SEM) median and range as suitable. Categorical variables were compared using chi-squared test and between the patients of liver cirrhosis with and without encephalopathy

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independent sample t-test was used to compare the difference in value of continuous variables. The Chi-square test (χ^2 test) was used to analyze the associations among categorical variables.

Ethical approval was obtained from the Institutional Review Board of Chittagong Medical College. Informed written consent was obtained from all participants after explaining the aim, procedure and potential benefits of the study in the local language.

Results

The mean age of patient of liver cirrhosis with encephalopathy was 56.57 years and mean age of liver cirrhosis without encephalopathy was 49.12 years. The minimum and maximum age was 30 and 82 respectively in liver cirrhosis with encephalopathy and in liver cirrhosis without encephalopathy, it was 15 and 93 respectively. (Table I).

Table I Age distribution among the study population (n=120)

Variable		Patient of liver cirrhosis with encephalopathy (n=60)	Patient of liver cirrhosis without encephalopathy (n=60)
Age (years)	[mean ± SD]	56.57±12.33	49.12±16.3
	Range	30-82	15-93

Figure I demonstrated that, among the study population 35(58.3%) were male in Liver Cirrhosis with encephalopathy and 25(41.7%) were female in Liver Cirrhosis with encephalopathy. In Liver Cirrhosis without encephalopathy 32(53.3%) were male and 28(46.7%) were female.

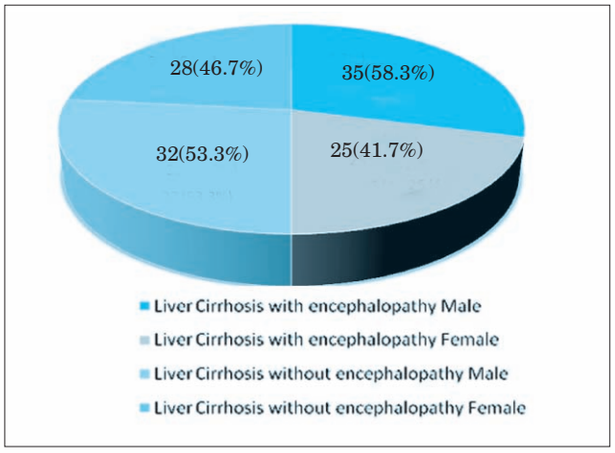

Figure 1 Gender distribution among the study population

Table II showed that, there was a significant (p 0.002, <0.05*) mean prolactin difference between liver cirrhosis with encephalopathy (41.14 ± 6.34) and liver cirrhosis without encephalopathy (19.82 ± 2.49). There was a significant mean difference between mean serum albumin and prothrombin time between liver cirrhosis with encephalopathy (2.22 g/dl) & (19.82 sec) and liver cirrhosis without encephalopathy (2.54 g/dl) and (17.40 sec) respectively.

Table II Comparison of Biochemical Markers between Patients with Liver Cirrhosis with and without Encephalopathy

Biochemical Marker		liver cirrhosis with encephalopathy	liver cirrhosis without encephalopathy	p-value
Serum Prolactin (ng/ml)	Mean ±SEM	41.14 ± 6.34	19.82 ± 2.49	0.002, <0.05*
Serum bilirubin (mg/dl)	Mean ±SEM	4.33±5.70	5.33±6.66	0.3, >0.05
Serum albumin (g/dl)	Mean ±SEM	2.22±0.71	2.54±0.77	0.017, <0.05
Prothrombin time (sec)	Mean ±SEM	19.82±6.45	17.40±5.94	0.035, <0.05

* Independent sample t-test significant at < 0.05.

In this study, it was found that the minimum prolactin level was 5.23 ng/ml and the maximum was 250 ng/ml. Table III demonstrated that, increasedprolactin level was significantlyassociated with liver cirrhosis with encephalopathy.

Table III Association of increased prolactin with liver cirrhosis with encephalopathy

Prolactin (ng/ml)	Liver cirrhosis with encephalopathy	Liver cirrhosis without encephalopathy	Total	p value
Normal level (≤15)	22	34	56	0.028,
Increased (>15)	38	26	64	<0.05*
Total	60	60		

Discussion

The present study was intended to predict the association of hyperprolactinemia with encephalopathic liver cirrhosis. Total 120 patients enlisted for the study. The mean age of liver cirrhosis with and without encephalopathy were 56.57±12.33 and 49.12±16.3 respectively, which is similar to another study done in India where mean

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age of cirrhotic patient with or without minimal encephalopathy were 50.48 and 48.1 years respectively.[18] Among cirrhotic patients with encephalopathy, 58.3% were male and 41.7% female, while in those without encephalopathy, 53.3% were male and 46.7% female. Hepatic encephalopathy predominant among male found in a study in Nepal.[19] The study reported prolactin levels ranging from 5.23 ng/ml to 250 ng/ml. Kamath SD et al found prolactin level ranging from 16 to 52 ng/mL in patients with chronic liver disease.[20] There was a significant mean prolactin difference between liver cirrhosis with encephalopathy and liver cirrhosis without encephalopathy. Similar finding was observed in a study of Giri R et al. where mean serum prolactin was significantly higher in those with encephalopathy (73.63 ± 43.85 ng/ml) than in those without (21.48 ± 2.43 ng/ml, $p<0.001$).[21] Serum albumin (2.22 vs 2.54 g/dl) was reduced and prothrombin time (19.82 vs 17.40 sec) prolonged in cirrhotic with encephalopathy compared to those without encephalopathy in the present study. In a large retrospective cohort, reduced serum albumin emerged as an independent risk factor for overt hepatic encephalopathy in cirrhotic patients, as levels were markedly lower among those who developed HE during hospitalization. Prolonged prothrombin time further indicated progressive deterioration of liver synthetic function.[22]

Limitation

There were various limitations on this investigation. First, the results might have been limited by the brief study period. Second, because of financial limitations and the uncooperative behavior of hazardous patients and their companions, the sample size was somewhat small. Lastly, because just one hospital was used for the study, the findings might not apply for whole Bangladeshi patients.

Conclusion

The present study finds that patients of liver cirrhosis with encephalopathy show significantly higher prolactin levels. This may suggest that elevated prolactin could be a consequence of metabolic disturbances caused by liver dysfunction.

Recommendation

Longitudinal studies should conduct to assess how changes in serum prolactin levels over time correlate with disease progression and outcomes in liver cirrhosis. Study can be conduct to find out the correlation of serum prolactin level and the severity of liver cirrhosis as measured by child pugh scoring system.

Acknowledgement

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Disclosure

All the authors declared no competing interest.

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Original Article

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Evaluation of Waist-Hip Ratio and BMI among Type 2 Diabetes and Non Diabetic Adults: A Cross Sectional Study from Bangladesh

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Abstract

Background: Obesity particularly central or abdominal obesity can reflect the content of visceral fat and important phenotype of unhealthy metabolism like diabetes mellitus. Basic anthropometric parameters (Weight, height, waist-circumference and hip circumference) and their derived indices (Body mass index, waist-hip ratio) are used as indicators for the presence of diseases and their assessment in clinical practice. These indicators are associated with increased risk of diabetes mellitus. The purpose of the study is to evaluates BMI, WHR, WC among diabetes mellitus and compare them to non-diabetes mellitus patients.

Materials and methods: A cross sectional analytical study conducted from July 2023 to June 2024, in the Department of Biochemistry with the collaboration of Department of Endocrinology at Chittagong Medical College Hospital by non-probability purposive sampling. A total of 140 patients had taken. Of which 70 patients with type II diabetes mellitus and 70 non-diabetes mellitus. Data on sociodemographic character, anthropometric parameter and clinical variables were collected and analyzed using Microsoft excel and IBM -SPSS v 26. Statistical significance was determined using 'test' and chi-square test (χ^2) test with p value <0.05 which was significant and p value <0.01 which was highly significant.

Results: Among study population female predominance were seen. In our study population mean BMI for DM was 27.73 ± 3.40 and non- DM was 26.33 which was statistically significant Mean waist circumference for DM (Male) and (Female) was 93.7 and 94.5 and non-DM (Male) and (Female) was 90.2 and 83.5 which was also significant. In our study mean WHR for DM (male) and (Female)was 0.96 and 0.8 and non-DM (male) and (female) was 0.91 and 0.816 which was statistically significant. A significant (p <0.01) association of anthropometric parameter (BMI, Waist Circumference, Waist-Hip-Ratio) with study population.

Conclusion: The prevalence of increased waist-hip ratio among the study participants were high, irrespective of defining criteria. Even normal weight people have raised waist-hip ratio. Body mass index is not enough alone for clinical assessment by healthcare workers in the study settings. The waist -hip ratio may add clinical value to overcome this situation.

Key words: Body Mass index; Diabetes Mellitus; Non-Diabetes mellitus; Obesity; Waist hip ratio.

Introduction

Noncommunicable diseases are the significant global health challenges.[1] Obesity is a major independent and modifiable risk factor for T2DM and many studies have advocated a progressive increase in the prevalence of T2DM with obesity.[2] According to World Health Organization defines obesity as "abnormal or excessive fat accumulation that may impair health."[3] Obesity is marked by elevated adipose tissue and decreased level of adiponectin, which restricts its ability to inhibit inflammatory process and aggravate inflammatory condition.[4] If the distribution of this adipose tissue

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is mainly concentrated in central or visceral region, it is highly correlated with metabolic disorder.[5] Typically BMI used to identify the risk of future T2DM however, it cannot effectively distinguish between muscle mass and fat mass .In the context of BMI the correlation between waist hip ratio and abdominal obesity seems to be more closely linked to metabolic risk factors.[6] Moreover, excessive fat mass in the body, rather than excessive body weight, debt for the leading cause of increased risk among DM people.[7] Abdominal fat is positively correlated with metabolic abnormalities while fat in lower body has negative correlation.[8] Subcuteneous fat particularly in femoral gluteal region, might provide a depot helping to prevent fat deposition at intraabdominal and visceral sites.[9] On the other hand there is a well-established link between hyperglycaemia and microvascular disease, where chronic high blood sugar levels contribute to damage in small blood vessels, leading to complications such as retinopathy, neuropathy and nephropathy.[10] In previous years it has been established that metabolic disorders are also commonly present in normal weight individual.[11] Individuals with normal weight but abdominal obesity are often not screened about potential health risk associated with excess abdominal fat. Early identification of high-risk individuals is important to prevent or reduce the risk of diabetes and evidence has shown that positive measures, such as weight control and physical activity, are effective in preventing diabetes. The current study evaluates BMI, WHR, WC among diabetes mellitus and compare them to non-diabetes mellitus patients.

Materials and methods

A cross sectional analytical study was conducted over a period of 1 year (July 2023 to June 2024) in Department of Biochemistry and Department of Endocrinology, Chattogram Medical College. A total 140 patients were taken. Of these consecutive 70 were DM patients and 70 non-DM patients as a comparison group to test the hypothesis. Patients attending endocrine outdoor with DM and non-DM having BMI >23 of either sex, age between 30 to 70 years were included in the study. Patients who were taking steroid, tricyclic antidepressants, monoamine oxidase inhibitors and also hypothyroid patients, type 1 DM and women with pregnancy were excluded. After taking approval of Ethical Review committee of Chittagong Medical College study participants were selected from the OPD of the department of endocrine, Chittagong Medical College hospital, who had come for their regular checkup. After taking a brief history, measured anthropometric parameters (BMI, WHR, WC) and preliminary selection the purpose of the study was explained in detail to each subject and their informed verbal consent was taken. Then they were requested to report to department of Biochemistry, CMC in the morning between 8.00 am to 9.00 am following an overnight (8-12 hour) fasting for fasting blood glucose. On the day of blood collection, 2 hours after taking breakfast blood glucose sample was taken. When the study participants were reported, informed written consents were taken. A predesigned case record form was used to record relevant clinical and sociodemographic data from study participants who gave consent. Height and weight were measured by using free standing stadiometer (Wincon, model ZT 120) and calculated BMI (Weight in kg/height in m^2). WC and hip circumference were measured by using measuring tape. WC was measured between midpoint between last rib and iliac crest. Hip circumference was measured by widest point over buttock. The guideline of south. Asian for BMI cut-offs value.

Results

Table I The guideline of South Asian for BMI cut-offs value

Type of Obesity	BMI (kg/m^2)
Overweight	≥ 23-24.9
Obesity	≥ 25

Table II The guideline of WHO cutoff for elevated WHR

Elevated WHR	Value
WHR (Male)	>0.95
WHR (Female)	>0.85

Table III The guideline of IDF modified ATPIII criteria defined obesity by following parameter[12]

Obesity	IDF criteria ATP III
BMI	>23 kg/m^2
WC male	>90 cm
WC female	>80 cm

Statistical analysis was done by using IBM-SPSS 26.0 for windows.

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Table IV Demographic variable among study population

Variable		DM group (n=70)	Non -DM group (n=70)	p value (t test)
Age (Years)	(Mean ±SD)	47.37± 7.9	48.11±9.6	0.5>0.05
	Range	35-68	35-63	
Gender	Male	34(48.5%)	27(38.6%)	
	Female	36(51.5%)	43(61.4%)	0.02<0.05*
Duration of DM (Years)	(Mean ±SD)	5.05±4.97		

Table IV showing that among the study population, the mean age for DM group was 47.37 years and non -DM group was 48.11 years. Among DM group male were 48.5% and female were 51.5%. 38.6% were male and 61.4% were female in non-DM. The mean duration of DM was 5years.

Table V Anthropometric parameter between study participants (n=140)

Variable	DM group n=70		Non- DM group n=70		p-value
BMI (Kg/m^2) (Mean± SD)	27.73±3.40		26.33±3.25		0.04,< 0.05* (t test)
Waist circumference (cm) (Mean± SD)	Male	Female	Male	Female	0.001,<0.01** (t test)
	93.7	94.5	90.2	83.5	
Hip circumference (cm) (Mean ± SD)	109.44±12.20		99.76±6.68		0.001;<0.01** (t test)

*p-value significance <0.05

**p-value highly significant <0.01

Table V showing comparison of mean BMI among DM group was 27.73±3.40 and non-DM group was 26.33±3.25. Mean waist circumference among DM group (Male) was 93.7 and DM group (Female) was 94.5 and non-DM group (Male) was 90.2 and non-DM (Female) was 83.5. There was significant mean difference in BMI, Waist circumference, Hip circumference and among study population.

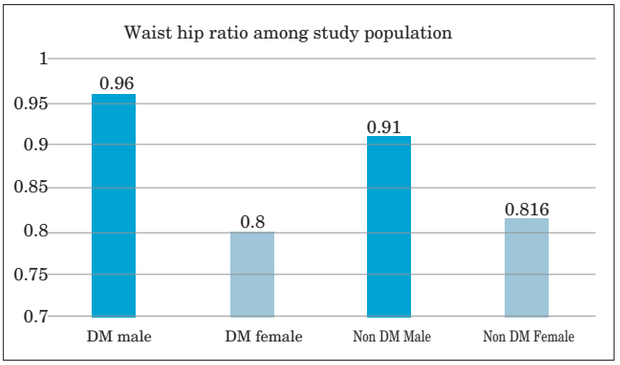

Figure 1 Mean waist hip ratio (Male & Female) in DM and non-DM group.

Table VI Comparison of increased mean anthropometric parameter among male population.

Variable	Diabetic Male	Non-Diabetic Male	p value
BMI	28.39 ± 3.73	27 ± 1.67	0.23
Waist circumference	102.08 ± 3.98	92.11 ± 2.36	0.0001**
Waist-hip ratio	1.00 ± 0.04	0.95 ± 0.01	0.006**

Table VI showing comparison of increased mean BMI among DM (Male) was 28.39 ± 3.73 and non-DM (Male) was .27±1.67, WHR among DM (Male) was 1.00±0.04 and non- DM (Male was 0.95 ± 0.01, WC among DM (Male) was 102.08±3.98 and non-DM (Male) was 92.11±2.36. There was significant increased mean difference in WHR, WC among DM and non-DM (Male).

Table VII Comparison of mean increased BMI, Waist Hip Ratio, Waist circumference among DM and Non-DM (Female)

Variable	Diabetic Female	Non-Diabetic female	p value
BMI	28.4 ± 3.2	28.3 ± 3.5	0.94
Waist circumference	98 ± 7.4	88.15 ± 2.5	0.0001**
Waist-hip ratio	0.92 ± 0.04	0.86 ± 0.02	0.00001**

Table VII showing comparison of mean increased BMI among DM (Female) was 28.4±3.2 and Non-DM (Female) was 28.3 ± 3.5, increased mean Waist Hip ratio (Female) among DM (Female) was 0.92±0.04 and Non-DM (Female) was 0.86±0.02, increased Waist circumference among DM (Female) was 98±7.4 and Non-DM (Female) was 88.15±2.5. There was significant increased mean difference in Waist hip ratio, waist circumference among DM and Non-DM (Female).

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Table VIII Association of anthropometric indices with study population

Variable		DM Group n=70	Non-DM Group n=70	Total (χ^2) test	p value
BMI (kg/m^2)	≥25	58(82.9%)	39(55.7%)	97(69.3%)	0.0001, <0.01**
	≤25	12(17.1%)	31(44.3%)	43(30.7%)	
Waist circumference (cm)	Increased (Male >90cm, Female >80cm)	59(84.3%) (Male=23, Female=36)	44(62.9%) (Male=13, Female=31)	103(73.6%)	0.004, <0.05*
	Normal (Male ≤ 90cm, Female ≤80cm)	11(15.7%) (Male=10, Female=01)	26(36.1%) Male=20, (Female=06)	37(26.4%)	
Waist-Hip ratio	Increased (Male ≥0.5, Female ≥0.85cm)	34(48.6%) (Male=12, Female=22)	21(30%) (Male=07 Female=14)	55(39.3%)	0.001 <0.01**
	Normal (Male <0.5, Female <0.85)	36(51.4%) (Male=21, Female=15)	49(70%) (Male=20, Female=29)	85(60.7%)	

Table VIII showed Chi-square test for the association of anthropometric indices with study population. There was a significant association of BMI (p-value <0.01) waist circumference (p-value <0.05) and Waist-Hip ratio (p-value <0.01) with the DM group.

Table IX Biochemical variable among study population

Variable	DM(n=70)	Non-DM (n=70)	p value
FBG	8.62±3.03	5.82±1.67	0.02, <0.05* (t test)
PPBG (mmol/l) (Mean ± SD)	20.29±48.30	7.27±1.7	0.0001, <0.01** (t test)

*p-value significance<0.05
**p-value highly significant <0.01.

Table IX shows independent t test for the comparison of mean FBG among DM group is 8.62±3.03 and non-DM group is 5.82±1.67. The comparison of mean PPBG in DM group is 20.29±48.30 and non-DM is 7.27±1.7. There is a significant mean difference between study population.

Discussion

In our study age was matched (p value >0.05) among 70 diabetic and 70 non-diabetic patients. Majority of patients were female among patients with or without diabetes mellitus. Female predominancy showed in the study Akter et al.[14] Among the study population mean BMI in DM and non-DM were 27.73±3.40 & 26.33 (p value <0.05). In Pankaj, Akolkar et al. observed mean BMI for DM was 26.33 and for non-DM was 24.56 (p value <0.01).[12] In our study mean waist circumference among DM (Male) was 93.7 and DM (Female) 94.5 and non-DM (Male) was 90.2 and non-DM (Female) 83.5 which was significant (p value <0.01). In Pankaj, Akolkar et al. found mean waist circumference for DM was 96.08 and non-DM was 89.48.[12] These differences showed significant (p value <0.01). The mean waist circumference observed by Sharmin Sultana was 93 cm in DM group male and female it was 91 cm.[15] In our study we researched mean waist hip ratio for DM (Male) 0.96 and DM (Female) 0.80 and non -DM (Male) was 0.91 and non-DM (Female) 0.816. These differences were also significant (p-value <0.05). Sharma et al found mean waist hip ratio was 1.01±0.01 in DM group.[16] There p value was <0.01. Sharmin S et al. found mean waist hip ratio for DM group for male was 0.92 and female 0.88.[15] Variation in mean value of parameter due to sociodemographic character, lifestyle. In our study we compare mean increased parameter among DM and non-DM male and female but significant p value (<0.05) showed in increased waist hip ratio and waist circumference.

In study of Pankaj Akolkar et al. showed frequency of obesity parameter according to IDF modified ATP III criteria and WHO guideline for waist hip ratio in patients with or without DM.[12] In their study BMI >23 associated with DM group was 82% (41) and non-DM group was 60% (30) which was significant (p value <0.01). Their waist circumference was also associated with DM and non-DM was 94% (47) and 72% (36) which p value (<0.01). These data were similar to our study. In Pankaj Akolkar showed waist hip ratio not associated with DM (p value <0.01) which was insignificant.[12] These data were not similar to our study because of small sample size, socio demographic character and life style. Aghaei Masoom et al. researched increased waist -hip ratio was associated with DM.[17] Their frequency for

increased waist hip ratio for DM was 73.5% which was significant (p value <0.001) which was similar to our study findings. The results highlight the significance of treating central obesity (Increased waist hip ratio) in managing diabetes mellitus and lowering associated health risk, as they imply that these indicators are more predictive of acute beginning of disease in order to lowering the risk of morbidity.

Limitation

The study was conducted in a single hospital and are not representative of the whole population because of small sample size.

Conclusion

This study findings highlights the importance of central obesity as a risk factor among diabetes mellitus patients. Beside reducing weight we should emphasize on waist hip ratio. We have different limitations to assess obesity. Among then BMI has been used for a long time as a reference to diagnose and classify obesity .It does not quantify visceral fat or differentiate between excess fat ,muscle or bone mass .We should highlighted the significance of waist- hip ratio as an anthropometric indicator for adipose tissue in obesity and also indicated that waist hip ratio is more effective for taking preventive measures and predicting metabolic diseases.To fill the knowledge gap the present study leading to improved public health outcome and awareness in Bangladesh.

Recommendation

Different sub group analysis (Older, younger) should be recommended.

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Disclosure

All the authors declared no competing interest.

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Original Article

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Vitamin D Supplementation and Risk Reduction of Preeclampsia in Rural Pregnant Women: A Randomized Trial

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Abstract

Background: Preeclampsia is a pregnancy-specific multisystem disorder. One of the proposed hypotheses is that vitamin D supplementation during pregnancy may reduce the risk of preeclampsia, particularly among women with a history of preeclampsia and/or gestational hypertension. This hospital-based randomized controlled trial aimed to explore the effect of vitamin D supplementation on the recurrence of preeclampsia among rural pregnant women with a history of preeclampsia.

Materials and methods: The present study was a randomized controlled clinical trial conducted at a 250 Bedded Hospital in Jashore District from January 2023 to December 2024 and in selected private chambers. A total of 50 pregnant women with a documented history of preeclampsia were enrolled. Among them, 25 were allocated to the control group and 25 to the intervention group. Vitamin D supplementation (20,000 IU cholecalciferol) was initiated between 14–20 weeks of gestation and continued once every two weeks until the 36th week of pregnancy. Baseline serum vitamin D levels were measured before initiation of supplementation. The control group received placebo.

Results: Among 50 respondents the age group from control group were 36% in women aged 18-25 years, 48% in women aged 26-35 years, and 16% in women aged 36-45 years and from intervention group 36% in18-25 years, 52% in 26-35 years and 12% in 36-45 years. Among control group 40% completed primary level, 32% secondary and 28% completed higher secondary beside this in intervention group 52% completed primary education, 28% completed secondary and 20% completed higher secondary level. Prevalence also varied significantly by Gravida. Among control group 52% in 2nd gravida, 48% in 3rd gravida and among intervention group 40% in 2nd gravida, 36% in 3rd gravida and 24% in > 4th gravida which showed significant p value 0.03. According to employment status among control group 76% were un employed and 24% were employed. On the other side among intervention group 60% were employed and 40% were unemployed. Employment status also significantly associated and p value was 0.01. According to presence of non-communicable diseases among control group 76% were diabetic and 24% were non diabetic. On intervention group 64% were diabetic and 36% were non diabetic. On the ground of baseline parameters on mean blood pressure the systolic bold pressure among control group were 115 mm of hg and diastolic were 85 mm of hg. Among intervention group the systolic blood pressure were 120 m of hg and diastolic blood pressure were 90 mm of hg. Both control and intervention group who were suffered from gestational hypertension on their current pregnancy 24 hours proteinuria was investigated. Among control group mean 24 hrs. proteinuria was 132.22/1844.91 ± 61.447 and among intervention group it was 154.94/1958.53 ± 53.376 which was significantly associated and p value 0.023.Level of serum vitamin D were estimated on both groups.

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Serum vitamin D levels were measured in both groups at baseline. The mean serum 25-hydroxyvitamin D concentration was 45 ng/mL in the control group, which is within the normal range, whereas it was 20 ng/mL in the intervention group, indicating vitamin D deficiency. This difference was statistically significant (p = 0.001). Among control group termination of pregnancy by NVD were 32%, by C/S 56% and 12% by abortion. On the other hand, among intervention group 72% by NVD, 28% by C/S which was significantly associated and p value 0.01. among control group 60% were suffered from preeclampsia and 40% were non-preeclamptic whereas on intervention group 24% were preeclamptic and 76% were non-pre-eclamptic. Which showed significant association and p value were 0.01. The risk of preeclampsia was 2.5 times higher in control group then intervention group.

Conclusion: Vitamin D supplementation has a protective effect against recurrent preeclampsia among pregnant women with a history of preeclampsia with or without gestational hypertension in previous pregnancies.

Key words: Fetal health; maternal health; Non-communicable diseases; Pre-eclampsia; Pregnant women.

Introduction

Preeclampsia is a pregnancy-specific multisystem disorder characterized by new-onset hypertension after 20 weeks of gestation accompanied by maternal organ dysfunction and/or proteinuria. Although proteinuria is a common feature, it isnot mandatory for diagnosis. Current diagnostic criteria emphasize evidence of end-organ involvement such as renal insufficiency, hepatic dysfunction, neurological symptoms, hematological abnormalities, or uteroplacental insufficiency. Preeclampsia complicates approximately 2–8% of all pregnancies and accounts for nearly 25% of maternal deaths and significant perinatal morbidity and mortality worldwide.[1] Proteinuria is defined as excretion of more than 300 mg of protein in 24-hour urine collection, protein-creatinine ratio of 0.3 or higher in random urine samples, or consistent amount of protein (i.e. 30 mg per deciliter) in randomly taken samples of urine (i.e. +1 result on dipstick).[1] Factors contributing to preeclampsia are diabetes, chronic hypertension before pregnancy, chronic kidney diseases, nulliparity, twin or multiple pregnancy, family history of preeclampsia or eclampsia, obesity, immune disorders and a personal history of preeclampsia, or eclampsia.Vitamin D is especially important during pregnancy as low maternal vitamin D stores may contribute to problems such as low birth weight and small for gestational age infants, as well an increased risk of maternal comorbidities.[2] Vitamin D deficiency is worldwide epidemic, with a prevalence that ranges from 18% to 84% depending on the country of residence, ethnicity and local clothing customs and dietary intake.[3,4] Clinical studies establishing an association between vitamin D levels and adverse pregnancy outcomes such as preeclampsia, gestational diabetes and low birth weight, preterm labor and caesarean delivery have conflicting results.[5] Clinical studies establishing an association between vitamin D levels and adverse pregnancy outcomes such as preeclampsia, gestational diabetes, and low birth weight, preterm labor and caesarean delivery have conflicting results.[5-9] The aim of the study to explore the effect of Vitamin D supplimentation on the recurrence of pre-eclampsia among rural pregnant women with a history of pre-eclampsia.

Materials and methods

The hospital-based randomized controlled trial was conducted at a 250-bedded hospital in Jashore District and selected private chambers from January 2023 to December 2024. The study aimed to evaluate the effect of vitamin D supplementation on the recurrence of preeclampsia among rural pregnant women with a history of preeclampsia.

Inclusion Criteria

- Singleton pregnancy
- Gestational age 14–20 weeks at enrollment
- Documented history of preeclampsia in a previous pregnancy
- Willingness to provide informed written consent

Exclusion criteria

- Chronic kidney disease
- Autoimmune disorders
- Chronic liver disease
- Current intake of high-dose vitamin D or calcium supplementation.

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Measurement of Vitamin D

Baseline serum 25-hydroxyvitamin D levels were measured before starting supplementation to assess deficiency status and to evaluate its role as a risk factor for recurrence of preeclampsia.

Intervention

Eligible participants were randomly assigned to either:

- Intervention group: Oral vitamin D (20,000 IU) once every two weeks from enrollment until 36 weeks of gestation
- Control group: Placebo administered with the same schedule

Vitamin D (20,000 IU) once every two weeks from enrollment until 36 weeks of gestation[10,11]

Blood pressure was measured every two weeks. If systolic BP ≥140 mmHg or diastolic BP ≥90 mm Hg, urine protein testing was performed. Data were analyzed using SPSS version 24. Chi-square test and relative risk estimation were applied.

Results

Table I Distribution of respondents according to sociodemographic and baseline characteristics

Total Pregnant Women Studied (50)	Control Group (25)	%	Intervention Group (25)	%	p value
Age Group					
18-25 years	09	36%	09	36%	0.5
26-35 years	12	48%	13	52%	
36-45 years	04	16%	03	12%	
Education					
Primary or below	10	40%	13	52%	0.6
Secondary	8	32%	7	28%	
Higher secondary	7	28%	5	20%	
Occupation					
Employed	06	24%	15	60%	0.01
Unemployed	19	76%	10	40%	
Gravida					
2	13	52	10	40	0.03
3	12	48	9	36	
>4	0	0	6	24	
Non-Communicable					
Diseases					
DM present	06	24%	09	36%	0.3
DM absent	19	76%	16	64%	
Baseline parameters					
Average Blood Pressure					
Systolic	115		120		0.94
Diastolic	85		90		
24 h proteinuria (mg/cc, mean ± SD)	132.22/ 1844.91 ± 61.447		154.94/ 1958.53 ± 53.376		0.023
Mean Serum Vitamin D level	45 ng/ml		20 ng/ml		0.001

Table I describes among 50 respondents 25 were control group and 25 intervention group. The age group from control group were 36% in women aged 18-25 years, 48% in women aged 26-35 years, and 16% in women aged 36-45 years and from intervention group 36% in18-25 years, 52% in 26-35 years and 12% in 36-45 years. Among control group 40% completed primary level, 32% secondary and 28% completed higher secondary beside this in intervention group 52% completed primary education, 28% completed secondary and 20% completed higher secondary level. Prevalence also varied significantly by Gravida. Among control group 52% in 2nd gravida, 48% in 3rd gravida and among intervention group 40% in 2nd gravida, 36% in 3rd gravida and 24% in > 4t^{h} gravida which showed significant p value 0.03. Accordingto employment status among control group 76% were unemployed and 24% were employed. On the other side among intervention group 60% were employed and 40% were unemployed. Employment status also significantly associated and p value was 0.01. According to presence ofnon-communicable diseases among control group 76% were diabetic and 24% were non diabetic. On intervention group 64% were diabetic and 36% were non diabetic.

On the ground of baseline parameters on average systolic and diastolic blood pressure values represent baseline measurements before initiation of vitamin D supplementation average blood pressure the systolic blood pressure among control group were 115 mm of hg and diastolic were 85 mm of hg. Among intervention group the systolic blood pressure were 120 m of hg and diastolic blood

pressure were 90 mm of hg. Both control and intervention group who were suffered from gestational hypertension on their current pregnancy 24 hours proteinuria was investigated. Among control group mean 24 hrs. proteinuria was 132.22/1844.91 ± 61.447 and among intervention group it was 154.94/1958.53 ± 53.376 which was significantly associated and p value 0.023.Serum vitamin D levels were measured in both groups at baseline. The mean serum 25-hydroxyvitamin D concentration was 45 ng/mL in the control group, which is within the normal range, whereas it was 20 ng/mL in the intervention group, indicating vitamin D deficiency. This difference was statistically significant (p = 0.001).

Table II Comparison of pregnancy types and end of pregnancy for intervention and control groups.

Group	Termination of pregnancy			p value
	NVD	C/S	Abortion	
Control group	08	14	3	0.01
Intervention group	18	7	0	
Total	26	21	3	

Table II describes among control group termination of pregnancy by NVD were 32%, by C/S 56% and 12% by abortion. On the other hand, among intervention group 72% by NVD, 28% by C/S which was significantly associated and p value 0.01.

Table III Comparison of preeclampsia incidence between intervention group and control group

Group	Non-preeclampsia	Preeclampsia	p value
Control group	10	15	0.01
Intervention group	19	06	
Total	29	21	

Table III describes the final outcome of the present study was after received vitamin D3 for intervention group and Placebo for Control Group recurrence of preeclampsia in the intervention group was significantly lower (p value = 0.01) probability of preeclampsia than patients in the control group. Among control group 60% were suffered from preeclampsia and 40% were non-preeclamptic whereas on intervention group 24% were preeclamptic and 76% were non-pre-eclamptic.

Table IV Relative risk

Group	Non preeclampsia	Preeclampsia	p value	Relative risk
Control group	10	15	0.01	2.5
Intervention group	19	06		

Table IV describes risk of preeclampsia was 2.5 times higher in control group then intervention group. The risk of preeclampsia was 2.5 times higher in control group then intervention group.[12,13]

Discussion

The findings of this hospital-based randomized control trial study provide valuable insights into the effect of vitamin D supplementation in preeclampsia among chronic hypertensive respondents at Jashore area. Among 50 respondents 25 were control group and 25 intervention group. The age group from control group were 36% in women aged 18-25 years, 48% in women aged 26-35 years, and 16% in women aged 36-45 years and from intervention group 36% in18-25 years, 52% in 26-35 years and 12% in 36-45 years. Among control group 40% completed primary level, 32% secondary and 28% completed higher secondary beside this in intervention group 52% completed primary education, 28% completed secondary and 20% completed higher secondary level. Prevalence also varied significantly by Gravida. Among control group 52% in 2nd gravida, 48% in 3rd gravida and among intervention group 40% in 2nd gravida, 36% in 3rd gravida and 24% in > 4^{th} gravida which showed significant p value 0.03. Another study revealed similar findings with this study.[6]According to employment status among control group 76% were unemployed and 24% were employed. On the other side among intervention group 60% were employed and 40% were unemployed. Employment status also significantly associated and p value was 0.01. According to presence of non-communicable diseases among control group 76% were diabetic and 24% were non diabetic. On intervention group 64% were diabetic and 36% were non diabetic. On the ground of baseline parameters on mean blood pressure the systolic bold pressure among control group were 115 mm of hg and diastolic were 85 mm of hg. Among intervention group the systolic blood pressure were 120 m of hg and diastolic blood pressure were 90 mm of hg. Both control and

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intervention group who were suffered from gestational hypertension on their current pregnancy 24 hours proteinuria was investigated. Among control group mean 24 hrs. proteinuria was 132.22/1844.91 ± 61.447 and among intervention group it was 154.94/1958.53 ± 53.376 which was significantly associated and p value 0.023. Serum vitamin D levels were measured in both groups at baseline. The mean serum 25-hydroxyvitamin D concentration was 45 ng/mL in the control group, which is within the normal range, whereas it was 20 ng/mL in the intervention group, indicating vitamin D deficiency. This difference was statistically significant (p = 0.001). Among control group termination of pregnancy by NVD were 32%, by C/S 56% and 12% by abortion. On the other hand, among intervention group 72% by NVD, 28% by C/S which was significantly associated and p value 0.01. among control group 60% were suffered from preeclampsia and 40% were non-preeclamptic whereas on intervention group 24% were preeclamptic and 76% were non-pre-eclamptic. Which showed significant association and p value were 0.01.Another study revealed that the final outcome of the study was recurrence of preeclampsia in the intervention group and control group. The patients in the intervention group have significantly lower (p value = 0.036) probability of preeclampsia than patients in the control group.[6] The risk of preeclampsia was 2.5 times higher in control group then intervention group. Findings from another study was the risk of preeclampsia for the control group was 1.94 times higher than for intervention group (95% CI 1.02, 3.71). A recent meta-analysis has demonstrated a correlation between vitamin D and preeclampsia in various study types. They show that vitamin D could act as a preventive factor for preeclampsia.[9,12-15] A randomized controlled trial compared the daily administration of 400, 2000, or 4000 IU of vitamin D in pregnant women starting at 12 to 16 weeks of pregnancy until childbirth. The risk of preeclampsia recurrence is increased in women with a history of preeclampsia. Maternal and neonatal complications are more common in cases of recurrent preeclampsia when compared to the initial episode.[8]

Conclusion

Vitamin D supplementation in chronic hypertensive pregnant respondents may reduce the incidence of preeclampsia.

Disclosure

All the authors declared no competing interest.

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Original Article

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Orchiopexy for Undescended Testes in Children: Surgical Experience, Associated Factors and Outcome Assessment

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Abstract

Background: Undescended Testis: Where the testicles are not in the usual place in the scrotum. The aim to the study to evaluate intraoperative challenges, postoperative complications, demographic and socioeconomic factors and their association with surgical outcomes in pediatric patients undergoing orchiopexy for Undescended Testes (UDT).

Materials and methods: A consecutive sampling technique was used. All eligible pediatric patients with undescended testes presenting to the study centers during the study period and fulfilling the inclusion criteria were enrolled consecutively until the desired sample size was achieved.Study was conducted from January to December 2024, including 80 children aged 6 months to 12 years with UDT at Ad-Din Medical College and private practice. Demographic, perinatal, socioeconomic, clinical and surgical data were collected. Statistical analysis included chi-square, ANOVA and logistic regression to identify predictors of complications and parental satisfaction.

Results: Mean age was 3.4 ± 2.1 years; 81% had unilateral UDT. Most testes were located in the inguinal canal (63%). Intraoperative difficulties occurred in 60% of cases, including narrow inguinal canal (24%) short spermatic cord (19%) and high testicular position (16%). Overall complication rate was 16%, comprising scrotal edema (10%), hematoma (5%), infection (3.7%), and testicular atrophy (2.5%). Percentages are calculated based on the total number of patients (n = 80). The sum of complications exceeds the number of affected patients because some children developed more than one postoperative complication. Higher complication rates were associated with age >6 years, rural residence, lower parental education, prematurity, low birth weight, delayed presentation and junior surgeon experience ($p < 0.05$). Parental satisfaction was positively associated with higher socioeconomic status and absence of complications. These findings are consistent with prior international studies highlighting age, anatomical challenges, surgeon experience and socioeconomic factors as predictors of outcomes.

Conclusion: Orchiopexy is safe and effective for UDT. Complications are influenced by delayed presentation, high testicular position, prematurity, low birth weight, rural residence, lower parental education, and less experienced surgeons. Early referral, parental education, skilled surgical care, and tailored perioperative management are crucial for optimal outcomes, in line with global literature.

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Introduction

Undescended Testis (UDT) or cryptorchidism, is a common congenital anomaly affecting 1–3% of full-term and up to 30% of preterm male neonates.[1.2] Untreated UDT increases the risk of infertility, testicular malignancy, and psychological impact.[3.4] Orchiopexy, surgical fixation of the testis in the scrotum, is recommended between 6–18 months to optimize fertility potential and minimize cancer risk.[5.6] In developing countries, delayed presentation is common due to socioeconomic

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barriers, low parental awareness, and limited access to healthcare.[7-9] Most prior studies have focused primarily on clinical and surgical aspects.[10-15] However, demographic, perinatal and socioeconomic variables - such as parental literacy, income, residence, family size and birth order-may significantly influence timing, intraoperative challenges, postoperative complications and parental satisfaction.[16,7,17] This study aims to comprehensively assess surgical outcomes of orchiopexy in children and analyze the impact of demographic, perinatal, socioeconomic, clinical and surgical factors.

Materials and methods

Aconsecutive sampling techniquestudy was conducted at a tertiary pediatric surgery center from March 2023 to March 2025. Eighty children aged 6 months to 12 years with UDT were included.

Inclusion and Exclusion criteria

Inclusion: Unilateral or bilateral UDT, no prior inguinal surgery.

Exclusion: Retractile testes, syndromic children, prior orchiopexy, Buried penis or concealed penis.
Variables recorded:

- **Demographic:** Age, residence (Urban/rural) birth order, family size.
- **Perinatal:** Gestational age, birth weight, neonatal complications.
- **Socioeconomic:** Parental education, monthly income, occupation, family type, literacy, access to healthcare.
- **Clinical:** Laterality, testicular position, comorbidities, delay in presentation.
- **Surgical:** Operative time, anesthesia type, surgeon experience, intraoperative difficulties. Mode of anesthesia: All procedures were performed under standardized general anesthesia. Anesthetic protocol: Same institutional protocol (Propofol + inhalational maintenance ± caudal block). Surgeon consistency: Each case was performed or supervised by a single designated surgeon, categorized as junior (<5 years) or senior (≥5 years)
- **Postoperative:** Complications, parental satisfaction (Likert scale 1–5). Postoperative pain assessment was age-appropriate: Children ≥6 years: Visual Analog Scale (VAS), Children <6 years:FLACC scale (Face, Legs, Activity, Cry, Consolability) Pain scores were recorded at 6, 12 and 24 hours postoperatively.
- **Antibiotic policy:** A single prophylactic intravenous dose of cefuroxime (30 mg/kg) was administered at induction.No routine postoperative antibiotics were prescribed unless clinical infection developed.

SPSS v25 was used. Categorical variables were analyzed using chi-square, continuous variables using ANOVA. Logistic regression identified predictors of postoperative complications. Significance was set at $p < 0.05$.

Results

Table I Demographic, Perinatal, and Socioeconomic Characteristics

Variable	Category	n (%)
Age (Years)	<2	26 (32.5%)
	2–6	34 (42.5%)
	>6	20 (25.0%)
Residence	Urban	38 (47.5%)
	Rural	42 (52.5%)
Birth order	First	30 (37.5%)
	Second or higher	50 (62.5%)
Family size	4 members	40 (50%)
	>4 members	40 (50%)
Gestational age	Term (37 weeks)	65 (81.3%)
	Preterm (<37 weeks)	15 (18.7%)
Birth weight	2.5 kg	60 (75%)
	<2.5 kg	20 (25%)
Parental education	None/Primary	38 (47.5%)
	Secondary/Higher	42 (52.5%)
Monthly income (BDT)	<15,000	48 (60%)
	≥15,000	32 (40%)
Parental occupation	Unskilled labor	36 (45%)
	Skilled/professional	44 (55%)
Family type	Nuclear	52 (65%)
	Joint	28 (35%)

The study included 80 children with undescended testes. The mean age was 3.4 ± 2.1 years. Among them, 32.5% were younger than 2 years, 42.5% were between 2 and 6 years and 25% were older than 6 years. Slightly more than half of the participants resided in rural areas (52.5%) compared to urban areas (47.5%). Regarding birth order, 37.5% were first-born, while 62.5% were second-born or higher. Family size was evenly

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distributed, with half (50%) having >4 members and the other half having >4 members. Most children were born at term (81.3%) and 18.7% were preterm. Birth weight was ≥2.5 kg in 75% of children and <2.5 kg in 25%. Parental education was low in nearly half of the families (47.5% had no formal or only primary education) while 52.5% had secondary or higher education. Regarding monthly income, 60% of families earned less than 15,000 BDT and 40% earned ≥15,000 BDT. For parental occupation, 45% were engaged in unskilled labor, while 55% were in skilled or professional occupations. Nuclear families predominated (65%) with 35% living in joint family arrangements. These findings indicate a mixed demographic and socioeconomic background, with a notable proportion of rural, low-income and lower-educated families, which may influence the timing of presentation and surgical outcomes.

Table II Clinical and Sur ings

Parameter	n (%)
Laterality	Unilateral 65 (81%)
	Bilateral 15 (19%)
Testicular location	Inguinal canal 50 (63%)
	Superficial ring 18 (22.5%)
	Intra-abdominal 12 (15%)
Intraoperative difficulties	Present 48 (60%)
- Narrow inguinal canal	19 (24%)
- Short spermatic cord	15 (19%)
- High testicular position	13 (16%)
Anesthesia Type	General 48 (60%)
	Local 32 (40%)
Surgeon experience	Junior (<5 years) 30 (37.5%)
	Senior (≥5 years) 50 (62.5%)

Among the 80 children, the majority (81%) had unilateral undescended testes, while 19% had bilateral involvement. The most common testicular location was the inguinal canal (63%) followed by the superficial inguinal ring (22.5%) and intra-abdominal position (15%). Intraoperative difficulties were encountered in 60% of cases. Specific challenges included a narrow inguinal canal in 24% of children, a short spermatic cord in 19% and high testicular position in 16%, highlighting technical complexity in certain anatomical presentations. Regarding anesthesia, general anesthesia was used in 60% of patients, while local anesthesia was employed in 40%. Surgeon experience varied: 37.5% of procedures were performed by junior surgeons with less than 5 years of experience and 62.5% were carried out by senior surgeons with 5 or more years of experience.

These findings underscore that laterality, testicular location and anatomical challenges can influence operative planning and complexity. Additionally, surgeon experience and anesthesia type are important considerations for optimizing surgical outcomes.

Table III Postoperative Outcomes

Complication	n (%)
Scrotal edema	8 (10.0)
Hematoma	4 (5.0)
Infection	3 (3.7)
Testicular atrophy	2 (2.5)
Recurrence	0 (0.0)

Percentages are calculated based on the total number of patients (n = 80). The sum of complications exceeds the number of affected patients because some children developed more than one postoperative complication. Scrotal edema was defined as clinically significant swelling persisting beyond 72 hours, associated with Tense scrotal skin, Pain or discomfort, Delayed ambulation or parental concernrequiring additional observation or intervention. Mild transient edema resolving within 72 hours was not considered a complication. Assessed clinically by: Scrotal circumference comparison, Skin tension and tenderness, Need for analgesics or supportive measures Postoperative complications were observed in 16% of children. The most common complication was scrotal edema, affecting 10% of patients, followed by hematoma in 5% and surgical site infection in 3.7%. Testicular atrophy was rare, occurring in 2.5% of cases, and no recurrences were reported during the follow-up period. Overall, the complication rates were within the expected range for pediatric orchiopexy procedures and were generally minor, emphasizing the safety and effectiveness of the surgical technique used. The low incidence of testicular atrophy and absence of recurrence reflect meticulous surgical handling and appropriate perioperative management.

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Table IV Associations with Complications and Parental Satisfaction

Factor	Complication Rate (%)	p-value	Parental Satisfaction (Mean ± SD)	p-value
Age (>6 vs ≤6 years)	30% vs 10%	0.02*	3.5 ± 0.9 vs 4.2 ± 0.6	0.01*
Residence (Rural vs Urban)	26.2% vs 7.9%	0.01*	3.6 ± 0.8 vs 4.5 ± 0.5	0.002*
Birth weight (<2.5 kg vs ≥2.5)	35% vs 8.3%	0.003*	3.4 ± 0.7 vs 4.4 ± 0.6	<0.001*
Prematurity (Yes vs No)	40% vs 10.8%	0.001*	3.3 ± 0.8 vs 4.3 ± 0.5	<0.001*
Delay in presentation (>12 mo)	33.3% vs 7.5%	0.001*	3.2 ± 0.7 vs 4.5 ± 0.6	<0.001*
Parental education (Low vs High)	29% vs 6.7%	0.001*	3.5 ± 0.8 vs 4.6 ± 0.4	<0.001*
Surgeon experience (Junior vs Senior)	33.3% vs 6%	<0.001*	3.4 ± 0.7 vs 4.5 ± 0.5	<0.001*
Intraoperative difficulties	30% vs 2.5%	<0.001*	3.3 ± 0.7 vs 4.6 ± 0.4	<0.001*

Children older than six years had a significantly higher proportion of patients experiencing at least one postoperative complication compared to those aged six years or younger (30% vs 10%, p = 0.02). Similarly, higher complication rates were observed among children from rural areas, those with low birth weight, prematurity, delayed presentation, lower parental education, procedures performed by junior surgeons, and cases with intraoperative difficulties (All p < 0.05). Parental satisfaction scores were significantly lower in all these high-risk groups.

Discussion

In this study, children older than six years had higher complication rates (30% vs 10%, p = 0.02), consistent with Hadziselimovic and Herzog, who reported increased surgical challenges and complication risk in older children due to decreased tissue elasticity and longer spermatic cords.[16] Early orchiopexy, ideally between 6 and 18 months, optimizes fertility potential and minimizes testicular damage.[5,6] Our cohort demonstrated delayed presentation was more common among children from rural areas, families with lower parental education and lower socioeconomic status (p < 0.05), which aligns with observations by Rawat et al. and Koyle et al.[7,8,9,17,18]

Intra-abdominal testes and testes located high in the inguinal canal required longer operative times and were associated with postoperative edema and hematoma, consistent with Docimo et al.[11,19] Intraoperative difficulties were encountered in 60% of cases, including narrow inguinal canal (24%) short spermatic cord (19%) and high testicular position (16%). These challenges were particularly pronounced in preterm and low birth weight infants, confirming the findings of Choi et al. and Hutson et al.[20,21] Socioeconomic factors influenced both complications and parental satisfaction. Rural residence, lower parental education, and lower family income were associated with delayed presentation and higher complication rates (p < 0.05).[7,8,9,17] Low parental literacy correlated with lower parental satisfaction (3.5 vs 4.6, p < 0.001) emphasizing the importance of preoperative counseling and targeted educational interventions.[17] Prematurity and low birth weight were significant predictors of postoperative complications. Preterm infants had a 40% complication rate versus 10.8% in term infants (p = 0.001) and low birth weight (<2.5 kg) infants had a 35% complication rate versus 8.3% for infants ≥2.5 kg (p = 0.003).[20,21] Surgeon experience was also critical: procedures performed by junior surgeons (<5 years experience) had higher complication rates (33.3% vs 6%, p < 0.001) and lower parental satisfaction (3.4 vs 4.5, p < 0.001), corroborating the observations of Smith et al. Structured mentorship and simulation-based training can mitigate these risks.[22] The overall postoperative complication rate in our study was 16%, including scrotal edema (10%) hematoma (5%) infection (3.7%) and testicular atrophy (2.5%), which is comparable to multicenter studies by Bianchi et al. and Reddy et al.[23,24] Parental satisfaction correlated with socioeconomic status, complication rate, surgeon experience, and counseling quality, highlighting the multifactorial determinants of outcome.[9,17] Our study reinforces that demographic, perinatal, socioeconomic, anatomical, and surgical factors collectively influence outcomes of pediatric orchiopexy. Early referral, parental education, meticulous surgical technique and experienced surgical teams are essential to reduce complications and improve satisfaction. These findings align with prior studies while providing detailed context on socioeconomic and demographic predictors in a Bangladeshi cohort.

Conclusion

Orchiopexy is a reliable and effective intervention for children with UDT, with low overall complication rates. Our study demonstrates that outcomes are influenced not only by anatomical and surgical factors but also by demographic, perinatal and socioeconomic characteristics. Children older

than six years, those from rural areas, those with low birth weight or prematurity, and those operated on by less experienced surgeons had higher complication rates and lower parental satisfaction. Early referral, preoperative counseling, skilled surgical management, and attention to socioeconomic barriers are essential to optimize outcomes.

Disclosure

All the authors declared no conflicts of interest.

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Original Article

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Efficacy of Physical Treatment Modalities in Acne Vulgaris: A Hospital Based Study among Urban Patients

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Abstract

Background: Acne vulgaris is a prevalent inflammatory skin condition involving blockage and inflammation of the pilosebaceous units. While various treatments exist, physical extraction remains a key intervention in reducing lesion severity and accelerating recovery, especially in moderate to severe cases. This study focuses on evaluating the outcomes of physical extraction and its association with demographic and clinical variables among acne patients.

Materials and methods: A hospital based descriptive study was conducted among 110 respondents at Ad din Medical College and Hospital, between January to December 2024. Data were gathered through structured interviews and clinical records. Acne severity was graded into four categories. Associations between acne grades and variables such as gender, socioeconomic status, nutritional status (BMI) and duration of complete cure following physical treatment were analyzed using the chi-square test.

Results: Out of 110 respondents, males predominantly presented with lower acne grades, while females had higher severity (χ^2 =3.91, df=3, p<0.001). Socioeconomic status was strongly associated with acne grade (χ^2=85.5, df=6, p<0.001), with lower income groups more affected by higher grades. Nutritional status (BMI) also showed significant association, with overweight and obese individuals exhibiting more severe forms. Duration of complete cure after physical extraction varied significantly (χ^2=3.18, df=9, p<0.001), with those in higher acne grades requiring extended healing time.

Conclusion: This study highlights that physical extraction is an effective method in managing acne vulgaris, particularly when severity is influenced by gender, socioeconomic and nutritional factors. The findings support tailored treatment approaches based on individual clinical and demographic profiles to enhance outcomes.

Key words:

Introduction

Acne vulgaris is a prevalent inflammatory skin condition affecting approximately 80% of adolescents and young adults worldwide.[1-4] It primarily involves blockage and inflammation of the pilosebaceous units, presenting with lesions such as comedones, papules, pustules, and in severe cases, nodules or cysts.[2,3,5] Although acne is generally not life-threatening, it can result in permanent scarring and significant psychosocial distress, including reduced self-esteem, anxiety and depression.[1,5,6] The pathogenesis of acne is multifactorial, involving follicular hyperkeratinization, sebum overproduction, Propionibacterium acnes colonization, and inflammation.[2,7,5] Gender differences have been observed, with females often experiencing more severe inflammatory lesions due to hormonal fluctuations and cosmetic use.[7,6,8] Socioeconomic

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status and nutritional factors also influence acne prevalence and severity, with low-income and overweight/obese individuals more prone to severe disease.[9,10,4] Management strategies include pharmacological interventions such as topical retinoids, antibiotics, and systemic therapies, as well as physical treatment modalities like comedone extraction and incision and drainage for immediate lesion control.[11,12,5,13] Early mechanical intervention can accelerate clinical recovery, reduce lesion burden and prevent scarring, particularly in mild to moderate acne. [11,12,13] This study evaluates the efficacy of physical treatment modalities among urban patients and explores associations with demographic, nutritional and clinical variables.

Materials and methods

This hospital-based descriptive study was conducted in the Department of Dermatology at Ad-din Medical College and Hospital, Mogbazar, Dhaka, from January to December 2024. The study aimed to evaluate the efficacy of physical treatment modalities in acne vulgaris and to assess their association with selected sociodemographic and clinical variables among urban patients.

A total of 110 clinically diagnosed acne vulgaris patients attending the dermatology outpatient department were enrolled using purposive sampling. All participants were urban residents and provided informed consent prior to inclusion.

Inclusion criteria

Patients were included in the study if they met the following criteria:

- Clinically diagnosed cases of acne vulgaris (Grade 1 to Grade 4)
- Age ≥16 years
- Both male and female patients
- Urban residents attending the dermatology outpatient department
- Patients who received physical treatment modalities as part of acne management
- Willingness to participate and provide informed consent.

Exclusion criteria

Patients were excluded if they had:

- Acneiform eruptions due to drugs, cosmetics or endocrine disorders
- Active dermatological infections other than acne
- Severe systemic illness or immunocompromised status
- Pregnancy or lactation
- Current use of systemic isotretinoin or hormonal therapy
- Previous physical acne treatment within the last 3 months.

Acne Grading

Acne severity was classified clinically into four grades:

- Grade 1: Comedonal acne (Open and closed comedones)
- Grade 2: Papular inflammatory lesions
- Grade 3: Pustular lesions
- Grade 4: Nodulocystic acne with deep inflammatory lesions

Physical Treatment Modalities Used

The following physical treatment modalities were employed depending on acne severity:

- Comedone extraction using sterile comedone extractors (Primarily for Grade 1 and Grade 2 acne)
- Incision and drainage (I&D) for pustular and nodulocystic lesions (Grade 3 and Grade 4 acne)
- Aseptic technique was strictly followed in all procedures
- Physical procedures were performed at regular intervals alongside standard topical therapy when required.

Outcome Measures

The primary outcome was the duration of complete clinical cure following physical treatment, categorized as 3 months, 4 months, 5 months and >5 months. Secondary outcomes included associations between acne severity and gender, socioeconomic status, and nutritional status (BMI).

Data were collected through structured interviews and clinical record review. Statistical analysis was performed using SPSS. Associations were tested using the Chi-square test, with a p-value <0.05 considered statistically significant.

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Results

Table I Sociodemographic Characteristics

Variable	Frequency (n)	Acne Vulgaris Prevalence (%)
Total respondent	**110**	
Gender		
Female	63	57.3%
Male	47	42.7%
Age Group		
16-20 years	35	31.8%
21-25 years	27	24.5%
26- 30 years	16	14.5%
31-35 years	13	11.8%
36-40 years	12	10.9%
>40 years	7	6.4%
Education		
Secondary	30	27.3%
Higher Secondary	27	24.5%
Graduate	28	25.5%
Masters	25	22.7%
Occupation		
Employed	46	41.8%
Unemployed	64	58.2%
Socio-Economic Status		
Low	21	19.1%
Middle	54	49.1%
High	35	31.8%
Nutritional Status (BMI)		
Underweight (BMI < 18.5)	18	16.4%
Normal weight (BMI 18.5-24.9)	44	40.0%
Overweight/Obese (BMI 25)	48	43.6%

Table I describes a total of 110 individuals clinically diagnosed with acne vulgaris. Of these, a higher proportion were female (n=63, 57.3%) compared to male participants (n=47, 42.7%) indicating a greater representation of females in the study sample. Age-wise distribution revealed that the highest prevalence of acne was among participants aged 16-20 years 31.8%, followed by the 21-25 years age group 24.5%. A gradual decline in prevalence was observed with increasing age, with only 6.4% of respondents being above 40 years, suggesting that acne predominantly affects younger age groups but is not exclusive to adolescence. In terms of educational attainment, 27.3% of respondents had completed secondary education, 24.5% had higher secondary qualifications, 25.5% were graduates, and 22.7% had completed postgraduate (Master's level) education. This indicates a relatively well-educated study population. Regarding employment status, the majority of participants were unemployed 58.2%, while 41.8% were employed. The socioeconomic profile of the respondents showed that nearly half 49.1% belonged to the middle-income group, 31.8% were from high-income households and 19.1% were categorized under the low-income bracket, reflecting a socioeconomically diverse population. Nutritional status, evaluated using Body Mass Index (BMI) indicated that 43.6% of the participants were overweight or obese (BMI ≥ 25) 40.0% had normal BMI (18.5-24.9) and 16.4% were underweight (BMI < 18.5). This distribution suggests a potential influence of nutritional status on the severity and manifestation of acne vulgaris within the study population.

Table II Association between duration of complete cure and grades of acne vulgaris after physical extraction

Duration of Complete Cure after Physical Extraction	Grade- 1	Grade- 2	Grade- 3	Grade- 4	DF	Chi- squared	p value
3 months	24	3	1	0	9	3.18	<0.001
4 months	4	20	2	1			
5 months	0	4	24	2			
>5 months	0	0	3	22			

Table II describes the statistical analysis using the Chi-square test confirmed a significant association between acne severity and recovery time ($\chi^2 = 3.18$, df = 9, $p < 0.001$). These findings indicate that the severity of acne has a substantial impact on the effectiveness and duration of physical extraction therapy, with higher grades requiring a longer healing period.

Table III Association between grades of acne vulgaris with Gender

Gender	Grade- 1	Grade- 2	Grade- 3	Grade- 4	DF	Chi- squared	p value
Male	22	20	4	1	3	3.91	<0.001
Female	6	7	26	24			

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Table III describes a strong gender-based variation in the clinical presentation of acne vulgaris, with females disproportionately affected by higher severity grades. The statistically significant p-value (<0.001) reinforces the existence of a meaningful association between gender and acne severity in the study population.

Table IV Association between grades of acne vulgaris with socioeconomic status

Socioeconomic status	Grade-1	Grade-2	Grade-3	Grade-4	DF	Chi-squared	p value
Low	0	0	7	14	6	85.5	<0.001
Middle	10	15	20	9			
High	18	12	3	2			

Table IV describes a significant association between socioeconomic status and the severity of acne (χ^2 = 85.5, df = 6, p <0.001). Individuals from the low socioeconomic group predominantly exhibited higher grades of acne severity, with 14 participants classified as Grade 4 and 7 as Grade 3. Notably, no respondents from this group had mild acne (Grade 1 or Grade 2). In contrast, participants from the middle socioeconomic group showed a more balanced distribution across all acne grades, with cases present in Grade 1 through Grade 4, indicating varying severity within this category. Those from the high socioeconomic group mainly presented with milder forms of acne, with the majority categorized as Grade 1 (18 individuals) and Grade 2 (12 individuals). Severe acne cases (Grade 3 and Grade 4) were less frequent in this group. Overall, the data suggest that lower socioeconomic status is associated with more severe acne presentations, while higher socioeconomic status correlates with milder acne severity.

Table V Association between grades of acne vulgaris with Nutritional Status (BMI)

Nutritional Status	Grade-1	Grade-2	Grade-3	Grade-4	df	Chi-squared	p value
Underweight (BMI < 18.5)	12	5	1	0	6	33.52	<0.001
Normal weight (BMI 18.5-24.9)	10	15	12	7			
Overweight/ Obese (BMI ≥25)	6	7	17	18			

Table V describes a significant association between nutritional status, as determined by BMI and the severity of acne (χ^2 = 33.52, df = 6, p < 0.001). These findings suggest that increased BMI is associated with higher acne severity in the studied population.

Discussion

This study demonstrates that physical treatment modalities, particularly comedone extraction and incision and drainage, are effective in managing acne vulgaris, especially in mild to moderate cases. Patients with Grade 1 and Grade 2 acne experienced faster clinical recovery, often within three to four months, highlighting the effectiveness of early mechanical intervention. Physical extraction directly targets follicular obstruction by removing comedones and inflammatory contents, thereby reducing bacterial load and local inflammation.[11,12,13] Similar findings were reported by Zaenglein et al. who emphasized that comedone extraction accelerates lesion resolution when used as an adjunct to topical therapy.[7,11] In nodulocystic acne, incision and drainage provided symptomatic relief by reducing pain, pressure, and inflammatory burden, although prolonged healing time was observed. The longer duration of cure among Grade 3 and Grade 4 patients aligns with Kwon et al. who noted that deep inflammatory lesions often require combined approaches, including physical drainage and systemic therapy.[14,12,13] Gender differences observed in this study, with females exhibiting higher acne severity, may influence treatment response. Hormonal fluctuations, cosmetic use, and adherence to skincare practices have been reported to exacerbate inflammatory acne in females, increasing the need for repeated physical procedures.[7,6,8,5] Socioeconomic disparities significantly affected acne severity and outcomes. Patients from lower socioeconomic backgrounds presented with more severe acne and longer recovery durations, potentially due to delayed healthcare seeking and limited access to early treatment.[9,15,16,4] Nutritional status also influenced acne severity and treatment response. Overweight and obese patients exhibited more severe acne and extended recovery times, supporting evidence that metabolic and inflammatory pathways associated with adiposity may worsen acne pathogenesis.[17,18,10,5] These patients may benefit from combined physical, pharmacological and lifestyle interventions. Overall, our findings reinforce that physical treatment modalities are

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safe, effective, and valuable components of acne management, particularly when applied early and tailored according to severity.[11,12,5,4,13]

Conclusion

Physical treatment modalities, including comedone extraction and incision and drainage, are effective interventions in the management of acne vulgaris, particularly for mild to moderate cases. Acne severity, gender, socioeconomic status and nutritional condition significantly influence treatment outcomes and duration of recovery. Early application of physical procedures can reduce lesion severity, accelerate healing and potentially prevent scarring.

Recommendations

- Early physical intervention should be encouraged for Grade 1 and Grade 2 acne to shorten disease duration.
- Severe acne (Grade 3 and 4) should receive physical treatment as an adjunct to systemic or topical pharmacotherapy.
- Individualized treatment plans considering gender, BMI, and socioeconomic status are recommended.
- Public awareness programs should promote early dermatological consultation, especially among low socioeconomic groups.
- Further comparative and interventional studies with larger samples are recommended to assess long-term outcomes and scarring prevention.

Disclosure

All the authors declared no competing interest.

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Original Article

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Proportion of Dyslipidemia among Doctors Working in Rajshahi Medical College and Hospital

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Abstract

Background: Dyslipidemia is a major public health problem in developed and developing countries. This is associated with oxidative stress and also a common cause of Cardiovascular Disease (CVD) amounting to 30% of worldwide death rate. The main objective of this study was to find out the proportion of dyslipidemia among doctors working in Rajshahi Medical College and Hospital.

Materials and methods: A cross-sectional type of descriptive study was conducted in Physiology Department in collaboration with Biochemistry Department of Rajshahi Medical College, Rajshahi during period of January to December 2022. The sample size was 248 and purposive sampling technique was applied. Data were collected from the respondents through a semi-structured questionnaire after taking informed written consent.

Results: The study was carried out on doctors aged 25-60 years where 126 (50.80%) were female and 122 (49.20%) were male. Out of 248 respondents, 64.92% were dyslipidemic with the proportion of high TG level, high total cholesterol level, high LDL-cholesterol level and low HDL-cholesterol level was 43.15%, 28.23%, 29.44% and 52.82% respectively. Risk factors such as prehypertension, less physical exercise, overweight and family history of hypertension, diabetes mellitus, coronary heart disease were very common among the doctors.

Conclusions: The study showed that physicians had higher proportion of dyslipidemia. Among the participants, there was an unexpectedly low awareness rate.

Key words: Cholesterol; Dyslipidemia; HDL; LDL; Triglyceride.

Introduction

Dyslipidemia is either one or a combination of elevated total cholesterol, high LDL-C (Low Density Lipoprotein Cholesterol) low HDL-C (High Density Lipoprotein Cholesterol) and elevated triglyceride.[1] Dyslipidemia is more often secondary to other causes than a primary genetic defect. Even in patients with known genetic disorders, it is important to consider secondary factors that may affect lipid levels. These include obesity; lifestyle influences such as diet, exercise, smoking, and alcohol use, endocrine disorders such as diabetes mellitus and hypothyroidism and liver and renal diseases.[2]

The proportion of dyslipidemia varies geographically, although it has been estimated that more than 50% of adult population has dyslipidemia worldwide.[3] In a study on Bangladeshi adult, the proportion of elevated TG, TC, LDL and low HDL were 30.9%, 23.7%, 26.2%, 78.8% respectively. [4]

Dyslipidemia has a close link to the pathophysiology of CVD. It is a key modifiable risk factor for cardiovascular disease.[5] Atherosclerotic disorder such as coronary artery disease, cerebrovascular disease, peripheral vascular disease mostly occur due to hypercholesterolemia and fatty liver disease and acute pancreatitis may occur due to hypertriglyceridemia.[6] An observation has been done on epidemiological shift in the prevalence of dyslipidemia in developed countries compare to developing countries. Studies from

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Bangladesh and India have shown upward trend in the prevalence of dyslipidemia. Various factors are responsible for this rising trend as for example the development of rapid industrialization as a result there is changes in lifestyle pattern, work habit, diet and stress increased population and shrinking employment have been implicated.[7]

There was increase incidence of dyslipidemia among doctors had found in some study in current years. They lead a stressful life with sedentary lifestyle and lack of physical exercise falling them prey to lifestyle disorder.[8] Therefore, the current study had been made to assess the proportion of dyslipidemia among doctors of Rajshahi Medical College and Hospital. This research might be helpful for planning preventive measures, raising doctors awareness and promoting their well-being.

Materials and methods

This study was a cross sectional type of descriptive study. This study was conducted in the Department of Physiology, Rajshahi Medical College in collaboration with Department of Biochemistry, Rajshahi Medical College, Rajshahi during the period from January to December 2022. The study population was doctors aged 25 to 60 years working in Rajshahi Medical College and Hospital, Rajshahi. Doctors who are pregnant and not willing to take part in the study were excluded from the study. 248 respondents were included in this study by using purposive sampling technique. This study was approved by Institutional Review Board (IRB) and Ethical Review Committee (ERC) of Rajshahi Medical College, Rajshahi.

Overnight fasting blood sample was collected from median cubital vein in antecubital fossa by disposable syringe with all aseptic precautions. 2ml of serum was utilized for estimation of lipid profile. Plasma lipid was measured by enzymatic-colorimetric methods: Plasma total cholesterol was measured by CHOD-PAP method and triglyceride was measured by GPO-PAP method. The HDL-Cholesterol was measure by phosphotungstic-precipitation method. The Low-Density Lipoprotein (LDL) Cholesterol is calculated by the Friedewald equation.

Results

Table I Distribution of the respondents on the basis of dyslipidemia (n=248)

Dyslipidemia	Respondents (%)	
	Frequency	Percentage
Yes	161	64.92%
No	87	35.08%
Total	248	100.00%

Table I showed that, out of 248 respondents, 64.92% were dyslipidemic and 35.08% had normal lipid profile.

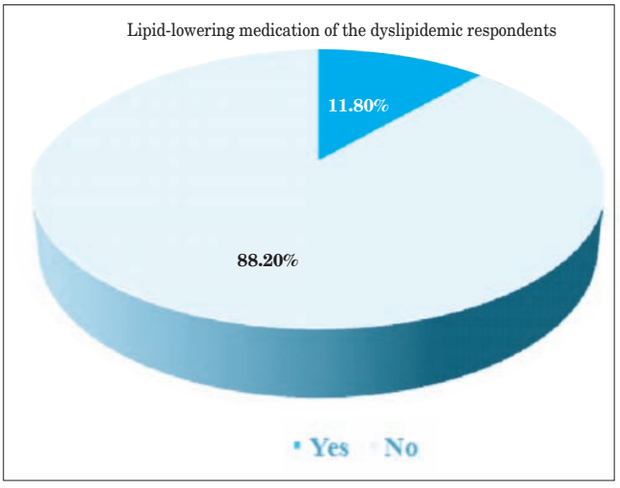

Figure 1 Distribution of the dyslipidemic respondents by lipid-lowering medication (n=161).

Out of 161 dyslipidemic respondents, 88.20% were not under lipid-lowering medication and remaining 11.80% were under lipid-lowering medication (Figure 1).

Table II Distribution of the respondents on the basis of serum TG, TC and LDL-cholesterol level (n=248)

Serum lipid	Category of respondents	Normal	Borderline High	High	Total
			Frequency (%)		
TG	Under lipid lowering agent	6 (31.58)	8 (42.10)	5 (26.32)	19 (100)
	Not under lipid lowering agent	141 (61.57)	59 (25.76)	29 (12.67)	229 (100)
TC	Under lipid lowering agent	14 (73.68)	5 (26.32)	0 (0)	19 (100)
	Not under lipid lowering agent	178 (77.73)	36 (15.72)	15 (6.55)	229 (100)
LDL-C	Under lipid lowering agent	17 (89.47)	2 (10.53)	0 (0)	19 (100)
	Not under lipid lowering agent	175 (76.42)	37 (16.16)	17 (7.42)	229 (100)

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Among the respondents who were under lipid lowering agents, 42.10%, 31.58%, 26.32% had borderline high, normal, high level of serum triglyceride respectively, 73.68% and 26.32% had normal and borderline high total cholesterol respectively and 89.47% and 10.53% had normal and borderline high LDL-cholesterol respectively. On the other hand, respondents who were not under lipid lowering agents, 61.57%, 25.76%, 12.67% had normal, borderline high, high level of serum triglyceride respectively, 77.73%, 15.72% and 6.55% had normal, borderline high and high level of total cholesterol respectively and 76.42%, 16.16% and 7.42% had normal, borderline high and high LDL-cholesterol respectively (Table II).

Table III Distribution of the respondents on the basis of alteration of serum TG, TC and LDL-cholesterol level (n=248)

Serum lipid	Frequency	Percentage (%)
Serum Triglyceride		
Hypertriglyceridemia	107	43.15
Normal triglyceride level	141	56.85
Total cholesterol		
Hypercholesterolemia	70	28.23
Normal cholesterol level	178	71.77
LDL-cholesterol		
High LDL-c level	73	29.44
Normal LDL-c level	175	70.56

Out of 248 respondents, 43.15% had Hypertriglyceridemia 29.44% had High LDL-c level and 28.23% had Hypercholesterolemia (Table III).

Table IV Distribution of the respondents on the basis of serum HDL-cholesterol level (n=248)

Category of respondents	Low	Normal	Total
Respondents under lipid lowering agent	8 (42.10%)	11 (57.90%)	19 (7.66%)
Respondents not under lipid lowering agent	112 (48.90%)	117 (51.10%)	229 (92.34%)
Overall	131 (52.82%)	117 (47.18%)	248 (100.00%)

Table IV showed the distribution of the respondents on the basis of serum HDL-cholesterol level. It was revealed that, respondents who were under lipid lowering agent, 57.90% had normal HDL level and 42.10% had low HDL level. Similarly, respondents who were not under lipid lowering agent, 51.10% had normal HDL level and 48.90% had low HDL level. As a whole, 47.18% had normal HDL level and 52.82% had low HDL level.

Discussion

The study was carried out on doctors aged 25-60 years where 126 (50.80%) were female, 122 (49.20%) were male, and had an average age of 35.06 ± 8.27 years. Most of the respondents, 219 (88.30%) were married, 28 (11.30%) were unmarried and only 01 (0.40%) was widow. Among the respondents, 49.20% were post-graduate trainee, 29.80% were post-graduation completed doctor and 21.00% were MBBS graduate doctor. In our study, 95.60% of the respondents lived in urban area, 4.00% lived in rural area and only 0.40% were from semi-urban area.

In this study, out of 248 respondents, 161 (64.92%) were dyslipidemic and 87 (35.08%) had normal lipid profile. Nearly similar finding was found in a study done in Northern Ethiopia where overall prevalence of dyslipidemia was 66.7%.[1] In another study in China found that the overall prevalence of dyslipidemia is 48.27% which finding was not similar with our study.[9] In this study, among 161 dyslipidemic respondents, 11.80% respondents were under lipid lowering medication and 88.20% were not under lipid lowering medication.

In the current study, out of 248 respondents, 229 respondents were not under lipid-lowering medication. Among them, 61.57%, 25.76%, 12.67% had normal, borderline high, high level of serum triglyceride respectively, 77.73%, 15.72% and 6.55% had normal, borderline high and high level of total cholesterol respectively, 76.42%, 16.16% and 7.42% had normal, borderline high and high LDL-cholesterol respectively, and 51.10% and 48.90% had normal and low HDL level respectively. On the other hand, 19 respondents were under lipid-lowering medication. Of them, 42.10%, 31.58%, 26.32% had borderline high, normal, high level of serum triglyceride respectively, 73.68% and 26.32% had normal and borderline high total cholesterol respectively, 89.47% and 10.53% had normal and borderline high LDL-cholesterol respectively and 57.90% and 42.10% had normal and low HDL level respectively.

In our study, 28.23% respondents had hypercholesterolemia and 43.15% had hypertriglyceridemia. Nearly similar findings were found in a study done in Northern Ethiopia where the elevated triglyceride and elevated total cholesterol were 40.2% and

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30.8%, respectively.[1] Another study in China reported that in their study, the prevalence of Hypercholesterolemia (HTC) and Hypertriglyceridemia (HTG) were 22.4% and 33.3% respectively.[9] But, other study done in India reported that 5% had hypercholesterolemia and 10.8% had hypertriglyceridemia which findings were contradictory with our findings.[10] Another study held in Jordanfound that the prevalence rates of hypercholesterolemia and hypertriglyceridemia were 44.3% and 41.9%, respectively.[11]

In the present study, 29.44% had high LDL cholesterol level and 52.82% had low HDL cholesterol level. Nearly similar findings were found in a study done in India where 36.6% had high LDL-cholesterol and 50.8% had low HDL-cholesterol level.[10] Dissimilar findings were found in a study done in Northern Ethiopia where prevalence of high Low-Density Lipoprotein Cholesterol (LDL-C) and low High-Density Lipoprotein Cholesterol (HDL-C) was 49.5% and 16.5% respectively.[1]Another study done in China reported that low High-Density Lipoprotein (HDL-C) and high Low-Density Lipoprotein (LDL-C) were 14.5% and 5.81% respectively, which were not similar with our study findings.[9] Another study held in Jordan found that the prevalence rates of high LDL and low HDL were 75.9% and 59.5% respectively, which findings were also far different from our findings.[11]

Study to study variations of dyslipidemia might be due to food habit, physical activity, self-awareness, socioeconomic status, urbanization and also for regional variations. These factors vary region to region in the world. Dyslipidemia is highly prevalent in developing countries. Individuals in the highest socio-economic category are the ones at higher risk for dyslipidemia. Unhealthy lifestyles (e.g. physical inactivity, less energy expenditure, irrational diet like energy-dense foods, refined carbohydrates, etc.) are more common in urban people which are associated with the risk of dyslipidemia.

Although awareness of lifestyle diseases was high among doctors, the study showed that physicians had higher proportion of dyslipidemia. Positive family history of diabetes, hypertension, dyslipidemia, cardiovascular disease and ischemic stroke were present in a large percentage of doctors.

Conclusion

In this study, the proportion of dyslipidemia was higher among doctors community of Rajshahi Medical College and Hospital, which would contribute in the future burden of CVD. Risk factors such as prehypertension, less physical exercise, overweight and family history of hypertension, diabetes mellitus, coronary heart disease were very common among the doctors.

Limitations

- This was a cross-sectional type of study in doctors community of Rajshahi Medical College and Hospital with comparatively small number of sample size. So, the study result may not reflect the exact scenarios of the whole country.
- Purposive sampling technique was selected. So, selection bias could not be avoided.

Recommendations

Based on study findings, the following recommendations are made:

- Further studies should be carried out to explore the burden of dyslipidemiaamong doctors using a large sample size.
- Doctors must be advised about healthy lifestyle modification such as quitting smoking, losing weight and engaging in regular physical exercise, healthy diet etc.
- Comparison of proportion dyslipidemiabetween doctors and non-medical professionals should be done.
- To assess cardiovascular risk among doctors other investigations (eg. Fasting blood glucose, HbA1c, ECG, Echocardiography) should be done.

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Disclosure

All the authors declared no competing interests.

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Original Article

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Clinical Correlates of the Respiratory Disturbance Index among Patients with Obstructive Sleep Apnea in a Tertiary Care Setting

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Abstract

Background: Obstructive Sleep Apnea (OSA) is the most common sleep-related breathing disorder and represents a major public health concern. It is characterized by recurrent upper airway obstruction during sleep, resulting in apnea, hypopnea, and related respiratory events. These events are quantified by the Respiratory Disturbance Index (RDI) using Polysomnography (PSG). Understanding the clinical factors associated with RDI in patients with OSA is essential for timely detection and prevention of its adverse health outcomes. This study aimed to evaluate the clinical characteristics of OSA patients and examine the association between clinical profile and RDI in a tertiary care hospital setting.

Materials and methods: This cross-sectional analytical study was conducted in the Department of Respiratory Medicine, Bangladesh Medical University (BMU) Dhaka. A total of 74 patients with OSA, selected according to predefined criteria, were enrolled. All participants provided informed written consent and underwent detailed clinical history taking, physical examination, and polysomnographic evaluation.

Results: The mean age of participants was 49.1 ± 13.5 years, with a male predominance (56.8%) and higher representation from urban areas (55.4%). Most participants were overweight or obese, with 33.8% classified as obesity class I. The Respiratory Disturbance Index (RDI) was not significantly associated with age, sex, smoking status or comorbidities. However, RDI showed a significant positive correlation with body mass index ($r = 0.310$, $p = 0.007$) and systolic blood pressure ($r = 0.290$, $p = 0.012$). Multivariate regression confirmed systolic blood pressure as an independent predictor of high RDI (OR: 1.079, 95% CI: 1.014–1.149, $p = 0.017$). Current smoking was reported in 35.1% of patients, while obesity was highly prevalent, particularly class I obesity (33.8%). A significant association was observed between RDI and systolic blood pressure: patients with RDI ≥30 had higher mean systolic blood pressure (136.7 mmHg) compared to those with RDI <30 (127.8 mmHg, $p = 0.002$).

Conclusion: The study found that systolic blood pressure was a significant predictor of disease severity, which underscore the importance of routine screening for OSA among patients with obesity and elevated systolic blood pressure to enable early recognition and management.

Key words: Obstructive sleep apnea; respiratory disturbance index; polysomnography; metabolic health; hypertension.

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Introduction

OSA is a common sleep-related breathing disorder characterized by repetitive obstruction of the upper airway during sleep, leading to episodes of hypopnea (Reduced airflow) or apnea (Complete cessation of airflow).[1] Patients often present with symptoms such as loud snoring, recurrent nocturnal arousals, sleep fragmentation, and excessive daytime sleepiness, features that together define the Obstructive Sleep Apnea Syndrome (OSAS).[2]

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Pathophysiologically, recurrent airway obstruction results in reduced or absent airflow, culminating in alveolar hypoventilation, oxyhaemoglobin desaturation and in more prolonged cases, hypercapnia. These events provoke central nervous system activation, leading to micro-arousals and sleep fragmentation, the key drivers of excessive daytime somnolence. Intermittent hypoxia further activates arterial chemoreceptors, augmenting sympathetic nervous system activity. This cyclical pattern of hypoxia and reoxygenation not only impairs restorative sleep but also contributes to heightened sympathetic drive, oxidative stress, and systemic inflammation.[3]

Epidemiological studies highlight the growing global burden of OSA. Prevalence rates vary across populations, with estimates of 32.5% in India, 34% of men and 17% of women aged 30–70 years in China and 33.9% of men and 17.4% of women in the United.[4-6] South Korea has reported a prevalence of 15.8% among adults.[7] In Bangladesh, the first population-based survey conducted between 2007 and 2008 reported an overall prevalence of 11.9% for Obstructive Sleep Apnea–Hypopnea (OSAH) and 3.29% for OSAS, with higher rates observed among men (17.37% for OSAH and 4.49% for OSAS) compared to women (6.25% and 2.14%, respectively).[8] A recent global meta-analysis estimated the pooled prevalence of OSA at 35.9%.[9]

OSA severity is frequently classified using the RDI, defined as the average number of apneas, hypopneas and respiratory effort-related arousals per hour of sleep. Commonly used thresholds categorize OSA into no OSA (RDI < 5 events/h), mild OSA (RDI 5–14 events/h) moderate OSA (RDI 15–29 events/h) and severe OSA (RDI 30 events/h).[10] The clinical profile of OSA patients, including demographic, lifestyle and comorbidity characteristics, therefore plays an important role in evaluating disease severity and guiding clinical management. The aim of the present study wasto evaluate if clinical characteristics correlates with the severity of OSA. The null hypothesis was that no correlation exists between the selected variables.

Materials and methods

This cross-sectional analytical study was carried out over 12 months in the Sleep Clinic, Sleep Study Laboratory and Department of Respiratory Medicine at Bangladesh Medical University (BMU) Dhaka. Ethical approval was secured from the Institutional Review Board of Bangabandhu Sheikh Mujib Medical University (Memo No. BSMMU/2023/14063, Date: 16-11-2023).Written informed consent was obtained from each participant following explanation of study objectives and procedures.

Patients aged 18 years and above with a diagnosis of OSA confirmed by in-laboratory PSG were eligible. Exclusion criteria included pregnancy, prior treatment with Continuous Positive Airway Pressure (CPAP) or oral appliances and critical illness such as acute coronary syndrome, respiratory failure or acute stroke. A non-probability consecutive sampling method was used.The minimum required sample size was estimated using Green's formula for multivariate regression analysis ($n \geq 50 + 8m$) which yielded a target of 90 participants for five predictors (Age, BMI, respiratory disturbance index, hypertension and diabetes mellitus).[11] Due to temporary interruptions in sleep testing facilities, 74 patients were ultimately enrolled.

Sociodemographic and clinical data were obtained using a structured, interviewer-administered questionnaire. Height, weight and blood pressure were measured and smoking status was classified according to CDC criteria. Hypertension and diabetes mellitus were identified by physician diagnosis or ongoing treatment. The RDI was derived from PSG following standard scoring guidelines.[10]

All data were analyzed using SPSS version 26.0 (IBM Corp. Chicago, IL, USA). Categorical variables were presented as frequencies and percentages, while continuous variables were summarized as mean ± standard deviation or median with interquartile range, depending on distribution. Group comparisons were performed using the independent-samples t-test for continuous variables and the Chi-square test for categorical variables. Associations between the Respiratory Disturbance Index (RDI) and clinical variables were assessed using Pearson's correlation coefficient and simple linear regression. Variables with a p-value <0.20 in bivariate analyses were included in a multivariate regression model to identify independent predictors of elevated RDI. Results were reported as Odds Ratios (ORs) with 95% Confidence Intervals (CIs). A p-value <0.05 was considered statistically significant.

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Results

Table I presents the demographic and clinical characteristics of the study participants (n = 74). The mean age of the cohort was 49.1 ± 13.5 years (Range: 18–80) with the largest proportion in the 40–49 years age group (28.4%). Males comprised 56.8% of the participants, resulting in a male-to-female ratio of approximately 1.3:1. A slightly higher proportion of individuals resided in urban areas (55.4%) compared to rural areas (44.6%).

With respect to lifestyle factors, 41.9% of participants reported being current smokers, while 58.1% were non-smokers. Analysis of Body Mass Index (BMI) indicated that most participants were overweight or obese, with 33.8% in obesity class I, 14.9% in class II, and 20.3% in class III. Only 9.5% had a BMI within the normal range.Regarding comorbidities, hypertension was present in 45.9% and diabetes mellitus in 36.5% of participants. The mean Systolic Blood Pressure (SBP) was 132.1 ± 12.6 mmHg (Range: 100–160 mmHg), while the mean Diastolic Blood Pressure (DBP) was 77.6 ± 8.61 mmHg (range: 60–100 mmHg).

Table I Demographic and clinical characteristics of the participants (n = 74)

Characteristics	Frequency	Percentage (%)
Age group (Years)		
<30	5	6.8
30-39	13	17.6
40-49	21	28.4
50-59	16	21.6
60-69	13	17.6
70-80	6	8.1
Gender		
Male	42	56.8
Female	32	43.2
Residence		
Rural	33	44.6
Urban	41	55.4
Smoking status		
Smoker	31	41.9
Non- smoker	43	58.1
Body mass index		
Normal (18.5-24.9)	7	9.5
Overweight (25.0-29.9)	16	21.6
Obesity class I (30-34.9)	25	33.8
Obesity class II (35-39.9)	11	14.9
Obesity class III (>40)	15	20.3
Comorbidity		
Hypertension	34	25.9
Diabetes mellitus	27	36.5

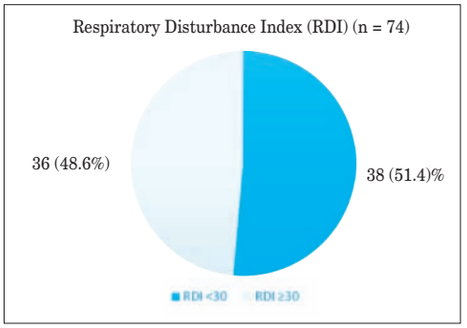

Figure 1 Severity category of the OSA patients by RDI

In this study, 38 participants (51.4%) have an RDI of less than 30, while 36 participants (48.6%) have an RDI of 30 and above (Figure 1).

Table II shows the association between RDI and demographic and clinical characteristics of the participants. The mean age did not differ significantly between groups with RDI <30 and RDI ≥30 (47.9 ± 13.2 vs. 50.3 ± 13.9 years; p = 0.447). Although males were more frequent in the higher RDI group (66.7% vs. 47.4%) the difference was not statistically significant (p = 0.094). Similarly, smoking status, hypertension, and diabetes mellitus were more common in participants with RDI 30, but these differences did not reach statistical significance.BMI was higher among participants with severe OSA (34.8 ± 7.2 kg/m² vs. 32.1 ± 6.3 kg/m², p = 0.091) though the difference was not significant. Importantly, systolic blood pressure was significantly higher in the RDI 30 group compared to the RDI <30 group (136.7 ± 10.7 vs. 127.8 ± 12.8 mmHg, p = 0.002). Diastolic blood pressure did not differ significantly between groups (p = 0.346).

Table II Association of RDI with demographic and clinical characteristics (n = 74)

Characteristics	Respiratory disturbance index		p-value
	<30(n = 38)	≥30(n = 36)	
Age group (Years)	47.9±13.18	50.3±13.9	0.447*
Sex Male	18(47.4%)	24(66.7%)	0.094†
Female	20(52.6%)	12(33.3%)	
Smoking status			
Smoker	14 (36.8)	17 (47.2)	0.366†
Non- smoker	24 (63.2)	19 (52.8)	
Comorbidity			
Hypertension	14(36.8%)	20(55.6%)	0.105†
Diabetes mellitus	10(26.3%)	17(47.2%)	0.062†
Body mass index (kg/m^2)	32.1±6.33	34.8±7.22	0.091†
Systolic blood pressure	127.8±12.8	136.7±10.7	0.002*
Diastolic blood pressure	76.7±8.24	78.6±8.99	0.346*

Data were expressed as mean±SD or frequency (%)
*Unpaired t-test †Chi-square test.

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Table III presents the correlation of RDI with age, BMI, and blood pressure among the participants (n = 74). No significant correlation was found between RDI and age (r = –0.026, p = 0.826) or DBP (r = +0.053, p = 0.654). In contrast, RDI showed a significant positive correlation with BMI (r = +0.310, p = 0.007) and SBP (r = +0.290, p = 0.012).

Table III Correlation of RDI with age, BMI and blood pressure (n = 74)

Variables	Pearson's correlation test	
	Rvalue	p-value
Age (Years)	-0.026	0.826
BMI (kg/m^2)	+0.310**	0.007
Systolic blood pressure (mm of Hg)	+0.290*	0.012
Diastolic blood pressure (mm of Hg)	+0.053	0.654

Table IV shows the results of multivariate regression analysis to identify predictors of high RDI. Among the studied variables, SBP emerged as a significant predictor, with each 1 mmHg increase in SBP associated with a 7.9% higher odds of having elevated RDI (OR: 1.079, 95% CI: 1.014–1.149, p = 0.017). Body Mass Index (BMI) showed a positive trend (OR: 1.063, p = 0.110) though it did not reach statistical significance. Diastolic Blood Pressure (DBP) hypertension and diabetes mellitus were not significant predictors of RDI in this cohort.

Table IV Multivariate regression analysis for predictors of high Respiratory Disturbance Index (RDI) among participants (n = 74)

Variables	B	Odds Ratio (OR)	95% CI for OR	p-value
BMI (kg/m^2)	0.061	1.063	0.986 – 1.146	0.110
SBP (mmHg)	0.076	1.079	1.014 – 1.149	0.017
DBP (mmHg)	-0.035	0.966	0.899 – 1.038	0.346
Hypertension	-0.179	0.836	0.244 – 2.858	0.775
Diabetes Mellitus	0.358	1.431	0.439 – 4.663	0.552

BMI: Body Mass Index, SBP: Systolic Blood Pressure
DBP: Diastolic Blood Pressure.

Discussion

This study examined the clinical profile of patients with OSA attending a tertiary care centre in Bangladesh, with particular emphasis on demographic and lifestyle factors in relation to disease severity, as measured by the RDI. The mean age of participants was 49.1 years, with the largest proportion in the 40–49-year age group. This is consistent with previous studies that reported OSA as most prevalent in middle-aged and older populations.[8,12] The slightly higher mean age in the present cohort compared to earlier Bangladeshi findings may reflect regional or population-specific variations but overall, the age distribution reinforces the importance of screening middle-aged adults, who represent the group most at risk.

Gender distribution in this study showed a male predominance (56.8%), producing a male-to-female ratio of 1.3:1. This finding is comparable with earlier Bangladeshi data, although it differs from Zhou et al. who reported a higher male predominance (77.2%).[8,13] The closer gender balance observed in the present study suggests that OSA is increasingly recognized among females in this setting, possibly due to greater awareness, changing health-seeking behaviours, or hormonal and body composition influences that affect OSA risk in women.

Smoking was reported in 35.1% of participants, aligning with earlier studies that found no consistent association between smoking and OSA severity.[14,15] While smoking is an established risk factor for upper airway inflammation, its role as an independent determinant of OSA remains uncertain. The present findings, which showed a predominance of non-smokers, suggest that smoking is not a primary driver of OSA in this population, though its role in disease progression cannot be excluded.

Obesity emerged as a prominent clinical feature, with the majority of participants falling into overweight or obese categories, and a mean BMI of 33.4 kg/m^2. This is consistent with global evidence demonstrating obesity as the most important risk factor for OSA.[16,17] Although the difference in BMI between severe and non-severe OSA groups did not reach statistical significance, a clear trend of higher RDI values among individuals with higher BMI categories was observed, reinforcing the established link between obesity and OSA severity.

A significant finding of this study was the strong association between SBP and RDI. Patients with severe OSA (RDI ≥30) had significantly higher mean SBP compared to those with milder disease, and multivariate regression confirmed SBP as an independent predictor of OSA severity. This result is consistent with previous research indicating that

OSA contributes to the development and progression of hypertension, particularly systolic hypertension, through mechanisms such as sympathetic nervous system activation, intermittent hypoxia and endothelial dysfunction.[14,17] Interestingly, DBP was not significantly associated with RDI, echoing reports that OSA exerts a stronger effect on systolic rather than diastolic pressure.[18]

Limitations

The present study was limited by its relatively small sample size of 74 participants, which fell short of the calculated requirement and may restrict the generalizability of the findings. The cross-sectional design also prevented the establishment of causal relationships between clinical factors and OSA severity. In addition, reliance on self-reported information such as smoking status could have introduced recall or reporting bias. Finally, unmeasured confounders, including lifestyle, diet, physical activity and medication usemay have influenced the observed associations.

Conclusion

In conclusion, this study identified a characteristic clinical profile of OSA patients in Bangladesh, marked by middle age, male predominance and a high prevalence of obesity. While age, sex, smoking, and comorbidities such as hypertension and diabetes mellitus were not independently associated with RDI, SBP was significantly correlated with OSA severity and remained an independent predictor in multivariate analysis. These findings reinforce the central role of obesity and elevated blood pressure in the progression of OSA.

Recommendations

Routine screening for OSA should be prioritized among middle-aged, overweight or obese adults, particularly those with hypertension. Clinical services should incorporate weight management and blood pressure monitoring into the assessment and care of OSA patients. Larger, longitudinal studies are recommended to better establish causal pathways and clarify the contribution of lifestyle and environmental factors to OSA severity.

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Disclosure

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Original Article

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Pattern of Nosocomial Infections in ICU Patients

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Abstract

Introduction: Nosocomial Infections (NI) affect about 20-30% of patients in intensive-care units and are associated with substantial morbidity and mortality. The aim of this study was to know the rates and pattern of NI in patients admitted into the ICU.

Materials and methods: Present study was conducted in the ICU of a tertiary care hospital of Chattogram during the period January to December 2014 among 50 admitted patients. All the patients were studied since 2 days after they were admitted by the researcher. Clinical examination was done and laboratory evaluation was also done to find the types, site and pattern of NI. After collection of all data it was analyzed by SPSS-18.

Results: The frequency of NI among the ICU patients in the allocated time period (one year) among the total 50 patients was found 26%. Among the 13 patients who acquired nosocomial infections: 6(46.1%) had pneumonia, 3(23.1%) had UTI, 1(7.7%) had SSTI, 1(7.7%) had BSI, 1(7.7%) had UTI+SSTI and 1(7.7%) BSI+SSTI. Common organism was E coli, Coliform bacteria, Acenobactor, Staphylococcus, Klebciella and pseudomonas.

Conclusions: Compared to the data for device-associated infections in the different studies, our results are in concordance except for Ventilator Associated Pneumonia (VAP) where our rate is higher. Even so the target for preventing VAP in the ICU of our hospital must be the group of patients who will be selected for intubation.

Key words: ICU; Nosocomial infection; Prevalence.

Introduction

Infection acquired during hospital stay are generally called Nosocomial Infection (NCI). Formerly NCI was defined as infections arising after 48 hours of hospital admission. In the year 1994, the National Nosocomial Infection Surveillance System (NNIS) USA, formulated a standardized reporting system to monitor hospital acquired infection for the guidance of medical practitioners to prevent and minimize the occurrence of such infections. NNIS defines a nosocomial infection as a localized or systemic condition that results from adverse reaction to the presence of an infectious agent (s) or its toxin(s) that was not present or incubating at the time of admission to the hospital.[1,2] As incubation period varies with the type of pathogen and patient's underlying condition, each infection must be assessed individually. It may be born in mind that there are two other special situation in which an infection is considered to be nosocomial i) infection that is acquired in the hospital, but does not become evident until hospital discharge ii) infection in a neonate that results from passage through birth canal.

There are two special situations in which an infection is not considered nosocomial: a) Infection that is associated with a complication or extension of infection already present on admission, unless a change in pathogen or symptoms strongly suggests the acquisition of new infection b) In an infant, an infection that is known or proved to have been acquired trans placentally (e.g. toxoplasmosis, rubella, cytomegalovirus or syphilis) and become evident at or before 48 hours after birth.

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There are two conditions that are not infection: i) Colonization, which is the presence of microorganisms (On skin, mucous membranes, in open wounds, or in excretion or secretion) that are not causing adverse clinical signs and symptoms ii) inflammation, which is a condition that results from tissue response to injury or stimulation by noninfectious agents such as chemicals.

The patients that are admitted in the ICU most of them have defective host defenses that compromise their ability to ward off infectious agents. Factors which influence immunocompetences are immune senescence, changes in nonadaptive immunity, chronic diseases, medications, malnutrition and functional impairment. T- lymphocyte production and proliferation decline with age, which results in decreased cell mediated immunity and decreased antibody production to new antigens. Chronic disease such as cancer, malnutrition, atherosclerosis, diabetes mellitus and dementia predispose to certain types of infection. Medications such as sedatives, narcotics, anticholenergics and gastric acid suppressants may further decrease inner defense. Malnutrition reduces cell mediated immunity and is common in our country. In addition to these functional impairment that necessitate the use of urinary catheter, feeding tube and other invasive devices enhancing susceptibility to nosocomial infection.[3]

There has been tremendous increase in elderly population and end stage diseases due to improvement in health care facility throughout the world. In view of this, there is an urgent need to focus our attention to problems of ICU patients, especially infections among ICU admissions. According to published literature, the most prevalent nosocomial infections in among ICU admission are urinary tract infection, pneumonia, bloodstream infections, skin and soft tissue infection, gastroenteritis, hepatitis and central nervous system infections like meningitis.[4,5,6] Thus the aim of the study was to know the rates and pattern of NI in patients admitted in to the ICU.

Materials and methods

It is a cross sectional observational study done in a Intensive Care Unit of a tertiary care Government Hospital of Chattogram during a one year study period from January to December 2014. All patients admitted in the ICU ward for more than 48 hours were included as study population and sampling technique was purposive any patient admitted with documented infection and patients who not given consent were excluded. Patients having evidence of nosocomial infection were evaluated thoroughly by the researcher himself and a set of laboratory investigations were done to find causative agent and site of infection. The ICU at the study hospital receives patients of all discipline. The Physician : Patient ratio is 1:3 and the Nurse: Patient ratio is 1:2 during the day shift (8 h). Both Physician: Patient and Nurse: Patient ratios are 1:6 at other times. Care is provided primarily by Anaestesiologist and Internists. When required, consultation is available from respective departments. Culture was done in different medias like (Blood agar media: Oxoid UK, Mac Conkey's Agar Media: Oxoid UK, Mueller Hinton Agar Media, Oxoid UK and were performed routinely for aerobic organisms in the Department of Microbiology, Chittagong Medical College. Following antibiotic disc were used for sensitivity like Ciprofloxacine, Ceftriaxone, Cefixime, Ceftazidime, Amikacin, Vancomycin, Oxacillin, Azithromycin, Co-trimoxazole, Gentamycin, Cefuroxime and all the disc were from Oxide Company, UK.The study involved all patients who were hospitalized in the ICU for more than 48 h. Patients who died within the rst 48-h period or whose length of ICU stay was less than 48 h were excluded from the study. Upon admission to the ICU, patients underwent physical examination and laboratory studies. The presence or absence of community-acquired and nosocomial infections on admission to the ICU was recorded on predesigned case record form. The patients were surveyed prospectively for ICU-acquired infection by the researcher himself during daily visits. Physical examination and laboratory ndings, invasive procedures and treatment modalities were recorded on each patient's case record form. To determine whether any signs or symptoms of nosocomial infection had developed since they had been hospitalized in the ICU.In suspected cases of VAP a portable chest X-ray was done and pneumonia was confirmed as per operational definition. Sputum was collected by sterile swab stick from the throat and Gram stain and culture was done. Suspected UTI was confirmed by urine CS. Urine was collected from the tube and not from the urine bag to avoid contamination. Blood culture was done after collection in FAN method. Skin and soft tissue infection was also diagnosed by pus study for Gram staining and culture

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All relevant information for each individual study subject was recorded after getting informed written consent from the patients or from their legal guardians on a pre- tested data sheet. Data was collected by the researcher himself. Data was processed and analyzed by using computer based software SPSS-22. Different statistical method were applied for data analysis. P value considered as statistically significant when it is less than 0.05.

Results

Of the 50 patients most of the patients were found in the age group 20 to 39 years which was 50%. Patients of extremes of age were minimum(10% and 6%). Mean ± SD of age was 31.44 ±19.53 years. Among the 50 patients 16(32%) were female and 34(68%) were male. Male to female ratio was 2.1: 1.

Table I Distribution of age and sex (n = 50)

		Frequency	Percentage (%)
Age in Groups	< 10 Years	05	10.0
	10 – 19 Years	05	10.0
	20 – 29 Years	19	38.0
	30 – 39 Years	06	12.0
	40 – 49 Years	03	6.0
	50 – 59 Years	05	10.0
	60 – 69 Years	04	8.0
	≥ 70 Years	03	6.0
Gender	Male	34	68
	Female	16	32
Total		50	100.0

Among the 13 patients who had nosocomial infection 6(46%) patients had pneumonia, 3(23.1%) had Urinary Tract Infection (UTI) 1(7.7%) had Skin and Soft Tissue Infection (SSTI) 1(7.7%) had blood stream infection (BSI) UTI + SSTI was found in 1(7.7%) and pneumonia and SSTI was also found in 1(7.7%).

Table II Distribution of types of nosocomial infections (n = 13)

Types of Nosocomial Infections	Frequency	Percentage (%)
Pneumonia (PNEU)	06	46.1
Urinary Tract Infection (UTI)	03	23.1
Skin & Soft Tissue Infection (SSTI)	01	7.7
Blood Stream Infection (BSI)	01	7.7
UTI + SSTI	01	7.7
PNEU + SSTI	01	7.7
Total	13	100.0

Mean ± SD of admission to survey day was 29.92 ± 21.58 days for the patients who had suffered from nosocomial infection.

Table III Statistics of admission to survey day interval according to types of nosocomial infections (n = 13)

	Nosocomial Infections	N	MEAN	± SD	MEDIAN	RANGE
Admission to Survey Day Interval (Days)	Pneumonia	06	21.33	9.89	21.00	7 – 34
	Urinary Tract Infection	03	33.33	25.66	40.00	5 – 55
	Skin & Soft Tissue Infection	01	45.00	-	45.00	-
	Blood Stream Infection	01	80.00	-	80.00	-
	UTI + SSTI	01	6.00	-	6.00	-
	SSTI + PNEU	01	30.00	-	30.00	-
	TOTAL	13	29.92	21.58	30.00	5 – 80

Acenobactor and coliform bacteria were found in sputum culture, E coli was found in urine culture, E coli and Staphylococcus were found in skin and soft tissue infection.

Table IV Pattern of organism in different infection

Types of Nosocomial Infections	Common organism	Number
Pneumonia (PNEU)	Acenobactor	04
	Coliform bacteria	02
Urinary Tract Infection (UTI)	E. coli	03
Skin & Soft Tissue Infection (SSTI)	E. coli,	01
Staphylococcus Blood Stream Infection (BSI)	Coliform organism	01
UTI + SSTI	E coli, Staphylocccus	01
PNEU + SSTI	Acenobacor, Coliform bacteria	01

Of the 50 patients the most frequent diagnosis was neurological diseases 19(38%) next to which were Gynae and Obstretical diseases 18%, Respiratory diseases 16%, Surgical diseases (14%) cardiovascular diseases (10%) and hepatorenal diseases (4%).

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Table V Distribution of diagnoses on admission (n = 50)

Diagnosis on Admission		Frequency	Percentage (%)
Neurological Diseases	Stroke (8) SAH (4) GBS (3) Head injury (4)	19	38.0
Gynae & Obst Diseases	LSCS	09	18.0
Respiratory Diseases	COPD (5) Pneumonia (3)	08	16.0
Surgical Diseases	Laparotomy (5) Malignancy (3)	07	14.0
Cardiovascular Diseases	MI (3) Heart failure (2)	05	10.0
Hepato-renal Diseases	CLD	02	4.0
Total		50	100.0

Among the 50 patients no patients were found to having central venous catheter. 100% patients were bearing peripheral venous catheter. 100% patients also had indwelling urinary catheter. 8(16%) patients had surgical drain and 18(36%) patients were intubated.

Table VI Distribution of instrumentations within ICU (n = 50)

Instrumentations		Frequency	Percentage (%)
Central Venous Catheter	Present	00	0.0
	Absent	50	100.0
IV line(Peripheral Venous Channel)	Present	50	100.0
	Absent	00	0.0
Urinary Catheter (> 24 Hours)	Present	50	100.0
	Absent	00	0.0
Surgical Drain	Present	08	16.0
	Absent	42	84.0
Intubation	Present	18	36.0
	Absent	32	64.0
Total		50	100.0

Discussion

Nosocomial infection in Intensive Care Units (ICUs) is associated with increased morbidity, mortality and hospital costs[6]Several risk factors affecting ICU mortality other than nosocomial infection have been reported, such as diagnosis on admission, invasive procedures and treatments, severity of illness scores and the length of ICU stay. The incidence of nosocomial infection varies according to the setting (The type of hospital or ICU) the population of the patients and the precise de nition used.

In the present study among 50 patients most of the patients were found in the age group 20 to 39 years which was 50%. Patients of extremes of age were minimum (10% and 6%). Mean ± SD of age was 31.44 ±19.53 years. Among the 50 patients 16(32%) were female and 34(68%) were male. Male to female ratio was 2.1: 1. Previous study done in India found average age group in their center was around 35 years which was consistent with our study also.[7] Again This present data may not represent the actual population scenario Bangladesh as data is taken purposively from single center with small sample size.

The overall prevalence of nosocomial infection was found 26% out of 50 study patients. This prevalence rate is consistent with the study done in abroad.[4] A study was done to sought to determine the rate of Healthcare-Associated Infection (HCAI) microbiological pro le, bacterial resistance, Length Of Stay (LOS) and excess mortality in 12 ICUs of the seven hospital members of the International Infection Control Consortium (INICC) of seven Indian cities.[12] Prospective surveillance was introduced from July 2004 to March 2007, 10 835 patients hospitalized for 52 518 days acquired 476 HCAIs, an overall rate of 4.4% and 9.06 HCAIs per 1000 ICU-days. The Central Venous Catheter-Related Bloodstream Infection (CVC-BSI) rate was 7.92 per 1000 catheter-days, the Ventilator-Associated Pneumonia (VAP) rate was 10.46 per 1000 ventilator-days and the Catheter-Associated Urinary Tract Infection (CAUTI) rate was 1.41 per 1000 catheter-days. In the present study, of the 50 patients the most frequent diagnosis was neurological diseases 19(38%) next to which were Gynae and Obstretical diseases 18%, Respiratory diseases 16%, Surgical diseases(14%) cardiovascular diseases (10%) and hepatorenal diseases (4%). This findings are also consistent with the present study.

In the present study most common infections were pneumonia.The most common underlying diseases were heart failure and diabetes mellitus. In our study, the overall rate of ICU-acquired infection

was 88.9/100 patients and 84.2/1000 patient-days. In a study performed at a 10-bed neurology ICU in Germany, the rate of nosocomial infection was reported as 24.3/100 patients and 25.0/1000 patient-days.

In another study from Germany, periodic surveillance of nosocomial infection in two neurology ICUs revealed 63 nosocomial infections in 51 of 340 patients over the study period.[9]

In a retrospective study from Austria, nosocomial infections were observed in 20% of patients admitted to a ICU, while in a study from India, the nosocomial infection rate in a neurology/ neurosurgery ICU was reported to be 39%.[10]

The different prevalence in our study may be due to the inadequate level of care in our neurology ICU. The nurse: Patient ratio in our ICU is lower than has been recommended. pneumonia (46.1%) urinary tract infections (23.1%) and primary bloodstream infections (7.7%) were the three most common types of infection in our study. In the study from Germany, pneumonia (11.7%) urinary tract infections (8.7%) and primary bloodstream infections (1.4%) were reported as the three most common infections. Pneumonia (34%) urinary tract infection (28%) and sepsis (10%) were the most common site-speci c infections reported from India.[11,12]

Another study performed in a neurology ICU in Austria reported rates of nosocomial bacteraemia, pneumonia and urinary tract infection as 37.3%, 27.4% and 25.5%, respectively.[10]

Although the incidence of urinary tract infections and catheter-related infections might be similar to those in other ICUs, comatose patients may be at a greater risk of nosocomial pneumonia.

Age of the patients also in uenced nosocomial infection, the higher the age and the more was the nosocomial infection. It might be due to decreased resistance to infections in aged patients.

In the present study 50 patients were included where male was 34(68%) and female was 16(32%). Mean ± SD of age was 31.44 ± 19.53. This male female difference may be due to less admission of female in ICU due financial and other socio-cultural cause. Age distribution of patients was might be due to lack of ICU facilities for neonate and children.

Mean hospital stay was also related with prevalence of infection in the ICU setting found in our study. Common ICU infections was found in the patients who stayed longer in the ICU. It might be due to more exposure to instruments and machineries which might be the cause of the nosocomial infection.

Limitation

- Small sample size
- Lack of long term follow up
- As sampling were cross sectional it may not show the actual conditions of national scenario of Bangladesh.
- There may be some assay related pitfalls as they were done by the private laboratories.

Conclusions

Nosocomial infection was found common in ICU setting in our country. Ventilator associated pneumonia and urinary tract infection are two common clinical problems which was found most. So multidisciplinary, healthcare professionals are needed to avoid nosocomial infection.

Disclosure

The authors declared no conflicts of interest.

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Case Report

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Rowell's Syndrome in a Middle-Aged Woman: A Case Report

Shamim Ara[1*] Mansurul Alam[2]

Abstract

Rowell's Syndrome (RS) is an uncommon presentation of Lupus Erythematosus (LE) characterized by Erythema Multiforme (EM) like lesions and distinctive serological abnormalities. The condition occurs predominantly in middle-aged women. Therapeutic options include corticosteroids, Hydroxychloroquine (HCQ) immunosuppressive agents and biologics used for Systemic Lupus Erythematosus (SLE). The authors describe the case of a 38-year-old woman with known SLE who developed EM-like lesions consistent with Rowell's syndrome and responded well to systemic corticosteroids and hydroxychloroquine.

Key words: Erythema multiforme; Lupus erythematosus; Rowell syndrome.

Introduction

Rowell's Syndrome (RS) is a rare clinical entity, characterized by the coexistence of Lupus Erythematosus (LE) with Erythema Multiforme (EM) like lesions and specific immunologic findings. This association was first described in 1922 but was formally defined as RS by Rowell et al. in 1963.[1-4] Approximately 95 cases have been reported globally, with a strong female predominance (Female-to-male ratio of 3:1 before puberty and 9:1 after puberty) and an average onset age of 32 years.[4,5] The authors describea case of RS in a 38-year-old woman with previously diagnosed SLE who presented with EM-like lesions fulfilling the diagnostic criteria for Rowell's syndrome.[6]

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Case Presentation

Mrs. 'S' a 38-year-old woman from Rangamati, presented to the Dermatology Outpatient Department of Chattagram International Medical College Hospital on 10th October 2025 with a 10-day history of painful, pruritic, diffuse blistering eruptions involving the dorsal arms, chest, abdomen, and upper back. She was a known case of Systemic Lupus Erythematosus (SLE) for six years, previously well-controlled on hydroxychloroquine and low-dose oral prednisolone. She also complained of knee pain and intermittent abdominal pain with vomiting. Six years prior, her initial presentation included fever, facial rash, oral ulcers, alopecia, arthritis and hematologic abnormalities (Hemolytic anemia, Hb 8.4 g/dL, thrombocytopenia, 122,000/mm^3). ANA and anti–double-stranded DNA (Anti-dsDNA) were positive, confirming SLE.

On examination, widespread erythematous, well-defined, confluent papules and plaques with blistering were noted [Figure 1a]. Hemorrhagic crusts involved the lips and oral mucosa. Lesions were symmetrically distributed on the face, trunk, extremities (Including palms and soles) and some were targetoid in appearance. Vital signs and systemic examination were unremarkable.

Laboratory investigations showed: Hemoglobin 10.4 g/dL, WBC 5,500/mm^3, Platelets 162,000/mm^3, ESR 80 mm/h and normal electrolytes, PT, and APTT. Serology revealed positive ANA (390.0 AU/ml, normal <40.0) with speckled pattern, anti-dsDNA (215 IU/ml, reference <30 IU/ml) and rheumatoid factor (17 IU/ml). Anti-Ro (SS-A) and Anti-La (SS-B) were negative, while HSV-1 and HSV-2 IgM and IgG were positive. Ultrasonography (KUB) echocardiography and ophthalmologic evaluation were normal. A diagnosis of Rowell's syndrome was established based on SLE features and EM-like skin manifestations fulfilling the Zeitouni et al. (2000) diagnostic criteria.[7]

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The patient was treated with oral prednisolone 40 mg/day (In divided doses) and hydroxychloroquine 200 mg/day. After one month, there was marked improvement in cutaneous and mucosal lesions [Figure 1b], with no new lesions or systemic exacerbation. She remains under regular follow-up with no recurrence.

Figure 1 (a) Extensive erythema multiforme lesions over face, trunk, abdomen, back, and extremities with minimal epidermal detachment over soles.

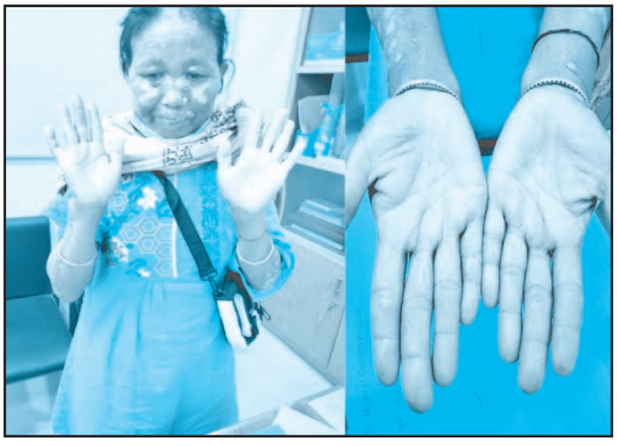

Figure 1 (b) Healing skin lesions of Rowell syndrome after 4weeks of therapy

Discussion

The coexistence of LE and EM-like lesions was first noted by Scholtz in 1922 and the syndrome was defined by Rowell et al. in 1963 as a unique overlap entity characterized by LE, EM-like eruptions and immunologic abnormalities (Positive RF, speckled ANA pattern, and anti-SjT antibodies).[8,6] In 1995, Lee et al. included chilblain lesions as an additional diagnostic feature and Zeitouni et al. proposed revised diagnostic criteria.[9,7] Diagnosis requires all three major and at least one minor criterion:

Major criteria

i) Lupus erythematosus (DLE, SCLE or SLE)
ii) Erythema multiforme-like lesions (± mucosal involvement)
iii) Speckled ANA pattern.

Minor criteria

i) Chilblains
ii) Positive anti-Ro or anti-La antibodies
iii) Positive rheumatoid factor.

Most RS cases are reported in middle-aged women, consistent with our case.[10] Speckled ANA is present in about 88% of patients, while RF positivity occurs in approximately 40%.[10,11] Management parallels that of SLE and includes corticosteroids, antimalarials and immunosuppressants such as azathioprine, dapsone or cyclosporine.[3,4] Our patient responded rapidly to prednisolone and hydroxychloroquine, with complete remission within four weeks.

Despite refined diagnostic criteria, debate persists as to whether RS represents a true overlap syndrome or a variant of subacute cutaneous LE with EM-like morphology.[11,12] However, continued reporting of such cases supports the recognition of RS as a distinct clinical entity with characteristic immunological features.

Conclusion

Although rare, Rowell's syndrome should be considered in patients with lupus erythematosus presenting with erythema multiforme-like lesions. Early recognition and appropriate immunomodulatory therapy can achieve excellent outcomes.

Disclosure

All the authors declared no competing interest.

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