ISSN 2313-4941

Volume 13 Number 2 July 2025

The Journal of Ad-din Women's Medical College

Recognized by BM & DC

The Journal of Ad-din Women's Medical College

Volume 13, Number 2, July 2025

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ISSN 2313-4941

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Instruction for the Authors

The Journal of Ad-din Women's Medical College (ISSN 2313-4941) is an official organ of the Ad-din Women's Medical College, Dhaka and published twice in January and July every year. This journal is recognized by the Bangladesh Medical and Dental Council (BMDC). We publish original articles, review articles, case reports and others (see page vi) including society news.

The manuscripts submitted in this journal should not have been published in any other journal before. All submitted papers are subjected to be reviewed by the board of reviewers and editorial panel before accepting any manuscripts. The unaccepted articles will not be sent back, but will be destroyed. Proof corrections by the authors are well appreciated.

Submission of manuscripts

Papers are accepted for publication with an understanding that they are submitted solely to the journal of Ad-din Women's Medical College and are subject to peer review and editorial revision. Statement and opinion expressed in the papers, communications letter herein are those of author(s) and not necessarily of the editor and/or publisher.

Papers should be submitted with three hard copies and a soft copy (CD) labeled clearly with the manuscript title, name of first author with date, designation, mobile no. and email address to the Executive Editor with a copy to Editor-in-Chief of journal of Ad-din Women's Medical College, 2 Bara Moghbazar, Dhaka-1217, Bangladesh.

Form of full papers submitted for publication

The manuscript should be prepared using MS-Word. The whole manuscript should not exceed 4000 words. The manuscript should be divided into: (title page, abstract, body/text, references), but should be submitted as one document. All parts of the manuscript should be typed or printed on only one side of the paper in double space with wide margins of at least 2.54 cm in all sides of the manuscript throughout.

While the preferred font remains Times New Roman size 12 cpi. numbering of the pages should be done consecutively, beginning from the title at the lower right hand corner of each page. Each component of the manuscript should begin on a new page in the sequence of title page, abstract, text, reference, tables and legends for illustration.

Title page

The title page should include the title of the manuscript which should be concise within 45 characters. Name of authors with their highest academic degree(s), institutional affiliations and name of the departments should be mentioned. The complete mailing address and email IDs of the first and correspondence author(s) should be included to whom the proofs and all other correspondence should be sent.

Abstract

Each manuscript requires an unstructured abstract that should include objective, methods, results, conclusion and key words in not more than 150 words for any review article or case report an 250 words for structured abstract only for original article summarizing the significant information and findings. Authors must give two to five key words identifying the most important topics covered by the manuscript. Abbreviations, diagrams, and references in the abstract should be avoided.

Body/Text

The body of the manuscript/text should be divided into the following sections: i) Introduction, ii) Materials and Methods, iii) Results (include tables and diagrams), iv) Discussion, v) Conclusion, and vi) Acknowledgement if any (particularly on funding, study subjects and co-author).

Introduction

It includes a short yet robust background purpose and the rationale for the study (or summarized observation), including pertinent references, but data or conclusion from any work should not to be included.

Material and methods

In this section, selection of the study subjects (patient or laboratory animals, including controls) should be described clearly. The age, sex and other characteristics

of study subjects should be identified. The total methodology in details, apparatus to be used, and procedure to be followed must be given in sufficient details to allow other researcher to reproduce it, as and if required for. References should be given to establish methods including statistical lines and precise identifications should be provided for all the drugs and chemicals to be used including generic names, dosage and route of administrations. Authors(s) submitting review manuscripts are advised to include a section describing the methods used for locating selecting, extracting and synthesizing data. If data is collected from other sources (published or unpublished) then proper permission(s) should be obtained and mentioned with acknowledgement.

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Results should be presented in a logical sequence in the text, tables, figures and/or illustrations. The use of too many tables or diagrams in relation to the length of text may produce difficulties in the layout of pages.

Tables and Figures

Tables should be embedded in the text and numbered consecutively in the order of their first citation in the text. The title of the table should be brief yet self-explanatory. Tables should not be submitted as photograph. All figures should be included as one separate sheet or file. The title should appear above each table (short and descriptive. Please mention a clear legend and any footnotes suitably identified below, clearly. Figures should be labeled properly, fitting to necessary size of the page. Captions of all figures should be typed, double-spaced and showed on a separate sheet. All original figures should be clearly marked in pencil on the reverse side with the number, author's name.

Footnotes

Place explanatory matter in footnote, not in the heading. For uniformity of style, authors should use symbols for footnotes such as 51.7 etc.

Illustrations

Illustrations submitted (line drawings, photos, photo-micrographs, etc.) should be clean, original, or as a digital files. Digital files are recommended to use since this produces highest quality following criteria, below:

- Minimum 300 dots per inch (DPI) or higher
- Appropriate sized to fit in journal page
- Preferably in JPEG and GIF formats
- Subject/ patient face must not be identified in diagram
- Should be submitted as separate files, not embedded in text files.

Discussion

This section should present a detailed yet comprehensive analysis of findings/results to describe, compared & criticized (positively or negatively) in the light of previous relevant studies, in the country or abroad. It should emphasize the new and important aspect of the study and the conclusions that follow from them. Repetition of detailed data &/or other materials given in introduction or result section may be avoided, unless deemed essential (in rare cases).

Conclusion

In the gist, study findings should be linked with the study goals. Recommendation may be included as appropriate including implication(s) of the findings and limitations if any.

Acknowledgements

Acknowledgement may be added, but if any should be placed at the end of the body/text and should be limited within 100 words. This section may particularly be used to acknowledge those persons who do not qualify for authorships but worked significantly for this study or write up manuscripts.

Acknowledgement for funding, donated resources, or significant contributions of research materials be made as well, if author(s) wish.

References

All references should be cited in the text following Vancouver system/style in Arabic numbers, to number the texts, consecutively, following an order in which if appears first in the text using superscript (or cite within the text numbers in round brackets). If a reference is cited more than once the same number should be used each time. References cited only in tables or figure legends should be numbered in accordance with the sequence from the last number used in the text and follows the order of individual tables/figures. At the end of the paper, on a page(s) separate from the text, a references list must be added following exact Ref. No. in numerical order. References to materials available on websites should include the full internet address and the date of the version cited as: Authors' names (in normal order), document title, and date of Internet publication

or other retrieval information (date of access), text division (if applicable). Examples of references are given below.

(i) Reference from the Journals

1. Parkin DM, Clayton D, Blook RJ, Massyer E, Fried HP, Iranov E et al. Childhood leukaemia in Europe after Chernobyl: 5 years follow up. Br J Cance 1996; 73: 1006-1012
2. Paganini HA, Chao A, Ross RK, Henderson Aspirin use and chronic diseases: a cohort st of the elderly. BMJ 1989; 299: 1247-1250

Note: The name of the journal & its volume should be in Italic.

(ii) Books

1. Gyton AC, Hall JE The thyroid metabolic hormones In Textbook of Medical Physiology. 10th edn. NewTork: WB Saunders Company. 2000: 858-86

(iii) Internet

I. Harverd medical school Available https:// en.wikipedia. org/wiki/havard medical college, accessed October 2011

(iv) Thesis/Dissertations

1. Khan MAH. Lipid profile and renal function status of hypothyroid patients [MD Thesis). Dhaka Bangabandhu Skeikh Mujib Medical University:2005

(v) Scientific or technical report

1. Akutsu T. Total heart replacement device. Bethesda MD: National Institutes of Health, National Heart and Lung Institute, 1974 Apr report No. N1H-NHLI-69 2185-4 Ethical approval

The authors should mention the name of the ethical approval authority or (IRB: Institutional Review Board) for their study either separately or in materials and methods section, particularly if the study has been done on human subjects, laboratory samples or laboratory animals. However, not all surveys may not require an ethical permission, parse, in general. But it can be obtained & attached with the proposal, if the authors(s) wish.

Authorship Statement

A form must be signed by all listed authors indicating the contribution to the paper made by each. The corresponding author is responsible for obtaining signatures from all listed authors and using. A check off form, should indicate by name what each author contributed to each of the various aspects of the study: However, (e-signature are accepted except 1st & corresponding authors).

- study concept
- study design
- data collection & processing
- statistical analysis
- manuscript writing

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Once the Board of Editors receives the manuscripts it would be examined & reviewed thoroughly for its content, quality, writing skills & if the manuscript contains any newer/novel issues, important to get it published. Rejected manuscripts will not be returned. Proofs correction by the authors will be

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Please read the following submission checklist that summarizes the main features for manuscripts to be submitted at the Ad-din Women's Medical Journal. Please ensure your manuscript follows the recommended number of pages, references etc. for specific articles to be accepted by the Ad-din Women's Medical Journal as shown below.

1. Type of article: **Original Article**
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5. Type of article: **Clinical overview**
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6. Type of article: **Review article**
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   Key notes: Yes
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   Keywords: Yes

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   Abstract: Yes, 200
   Key notes: Yes
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   Keywords: Yes

9. Type of article: **Society news**
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   Key notes: Yes
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   Keywords: No

10. Type of article: **Commentary**
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    Key notes: No
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    Headings: No
    Keywords: No

11. Type of article: **Perspective**
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    Abstract: No
    Key notes: No
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12. Type of article: **Reader's forum**
    No of references: 3
    Abstract: No
    Key notes: No
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    Headings: No
    Keywords: No

13. Type of article: **Essay**
    No of references: 5
    Abstract: No
    Key notes: No
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    Headings: Yes
    Keywords: No

14. Type of article: **Different view**
    No of references: 10
    Abstract: No
    Key notes: No
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    Keywords: No

15. Type of article: **News and views**
    No of references: No
    Abstract: No
    Key notes: No
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    Headings: Yes
    Keywords: No

16. Type of article: **Letter to the Editor**
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    Key notes: No
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    Headings: Yes
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Editorial

Challenges for the Non-Governmental Medical Colleges in Bangladesh

Muhammod Abdus Sabur

Bangladesh started its journey with eight government medical colleges. The first non-government medical college was established in 1986. Now the country has 37 government, 66 non-government and 7 military medical colleges. Among the total seats of 11,556, government medical colleges have 5,100, non-government have 6,001 and military have 455 seats (DGME 2025). Thus, the share of government in graduate medical education is 34 percent considering the number of medical colleges and 44 percent considering seats in the medical colleges; while share of non-government sector is 60 percent in the number and 52 percent in the seats. Though the non-government sector out-number the government in both the number and seats for the medical colleges and thus major contributor in the medical education and subsequently health service delivery, yet they face enormous challenges.

Non-government medical colleges are regulated by the Non-Government Medical College and Dental College Law, 2022. According to the Constitution of the People's Republic of Bangladesh, *all citizens are equal before the law and are entitles to equal protection of law* (article 27). Thus, having a law applicable only for the non-government medical colleges and not for the government and military medical colleges conflicts with the constitution.

The law specified three masters for the non-government medical college: (i) Government represented by the Ministry of Health and Family Welfare (MOHFW) together with the Directorate General of Medical Education (DGME) (sections 9 and 10), (ii) Bangladesh Medical and Dental Council (BMDC) (section 12), and (iii) respective public or public medical university (section 13). Each of these masters undertake annual visit in the non-government medical college, look for the same type of issues and make more or less similar recommendations. The MOHFW need 1,00,000, DGME 70,000, BMDC 1,50,000 and Dhaka University 700,000 (Khulna Medical University 600,000) taka as fees for each of such visit. The visiting team also need to be hosted with due hospitality. Consider the time and resources devoted for such masters visits annually. Non-government medical colleges turn to be the milking cow.

However, the law has the provision of Inspection Committee (section 7) formed by drawing members from MOHFW, DGME, BMDC and public university. Since this inspection committee has representation from all the masters, a single visit annually should serve the purpose instead of separate visits by each of them. This will save hassle and resources from all parties concerned.

The law specified about the formation of the Governing Body of the non-government medical college (section 18) with members from the Government (represented by the MOHFW), respective public university and DGME. These three constituencies are also the masters. As members of the governing body, they are part of the medical college governance and operation, yet again they are also part of regulators as masters to oversee operation of medical college. As if they are players and also referee! The two roles are conflicting.

About the Governing Body formation, the law is somehow contradictory. Section 18(1) mentions formation of the Governing Body by following rules-regulations of the respective public university. But section 18(3) mentions to have one member from each of the Government, public university and DGME. Dhaka University referring to its syndicate approved policy (on 27.1.2010) is nominating 5 members (2 education-fonder, 2 nominated by Dhaka University academic council and respective dean

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Received Date : 05 May, 2025

Accepted Date : 10 May, 2025

of the faculty) in the Governing Body. Khulna Medical University syndicate approved policy (on 2.4.2022) on Governing Body formation has 2 members nominated by the vice-chancellor and 1 member from the BMDC. Confusion continues.

According to the law, the qualifications for the teachers of the non-government medical colleges are supposed to be determined by the BMDC (section 15.2). However, BMDC has not fixed such. In practice, non-government medical colleges follow the teachers' selection criteria followed for the government medical colleges. Since the government medical college teachers belong to Bangladesh Civil Service (Health), the government follow the Bangladesh Civil Service Recruitment Rules, 1981 (amended in 1988) for Health. However, this is almost four decades old rule and thus faces implementation difficulty in the changed context. For example, in those days there were no post-graduate qualifications available for Forensic Medicine in the country and thus 5 years experiences were fixed for Assistant Professor's qualification, when for other subjects, post-graduate qualifications were fixed for Assistant Professors. Now with the post-graduate qualifications available in Forensic Medicine, ideally their promotions should be like other subjects, which is post-graduate qualifications without any experiences. But many of the teacher selection committee members still demand experiences mentioned. Another confusion is about the required duration of teaching experiences in the feeder post. With the practice of placing in current charge of the position, confusion arises whether current charge experience to be considered or not. The other requirement for Associate Professor and Professor is specified number of publications. Just required number of publications is mentioned, without specifying whether those publications need to be as first author or co-author. Thus, interpretation is made differently by different teacher selection committee members.

Since the non-government medical colleges play significant role for the country, their challenges need to be addressed immediately to support their smooth operation. Government should take steps to address the issues, so that non-government medical colleges can operate without difficulties and thus contributing to the country.

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1. DGME 2025. https://dgme.gov.bd/site/page/34eda39c-9c0d-4a01-af51-2fe8fca5cdcb accessed on 31 December 2025

Original Article

Hearing Evaluation After Myringoplasty in Underlay Technique

Mahmudul Hasan Khan[1], M Arafat Rahman[2], Anower Parvej (Shujon)[3], Md. Hasan Hafijur Rahman[4]

Abstract

Background: Chronic suppurative otitis media (CSOM), particularly the inactive mucosal variety, remains a significant cause of hearing impairment in Bangladesh. Myringoplasty is a commonly performed surgical procedure to restore the integrity of the tympanic membrane and improve hearing. This study aimed to evaluate hearing outcomes following myringoplasty using the underlay technique.

Objective: To evaluate hearing improvement and factors influencing outcomes following underlay myringoplasty in CSOM patients.

Materials and Methods: This cross-sectional study was conducted at Ad-din Women's Medical College and Hospital, Dhaka, over a 24-month period from January 2023 to December 2024. Forty patients aged 15–45 years with central perforation of the tympanic membrane due to inactive mucosal CSOM were selected based on strict inclusion and exclusion criteria. All patients underwent myringoplasty using the underlay technique with autologous temporalis fascia. Hearing improvement was assessed through pure tone audiometry, measuring air conduction thresholds and air-bone gap preoperatively and at the 5th and 9th postoperative weeks.

Results: The overall graft take rate was 92.5%. Hearing gain (defined as an improvement in air conduction threshold) was observed in 70% of patients. The mean preoperative air conduction threshold and air-bone gap were 37.27 ± 8.96 dB and 26.01 ± 2.27 dB, respectively, which improved to 27.41 ± 5.67 dB and 17.56 ± 1.70 dB postoperatively. Greater hearing gain was noted in patients with small perforations and posterior sites, whereas subtotal perforations had comparatively less gain. No statistically significant association was found between hearing improvement and age, sex, or habitat.

Conclusion: Myringoplasty using the underlay technique is effective in achieving a high rate of graft uptake and significant hearing improvement. Factors such as size and site of perforation influence the audiological outcomes. These findings can guide surgical decision-making and patient counseling in managing CSOM.

Keywords: Myringoplasty; Tympanoplasty; Graft uptake; Temporalis fascia graft.

Introduction

Tympanic membrane (TM) perforation is commonly caused by acute or chronic middle ear infections, trauma, or iatrogenic factors. Chronic otitis media (COM) is particularly prevalent in Bangladesh and is a major contributor to TM perforation, presenting with symptoms such as deafness, ear discharge, and conductive hearing loss. The extent of hearing loss depends largely on the size and location of the perforation as well as the integrity of the ossicular chain. A perforation reduces the effective vibratory surface of the TM, disturbs the mechanical connection to the malleus, and decreases the pressure differential across the membrane, resulting in impaired sound transmission.[1]

There is a quantitative relationship between the size and location of the perforation and the degree of hearing loss. Small perforations involving less than 10% of the TM

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Received Date : 12 April,2025
Accepted Date : 16 May,2025

may result in minimal hearing loss (10–15 dB below 3 kHz), while larger perforations cause more widespread loss, particularly at higher frequencies due to direct sound transmission to the round and oval windows. Posterior and superior perforations tend to result in greater hearing deficits compared to anterior or inferior ones. Non-marginal perforations with intact ossicles typically lead to 10–30 dB of hearing loss.[2] Despite these impairments, up to 80% of TM perforations may close spontaneously without surgical intervention.[3]

Myringoplasty is the surgical repair of a perforated TM aimed at restoring the integrity of the membrane and improving hearing. Historically, Marcus Banzer first attempted TM closure in 1640 using a ring of elkhorn wrapped in pig bladder.[4] The term "myringoplasty" was introduced by Berthold in 1878 after achieving membrane closure with a full-thickness skin graft. However, widespread success was limited until the advent of the operating microscope in the 1950s by Wullstein and Zoellner.[5] Since then, advancements in technique and grafting materials have significantly improved outcomes.

For surgical purposes, the TM is divided into four quadrants: anterior, posterior, superior, and inferior. Perforations are categorized based on their size—small, medium, or large—and their anatomical location, often described relative to the malleus handle. Most central perforations occur in the pars tensa and may be classified as anterior, posterior, inferior, or subtotal.

A wide variety of autologous graft materials have been used successfully in myringoplasty, including temporalis fascia, perichondrium, cartilage, and adipose tissue. These can be harvested via transcanal, postaural, or endaural approaches. Graft placement can be achieved using underlay, overlay, or inlay techniques, depending on the location and extent of the perforation.[6]

Reported success rates of TM closure and hearing restoration vary widely. In adults, closure rates range from 60–99%, while in children, the range is 35–94%.[7] One study found that smaller perforations had a higher closure rate (74%) compared to larger ones (56%).[8] Another study reported a mean hearing gain of 8.0 dB and a closure rate of 97%.[9] Furthermore, there is a clear correlation between preoperative perforation size and postoperative hearing improvement. A study reported mean air conduction audiometric gains of –4.0 dB for 0–20% perforations, –5.0 dB for 21–40%, –9.1 dB for 41–60%, –10.8 dB for 61–80%, and –13.3 dB for 81–100%, with an overall success rate of 80.8% (105/130).10 Interestingly, none of the studied characteristics, including hole size, significantly predicted surgical success, although larger perforations tended to show greater hearing gain postoperatively.[10]

Favorable outcomes are often associated with central dry perforations, a functional eustachian tube, and absence of active middle ear or upper respiratory tract infections. With the integration of microsurgical techniques, myringoplasty has become a routine procedure in modern otologic practice.

The primary goals of myringoplasty are to restore TM integrity, improve hearing, and facilitate hearing aid use when necessary. This cross-sectional study was conducted at several tertiary hospitals in Dhaka to evaluate the hearing status of patients with CSOM before and after undergoing myringoplasty. The findings aim to provide insight into the factors influencing surgical outcomes and assess the effectiveness of myringoplasty as a hearing restoration procedure. Ethical considerations were rigorously observed, and the study attempts to address existing limitations and gaps in previous research.

Materials and Methods

This cross-sectional study was conducted at Ad-din Women's Medical College and Hospital, Dhaka, over 24 months (January 2023–December 2024). A total of 40 patients aged 15–45 years with inactive mucosal CSOM and central tympanic membrane perforation undergoing underlay myringoplasty were included through purposive, non-random sampling. Exclusion criteria included attic-antral disease, ossicular abnormalities, inner ear pathologies, prior ear surgeries, or need for additional procedures. Data were collected via structured questionnaires and clinical examinations. Investigations included pure tone audiometry, X-ray mastoid, and PNS. Surgery was performed using the postaural underlay technique with temporalis fascia. Follow-up was weekly for the first month, then at weeks 5 and 9. Hearing thresholds were measured pre- and post-operatively at 500, 1000, 2000, and 4000 Hz. Surgical success was defined as an intact, mobile tympanic membrane and dry ear. Data were analyzed using SPSS v22. T-tests were used for statistical analysis with significance set at $p < 0.05$.

Results

This cross-sectional study was carried out to assess the hearing of forty (40) patients who underwent myringoplasty using the underlay technique between 24 months (January 2023 to December 2024) at Ad-din Women's Medical College and hospitals.

Of the forty patients, nineteen were male and twenty one were female.

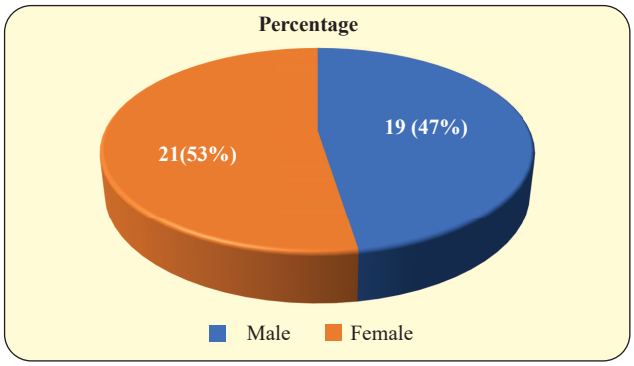

Figure-1: Sex distribution of the patient with Myringoplasty

The patient ranged in age from 15 to 45 years. Majority of patients were male 21 (53%) and female were 19 (47%).

Table -1: Age distribution in different sex group of the patient with myringoplasty (n=40)

Age	Male (%)	Female (%)	Total (%)
15-20 years	3 (15.8)	0 (0)	3 (7.5)
21-25 years	3 (15.8)	5 (23.8)	8 (20)
26-30 years	5 (26.3)	6 (28.6)	11 (27.5)
31-35 years	4 (21.1)	3 (14.3)	7 (17.5)
>35 years	4 (21.1)	7 (33.3)	11 (27.5)

Data was presented as a number with a percentage in parentheses

The table displays the distribution of sex groups of different age group in the different age categories, as well as the number and percentage of people in each group. Of the total 40 participants, most of them belonged to the 26-30 years and >35 years age groups, whereas the 15-20 years age group is smaller than the other groups (Table 1).

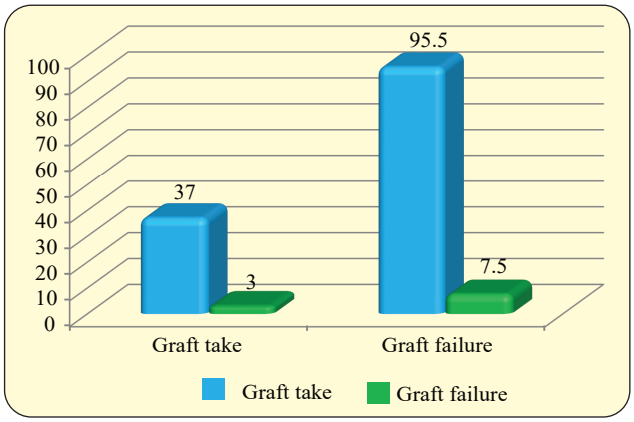

Figure-2: Graft take rate (n=40)

The figure shows that overall graft was taken in 37 out of 40 cases (92.5%) and graft failure in 3 cases (7.5%).

Table-2: Hearing Improvement in Successful Cases

	Frequency	Percentage
Hearing gain	28	70
No improvement	12	30

The table shows that hearing gain occurred in 28 patients (70%), while no improvement was observed in 12 patients (30%) (Table 3.2).

Table-3: Hearing Improvement After Myringoplasty in the Patient of Different Age Group

Age Group	Hearing status		P-value
	Hearing gain	No improvement	
≤26 years	8	3	0.81
>26 years	20	9	

Chi-square test

Regarding hearing improvement, no significant difference was observed between the younger and older age groups (p = 0.81).

Table-4: Hearing Improvement After Myringoplasty in the Patient of Different Habitant

Habitant	Hearing status		P-value
	Hearing gain	No improvement	
Rural	10	5	**0.72**
Urban	18	7	

Chi square test

There was no statistically significant difference in hearing gain among the different habitation groups (p = 0.72).

Table-5: Hearing Threshold and Air Bone Gap (ABG) Of the Patient Before and After Myringoplasty

Hearing Thresholds	Male (n=19) Mean±SD	Female (n=21) Mean±SD	Total (n=40) Mean±SD
Preoperative			
Air conduction threshold	35.21±9.11	39.12±8.63	37.27±8.96
Air bone gap	25.62±2.58	26.36±1.94	26.01±2.27
Postoperative (5th WK)			
Air conduction threshold	29.65±6.44	32.88±6.47	31.35±6.58
Air bone gap	21.52±2.25	20.22±1.52	20.84±1.99
Postoperative (9th WK)			
Air conduction threshold	25.12±5.17	29.49±5.40	27.41±5.67
Air bone gap	18.15±1.66	17.03±1.59	17.56±1.70

Data was presented as Mean±SD

Underlay myringoplasty resulted in significant hearing improvement, as demonstrated by decreased air conduction thresholds and reduced air-bone gap (ABG) in both genders. The most substantial gains were observed between the preoperative period and the 5th week, with smaller but continued improvements by the 9th week. Gender-related differences were noted: males exhibited better absolute air conduction thresholds postoperatively, whereas females showed slightly lower ABG at the 5th and 9th weeks, indicating a more favorable recovery of conductive function.

Table-6: Average Improvement of Hearing (Mean ABG) In Different Sizes of Perforation

Size	Total (%)	Mean	SD
Small	5 (12.5)	18.17	2.53
Medium	11 (27.5	17.38	1.35
Large	9 (22.5)	16.83	1.51
Subtotal	15 (37.5)	17.94	1.73

Data was presented as Mean±SD

In terms of hearing, myringoplasty appears to be beneficial for all sizes of perforations. Although the group differences are slight and may not be clinically significant, the mean ABG improvement is slightly better for tiny holes. These results show that the degree of hearing improvement is not significantly influenced by the size of the perforation, demonstrating the general effectiveness of the underlay technique.

Table-7: Average Improvement of Hearing (Mean ABG) In Different Size of Perforation

Size	Total (%)	Mean	SD
Anterior	10 (25)	13.53	1.34
Posterior	6 (15)	14.86	2.38
Inferior	6 (15)	14.09	1.06
Subtotal	18 (45)	14.48	1.54

Data was presented as a number with a percentage in parentheses

The differences in mean ABG improvement across locations are minimal (ranging only about 1.3 dB), suggesting that perforation location exerts limited influence on postoperative hearing outcomes. The consistently low standard deviations further indicate uniform surgical success across all locations.

Discussion

Myringoplasty has evolved significantly over the past five decades, primarily due to advancements in microsurgical techniques, operating microscopes, and the proliferation of trained ENT specialists. This study, conducted at Ad-din Women's Medical College and Hospital, Dhaka, between January 2023 and December 2024, evaluates the anatomical and audiological outcomes of myringoplasty in 40 patients with the inactive mucosal type of chronic otitis media (COM), aiming to contribute to the growing body of evidence supporting the efficacy of the procedure.

The overall graft success rate in our study was 92.5% (37 out of 40 cases), which is consistent with several earlier studies. Virtanen reported a graft take rate of 91.2%[11], while Ugo Fisch and Kotecha reported rates of 86% and 82%, respectively[11]. This high success rate may be attributed to meticulous surgical technique, patient selection based on strict inclusion and exclusion criteria, and the use of temporalis fascia as the graft material via the underlay method.

In terms of hearing outcomes, our study showed that 70% of patients experienced a hearing improvement of ≥ 10 dB, which is considered clinically significant. This is in line with the findings of Umapathy, who reported significant hearing gain in 72% of their cases[12], and slightly higher than Makaya's findings, where 62% of patients showed a hearing improvement of over 10 dB[13]. The mean improvement in air conduction thresholds postoperatively was from 37 dB to 27 dB, with an air-bone gap (ABG) closure from 26 dB to 17 dB. These results are comparable with studies by Biswas, who reported an improvement from 34 dB to 24 dB, and an average hearing gain of 10 dB in 60.78% of patients[11].

Other studies have reported a broader range of hearing outcomes. Karela observed hearing improvement in 91.5% of cases[14], while Kotecha reported a 67% improvement rate[15]. Bahmed reported a more optimistic outcome with a 98.5% success rate and a mean ABG reduction of 12.65 dB[16]. In contrast, She in a study from China, found that the underlay technique resulted in a 57.5% improvement rate compared to 71.9% with the over-under technique, with ABG closures of 4.9 dB and 9.7 dB respectively[17]. These variations may be due to differing surgical approaches, graft materials, patient demographics, and inclusion criteria.

Interestingly, in our study, 30% of patients showed no significant hearing improvement despite successful graft uptake. This observation is supported by earlier research suggesting that even with intact ossicular chains, residual fibrosis, middle ear scarring, or ossicular fixation

might limit postoperative hearing outcomes[2,18]. Additionally, preexisting sensorineural components of hearing loss may contribute to suboptimal hearing gain post-surgery.

We found no statistically significant difference in hearing improvement between different age groups (P = 0.81), consistent with Karela., who reported that age had no bearing on surgical success or hearing improvement[14]. Similarly, no significant gender-based difference was noted in our study. Male patients showed a mean ABG improvement of 18.15 dB compared to 17.03 dB in females, which aligns with findings by Karela, who noted no statistically significant difference across gender (P = 0.164)[14].

Urban versus rural habitation did not affect outcomes, suggesting that socio-geographic variables had minimal influence when surgical and postoperative care standards were maintained.

The size and site of tympanic membrane perforation have historically been debated as factors influencing surgical outcomes. In our cohort, the most common perforation size was subtotal (37.5%), followed by medium (27.5%), large (22.5%), and small (12.5%). The mean audiological improvements across these categories were 18.17 dB, 17.38 dB, 16.83 dB, and 17.94 dB respectively. These findings indicate that the size of the perforation did not significantly affect hearing improvement, which is in agreement with Karela (P = 0.198)[14]. However, Lee. suggested that smaller perforations have a higher graft success rate (74.1% vs. 56% for large perforations) and a better audiological outcome, with changes in air conduction thresholds of +7.2 dB for small and +10.2 dB for large perforations.[19]

Regarding perforation site, our series found that anterior perforations had the least audiological improvement (13.53 dB), compared to posterior (14.86 dB), inferior (14.09 dB), and subtotal perforations (14.48 dB). Subtotal perforations often present with more extensive mucosal pathology and ossicular involvement, which may explain the relatively modest improvement despite successful closure. Similar findings have been documented in literature, where subtotal perforations are linked with greater preoperative hearing loss and reduced postoperative gain[2].

Finally, the overall hearing improvement was in line with reports by other authors. For example, one study reported ABG closure within 0–10 dB in 26.3% of patients, 10–20 dB in 34.2%, and 20–30 dB in 39.4%[20]. Similarly, an ABG of less than 20 dB was achieved in 56% of cases in another study[21]. Lee and Paiva & Ramsay observed mean hearing improvements of 8 dB, similar to our findings[18].

Limitations of the study

In light of the study's noteworthy findings, every effort has been made to get over its constraints. Beyond the study's purview, the following restrictions were found. A limited number of cases are studied at a limited number of centers during a brief period. This study's findings could not accurately represent the entire situation. Up to two years following myringoplasty, the tympanic membrane may perforate. Therefore, it is advised that patients be followed up over time.

Conclusion

This cross-sectional study demonstrated that myringoplasty using the underlay technique is an effective surgical procedure for improving hearing in patients with chronic otitis media of the inactive mucosal type. Hearing improvement following successful graft uptake was influenced by specific preoperative factors, particularly the size and site of the tympanic membrane perforation. Patients with smaller perforations experienced more favorable audiological outcomes, while those with subtotal perforations, despite anatomical success, showed comparatively limited hearing improvement. Posterior perforations were associated with better postoperative hearing gain, suggesting that the location of the perforation plays a role in functional recovery. These findings highlight the importance of thorough preoperative assessment of perforation characteristics to better predict postoperative hearing outcomes in myringoplasty.

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Original Article

Knowledge About The Screening of Cervical Cancer for Its Early Detection Among Women of Reproductive Age Group in Dhaka City

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Abstract

Background: Cervical cancer is one of the main reasons for the death of women's in the world. It is a major public health problem and it is the second most common cancer in women worldwide which is the leading cause of deaths of women in developing countries. Proper knowledge about the screening and concerned them about its curability if diagnosed in early stage could have a major impact.

Objective: To assess the level of knowledge about the screening of cervical cancer for its early detection among women of reproductive age group.

Methods: This was a Descriptive type of cross-sectional study. It was conducted from September 2024 to November 2024. A total of 100 participants participated in the study. Data were collected using self-administered structured questionnaire. The data were processed by computer and statistical analysis of data was carried out by using SPSS method.

Results: Result showed that among 100 respondents' majority 23 (23) were 30-34 years old. 51 (51) respondents were married. 22 (22) participants got knowledge about screening test of cervical cancer from mass media and 14 (14) knew about different types of screening test. 27 (27) participants of reproductive age group had the knowledge that cervical cancer is curable if detected in early stage.

Conclusion: Unfortunately, the cervical cancer is the second leading cause of deaths in cancer in Bangladesh. There is a huge need to continue with the innovative steps that have been made to overcome the health care barriers crippling this population.

Key words: Knowledge; Screening; Cervical Cancer; Reproductive Age.

Introduction

Cervical cancer is the fourth most common cancer in women worldwide and a leading cause of cancer deaths in developing parts of the world. During the past few decades' tremendous strides have been made toward decreasing the incidence and mortality of cervical cancer with the implementation of various prevention and screening strategies. The causative agent linked to cervical cancer development and its precursors is the Human Papilloma Virus (HPV). Prevention and screening measures for cervical cancer are paramount because the ability to identify and treat the illness at its premature stage often disrupts the process of neoplasia. In resource-rich countries, cervical cancer incidence and mortality are lower due to the availability of screening and human papillomavirus (HPV) vaccination.[1] Cervical cancer screening can detect precancerous changes, and treatment of these precursors can prevent the development of invasive cancer.[2] Vaccination is the only way to primarily prevent cervical cancer, while cervical cancer screening measures are essential for secondary prevention. The first cervical cancer screening test was

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Received Date : 6 February, 2025

Accepted Date : 23 February, 2025

developed by George Papanicolaou and Herbert Traut, who described it in their book Diagnosis of Uterine Cancer by Vaginal Smear in 1943.[3]

Although many discoveries and developments have been made since the 1940s, the basis of the "Pap smear", or analysis of cervical cytology remains integral to screening today. In the early 2000s, development of liquid-based cytology was introduced as an alternative and now preferred method of performing a Pap smear.[4] Other modalities of cervical cancer screening historically used in resource-scarce settings or less-common settings include Visual Inspection with Acetic acid (VIA) and Visual Inspection with Lugol's Iodine (VILI).[5] Cervical cancer remains a significant worldwide health concern. The annual number of global new cases of cervical cancer has been projected to increase between 2018 and 2030 from 570,000 to 700,000 and the annual number of deaths projected to increase from 311,000 to 400,000.[6] Cervical cancer is a fully preventable disease, but remains the main cause of cancer death in women in 36 low-income and middle-income countries (LMICs).[7] In Bangladesh, cervical cancer is the second most common cancer of female (12%). The number of new cases was 8,068 (10.6 per 100,000 women) and deaths was 5.214 (7.1 per 100, 00 women) in 2018.[8] The prediction was that without any intervention, a total of 505,703 women in Bangladesh will die from cervical cancer by the year 2070, and the number will rise to 1,042,859 by 2120.[9]

Until vaccination uptake is significant, screening by a highly sensitive methodology should be utilized. The WHO strategy to eliminate cervical cancer (a cervical cancer incidence rate of less than or equal to 4 per 100,000 women) by 2030 is an attainable goal.[10] Good knowledge, attitudes, cost-effectiveness, and recommendations from healthcare workers are important factors associated with cervical cancer screening in women. Public health campaigns and mass media can also play an important role in raising awareness about the screening of carcinoma cervix and continuous efforts could be made to reduce the mortality rates from cervical cancer.

Materials and Methods

This was a descriptive type of cross-sectional study regarding Knowledge about the screening of carcinoma cervix among women of reproductive age group. It was conducted from September 2024 to November 2024. A total of 100 respondents were selected. Data were collected using self-administered structured questionnaire consisting of information about socio-demographic data, information about personal history of respondents and knowledge about the screening of cervical cancer for its early detection. After collection of data, it was checked, verified, and edited to reduce inconsistency. The data were processed by computer and statistical analysis of data was carried out by using SPSS 25 (Statistical Package for Social Science). Only the prevalence of knowledge about the cervical cancer screening was done in this study.

Study Population

Study population were female teachers, female staffs, female guardians and female students of reproductive age group from 15-49 years of age which is defined by WHO as reproductive age for women.

Inclusion Criteria

1. Women of reproductive aged from 15-49 years
2. Those who were willing to participate

Exclusion Criteria

1. Those who were not willing to participate
2. Those who were absent at the study place on data collection day

Study Place

The study was carried out among the respondents of Novelty School and College, Dhaka South City Corporation. Study place was selected purposively according to the convenience of the investigator.

Limitations of the study

1. The survey was limited to selected urban area of Dhaka South City Corporation and the respondents were selected by convenience sampling; therefore, the study cannot be considered as representative of whole population.
2. As in all questionnaire based study, this study relies only on the participants' self-reporting, which may not represent their actual practice.
3. Short time frame, limitation of funding, manpower scarcity were the shortcomings for this study.

Results

Table-1: Distribution of Respondents According to Age

Age group	Frequency
15-19 years	10 (10%)
20-24 years	18 (18%)
25-29 years	13 (13%)
30-34 years	23 (23%)
35-39 years	14 (14%)
40-44 years	11 (11%)
45-49 years	11 (11%)

The distribution of participants by age group shows that the largest proportion falls within the 30–34 years range,

accounting for 23% (n=23) of the total sample. This is followed by the 20–24year group at 18% (n=18) and the 35–39 year group at 14 (14). Both the 40–44 year and 45–49-year groups each contribute 11 (11), while the 25–29year group makes up 13 (13). The smallest representation is observed in the 15–19 year group, comprising 10 (10) of the participants. Overall, the distribution indicates a higher concentration of individuals in the 30–34-year category, with relatively fewer participants at the youngest and oldest age ranges (Table 1).

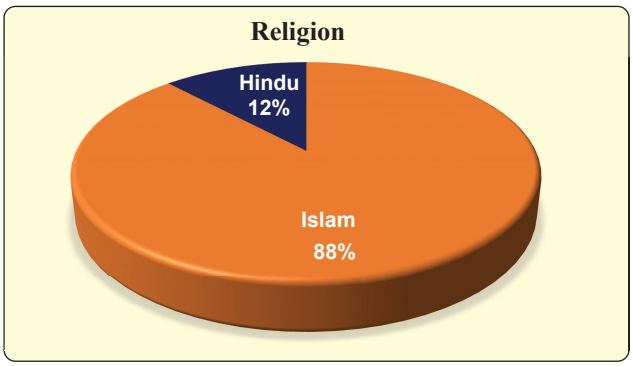

Figure-1: Distribution of Respondents by Religion (n=100)

The distribution of respondents by religion shows that majority respondents belonged to Muslim family, which is 88 (88) of the total sample, and very few participants were Hindu, comprising 12 (12) of the participants (**Figure 1**).

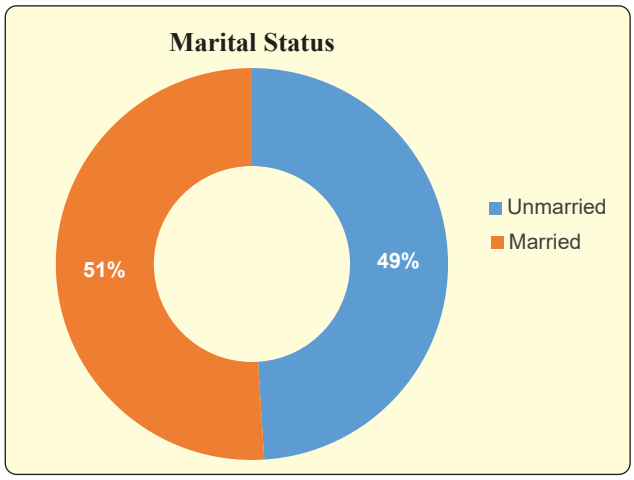

Figure-2: Distribution of Respondents According to Marital Status (n=100)

The distribution of respondents according to marital status shows that more than half of the participants were married, which is 51 (51) of the total respondents, while 49 (49) of the participants were unmarried (**Figure 2**).

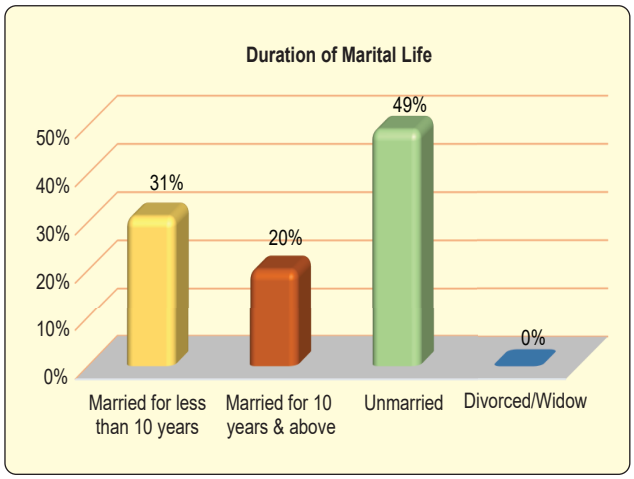

Figure-3: Distribution of respondents according to their duration of marital life (n=100)

The distribution of participants according to their duration of marital life shows that among the 100 respondents, 31 (31) respondents got married for less than 10 years, and 20 (20) women were leading their conjugal life for 10 years and above, whereas 46 (46) female respondents found unmarried. The smallest representation falls in the divorced or widow category, which is 3 (3) of the total sample (**Figure 3**).

Table-2: Distribution of Respondents According to The Source of Knowledge About Screening of Carcinoma Cervix

Source of Knowledge	Frequency
Family	11 (11%)
Relatives	1 (1%)
Medical professionals	12 (12%)
Mass media	22 (22%)
Others	5 (5%)
Have no knowledge about Ca-cervix screening	49 (49%)

The distribution of respondents according to the source of knowledge about screening of carcinoma cervix represents information about which we should concerned that 49 (49) participants, which is majority of the sample, did not know about the screening of cervical cancer.22 (22) respondents had knowledge about screening test through the mass media. Family members and medical professionals play important role in raising concern about screening of cervical cancer, which

contributes 11 (11) and 12 (12) of the sample accordingly. Very few participants, which is about 5 (5) of the total sample, knew from other source and only 1 (1) respondent heard about ca-cervix from relatives.

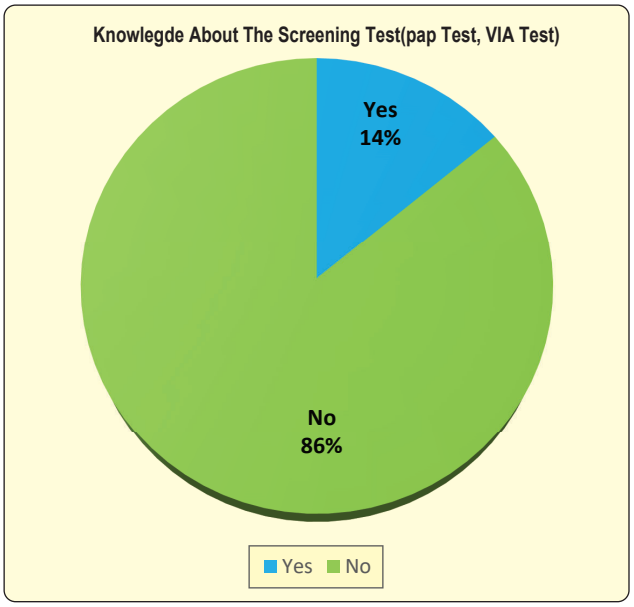

Figure-4: Distribution of Respondents According to Their Knowledge About Different Types of Screening Test (PAP test, VIA test) (n=100)

The distribution of respondents according to their knowledge about different type of screening test (PAP test, VIA test) shows that among the 100 respondents, very few 14 (14) respondents could share their knowledge about PAP test, VIA screening test and majority of the participants which is 86 (86) of the total sample had no knowledge about the different way for cervical cancer screening like PAP test, VIA test etc. (**Figure 4**).

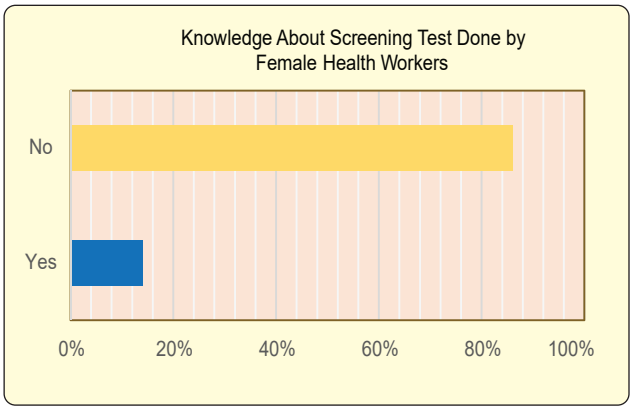

Figure-5: Distribution of Respondents According to Their Knowledge About Screening Test Done by Female Health Workers (n=100)

The distribution of respondents according to their knowledge about screening test done by female health workers shows that, only 14 (14) participants had idea about screening test done by female health workers; whereas majority of the study population which is 86 (86) of the sample had no knowledge that screening test of cervical cancer is perform by female health workers. (**Figure 5**)

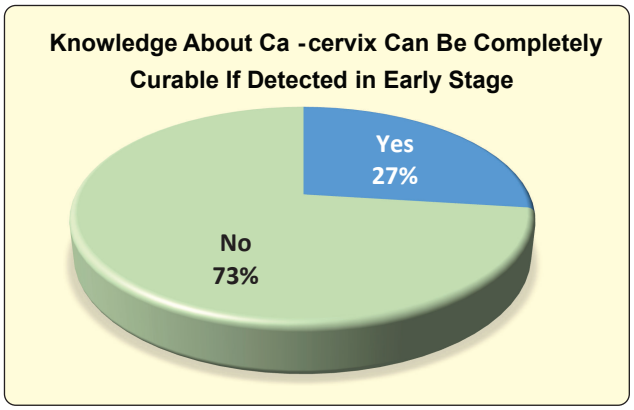

Figure-6: Distribution of Respondents According to Knowledge About Cervical Cancer Can Be Completely Curable If Detected in Early Stage (n=100)

The distribution of respondents according to knowledge about cervical cancer can be completely curable if detected in early stage shows that, very few women of reproductive age group which is 27 (27) of the sample knew that cervical cancer can be completely curable if detected in early stage and we should raise our concern that about 73 (73) of the total respondents had no idea about high survival rate of cervical cancer is possible if detected in early stage by screening. (**Figure 6**)

Discussion

In this cross-sectional study, all of the respondents gave average feedback about the knowledge of the screening of cervical cancer for its early detection. In this study, participants were from reproductive age group (15-49 years). Among 100 respondent majority 23% were 30-34-year-old which is similar to the findings of another study done in Dhaka where highest proportion 35% of women belonged to the age group 31- 34 years.[11] 88% respondents were Muslim. More than half of the participants 51% were married which is slightly more than another study where 46.3% study population were married.[12] 20% women were married for 10 years and above.

49% participants had no knowledge about the screening of cervical cancer which is resembles to another finding where approximately 40% of respondents did not know that not adhering to cervical cancer screening could be seen as a risk factor.[13] Only 14% could share their knowledge about PAP test, VIA screening test which differ from another study in Dhaka where half 50% respondents had sufficient knowledge about different types of screening test.[14] 14% respondents mentioned that they knew screening test is done by female health workers. 27% women of reproductive age group share their knowledge about cervical cancer which can be completely curable if detected in early stage which differ from a study done at Ethiopia where 43% participants share their knowledge about the early detection of cervical cancer.[15] Public health campaigns can significantly contribute to raise the knowledge about screening of carcinoma cervix. The outcomes of this study might be helpful for the implementation of future health program to increase awareness among the women of our society.

Conclusion

The cervical cancer is a deadly cancer that clutches lives of the women in most of the cases due to lack of consciousness. An important aspect of cervical cancer prevention is public awareness in the female population. Public health program about cervical cancer including its existence, risk factors, symptoms, screening and vaccination should be conducted widely by social media and community-based health education program. January is declared as the cervical health awareness month, nationwide effort to encourage on cervical health awareness can make it possible to get rid of the burden of cervical cancer disease. It was encouraging that most of the interviewed women expressed an interest in knowing more about cervical cancer and wanted to come to come health center for health check-up and for screening if any is provided. It will be beneficial to plan studies to be carried out with larger sample groups in determining level of knowledge about the screening of cervical cancer and its prevention. Study findings could also be used to informed and facilitate the Government strategy regarding cervical cancer.

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Original Article

Impact of Status of Residence on Infant with Respiratory Tract Infections

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Abstract

Background: Respiratory tract infections (RTIs) are a leading cause of morbidity in infants, influenced by socio-demographic and environmental factors.

Objective: This study aimed to evaluate the impact of residence status with RTIs during the first year of life in Bangladesh, with insights applicable to similar settings globally.

Materials and Methods: This longitudinal, community-based observational study was conducted at the Institute of Child and Maternal Health (ICMH), Dhaka, from January 2015 to December 2016. A cohort of 308 newborns was enrolled, with 212 completing the 12-month follow-up. Data were collected through structured questionnaires, interviews, and clinical examinations. Socio-demographic variables, including housing status and residence level, were analyzed using chi-square and logistic regression tests. The study compared RTI prevalence between infants residing in ground-level homes, including tin-shed structures, and those in upper-floor residences.

Results: RTI prevalence was significantly higher among infants living in ground-level homes (71%), especially in tin-shed structures, compared to those in upper-floor residences 148 (28.5%) (χ^2=3.13, df=1, p<0.043). Male infants 115 (55.5%) showed a higher susceptibility to RTIs than females 92 (44.5%). The cohort predominantly consisted of nuclear families 171 (83%), with most infants having up to two siblings. Socio-demographic factors, including mode of delivery, parental consanguinity, and housing type, were associated with varying RTI patterns, highlighting the critical role of environmental exposures.

Conclusion: Residence level significantly influences infant RTI prevalence, with ground-level living posing higher risks in resource-limited settings. Addressing housing quality, pollution control, and equitable healthcare access is essential to mitigate RTI burdens in infants, Bangladesh.

Keywords: Status of Residence; Infants; Respiratory Tract Infection.

Introduction

There are approximately 3.4 million infants in Bangladesh, representing about 33% of the nation's total child population.[1] Respiratory tract infections (RTIs) remain a significant contributor to infant morbidity and mortality worldwide, with disparities influenced by socio-environmental factors, one of them is the level of residence.[2] Rural and urban living conditions distinctly affect exposure to environmental pollutants, healthcare accessibility, and socioeconomic variables, shaping the epidemiology of infantile RTIs.[3]

This longitudinal follow-up study addresses the limited understanding of how residence level influences infant RTIs, particularly in low-resource settings like Bangladesh. By focusing on environmental and socio-demographic factors, it fills a research gap in identifying preventable risks, guiding targeted interventions to reduce infant morbidity and mortality.

Globally, RTIs are among the leading causes of mortality in children under five, accounting for approximately 15%

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Received Date : 10 January, 2025
Accepted Date : 2 February, 2025

of all deaths annually, with infants being the most vulnerable group due to their underdeveloped immune systems.[4] Variations in residence significantly affect RTI incidence and prevalence. Rural areas, often characterized by biomass fuel use, overcrowding, and limited healthcare access, demonstrate higher RTI prevalence than urban regions.[5] Conversely, urban environments pose risks of pollution-induced respiratory diseases due to industrial emissions, vehicular exhaust, and poor ventilation.[6,7]

In South Asia, including Bangladesh and India, RTI prevalence in infants is compounded by high population density, inadequate sanitation, malnutrition, and poor-quality healthcare access.[8,9] Bangladesh reports RTI incidence rates ranging from 28% to 40% among infants, particularly in rural and slum areas where poverty, indoor air pollution, and lack of maternal education heighten vulnerability.[10,11] Similar trends are observed in India, where biomass fuel exposure and outdoor air pollution contribute to a heightened RTI burden among children under five.[12,13]

In contrast, European countries and the USA show comparatively lower RTI prevalence due to improved healthcare infrastructure, immunization coverage, and cleaner environments; however, urban centers in these regions still report substantial RTI cases linked to traffic-related air pollution, allergens, and social inequalities.[14]

Understanding the interplay between residence characteristics and RTI burden is crucial for pediatric specialists, public health professionals, and policymakers to develop targeted prevention strategies and optimize healthcare delivery. By analyzing epidemiological trends, this study underscores how residence-level disparities influence infant respiratory health across diverse global contexts.The aim and objective was to evaluate the impact of residence status with RTIs during the first year of life in Bangladesh, with insights applicable to similar settings globally.

Materials and Methods

This was an observational study conducted to evaluate the impact of residence status on infant respiratory tract infections (RTIs). The study was carried out at the Institute of Child and Maternal Health (ICMH) in Matuail, Dhaka, Bangladesh, over two years from January 2015 to December 2016.

A total of 384 healthy infants born in the Gynecology and Obstetrics Department of ICMH were initially enrolled, with 212 completing the first year of life with adequate follow-up. Purposive sampling was employed to ensure the inclusion of diverse socio-demographic groups. Data were collected using semi-structured questionnaires, face-to-face interviews, detailed history-taking, physical examinations, & appropriate diagnostic investigations.

Infants were monitored through a structured surveillance system, including monthly scheduled visits and additional visits as required. A total of 3,696 infant-months of observation were achieved, with 212 infants completing the 12-month follow-up, yielding 2,544 infant-months of data.

During the surveillance period, 3,846 communication points were recorded, including 478 physical visits and 3,368 telephone follow-ups. The dataset excluded instances where multiple phone calls or physical visits occurred for the same illness episode, which were estimated to be threefold higher than the recorded counts.

This methodology ensured a comprehensive evaluation of the relationship between levels of residence and infant RTIs, providing insights into the epidemiological factors affecting respiratory health in infants in the region.

Statistical Analysis- Baseline socio-demographic characteristics were descriptively analyzed for the 212 infants. Statistical analysis was conducted to compare categorical variables using chi-square or Fisher's exact tests, while discrete and continuous variables were analyzed through logistic regression. Data management and analysis were performed using SPSS software, version 22.

Result

This longitudinal study aimed to assess the Impact of status of Residence on Infant RTI among a birth cohort while analyzing variations based on socio-demographic factors. Conducted at the Institute of Child and Maternal Health (ICMH), Dhaka, Bangladesh, from January 2015 to December 2016, the study enrolled 308 newborns and successfully followed up with 212 infants for the first 365 days of life.

Of the analyzed cohort, 115 (55.5%) were male, and 92 (44.5%) were female. Mode of delivery showed that 159 (75%) infants were born via cesarean section (CS), and 53 (25%) via vaginal delivery (VD). The mean birth weight was 2903 ± 400 grams, mean birth length was 48 ± 2.5 cm, and mean occipitofrontal circumference (OFC) was 33 ± 2 cm.

This comprehensive dataset highlights the critical role of socio-demographic and environmental factors in shaping the respiratory health of infants, providing

valuable insights for targeted interventions to reduce respiratory disease burden in similar settings.

Table-1: Demographic characteristics of the study participants

Demographic scenario	Number (%)
Gender	
Male	115 (55.50)
Female	92 (44.50)
Residents	
Live in Tin shed house	106 (51)
Ground floor of building	42 (20)
Live in1st floor	32 (15.5)
Live in 2nd floor and above	27 (15.5)

The study included 212 participants, demographic scenario of which 115 (55.5) were male and 92 (44.5) were female. Regarding housing conditions, 106 participants (51) lived in tin-shed houses, while 42 (20) resided on the ground floor of a building. Additionally, 32 participants (15.5) lived on the first floor, and 27 (13) resided on the second floor or above.

Table-2: Sibling number in families

Sibling number	Number (%)
Upto 02	171(83)
Upto 04	31(15)
Upto 06	05(02)

The majority of families, 171 (83), had up to 2 siblings, indicating smaller family sizes were most common. A smaller proportion, 31 (15), had up to 4 siblings, showing moderately sized families were less frequent. Only 5 (2) families reported having up to 6 siblings, indicating that large families were rare in this sample.

Table-3: Family members

Family member	Median	Maximum	Minimum	Mode
Member	09	21	03	04

The table shows the distribution of family members among the study participants. The median family size was 9 members, with a minimum of 3 and a maximum of 21 members per family. The mode was 4, indicating that families with 4 members were most common.

Table-4: Inferential statistics on Respiratory tract infection and residence

	Respiratory tract infection		P value
	Up to 6 episodes	> 6 episodes	
Residence at ground level	46 (22%)	102 (49%)	0.043
Residence above ground level	26 (12.5%)	33 (16%)	

The table presents the relationship between respiratory tract infection (RTI) episodes and type of residence. Among the 207 participants, 72 (35) experienced up to 6 episodes of RTI, while 135 (65) had more than 6 episodes. Out of those living at ground level (tin-shed or ground floor), 46 (22) reported up to 6 episodes and 102 (49) reported more than 6 episodes, totaling 148 (71.5). In contrast, among participants living above ground level, 26 (12.5) had up to 6 episodes and 33 (16) had more than 6 episodes, totaling 59 (28.5).

The analysis indicates a higher prevalence of RTI among those residing at ground level. The association was statistically significant ($\chi^2 = 3.13$, df = 1, $P < 0.043$).

Discussion

This study evaluated the impact of residence status on infant respiratory tract infections (RTIs) in Bangladesh, revealing a higher prevalence of RTIs among infants residing in ground-level homes, particularly in tin-shed structures (Table 1). Our results showed that nearly two-thirds (64%) of infants from ground-floor and tin-shed dwellings experienced more than six RTI episodes during the first year of life (Table 1). This finding is consistent with regional studies demonstrating that infant RTI prevalence ranges between 55% and 70% in low-income South Asian communities, where overcrowding, poor ventilation, and biomass fuel exposure are prevalent risk factors.[15,18]

A large-scale study from rural India reported that 58% of infants living in ground-level or poorly ventilated houses experienced at least one RTI episode within the first year, compared to 32% in upper-floor or well-ventilated homes.[20] Similarly, a Bangladeshi cohort study found that 61% of infants from tin-shed dwellings experienced recurrent RTIs, compared to 38% from concrete houses, supporting our findings that lower-level, poorly ventilated residences increase infant susceptibility (Table 4). Other studies in Dhaka and Chattogram also reported that children from low-income, tin-roofed, and

congested homes had 1.8 to 2.5 times higher odds of developing respiratory infections compared to those from brick-built or multi-storey houses.[23] These results indicate that structural and environmental conditions at the household level significantly contribute to early-life respiratory morbidity in developing countries.

In contrast, findings from high-income countries such as those in Europe and the USA demonstrate different trends. In urban settings of London and New York, studies have shown that apartment-dwelling infants have a 25–30% higher risk of respiratory infections compared to those in suburban homes, primarily due to exposure to traffic-related air pollution, indoor particulate matter, and allergens.[24] For example, a UK birth cohort study found that infants exposed to PM (Perticuler Matter measred im micro meter) levels exceeding 25 μg/m^3 had a 1.4-fold increased risk of recurrent lower RTIs, while a US-based study reported that high-rise urban dwellings were associated with nearly double the odds of wheezing illnesses before age one.[22] These global data reinforce the principle that while the source of environmental exposure may differ—biomass combustion in developing countries versus industrial and vehicular emissions in developed nations—the impact on infant respiratory health remains universally significant.

The predominance of nuclear families (Table 3) and lower sibling counts in our cohort (Table 2) may have mitigated household transmission of infections. This observation aligns with global research showing that each additional child in a household can increase the odds of RTI transmission by 20–30%, particularly in shared sleeping environments.[17,19] The male predominance (55.5%) in RTI cases (Table 1) is also notable and parallels findings from South Asian studies reporting male-to-female ratios of 1.2–1.4:1, attributed to both biological vulnerability and gender-based disparities in care-seeking behavior.[21] Although our study did not perform inferential statistical analysis on gender variation, this remains an important consideration for future research.

A total of 212 infants were followed over the study period, out of 308 originally enrolled. The dropout rate of 31% represents a limitation and may have introduced attrition bias. Additionally, factors such as urban–rural disparities, seasonal fluctuations, and air quality were not quantitatively assessed. Therefore, while our findings highlight key environmental and socio-demographic determinants of infant RTIs (Table 4), their generalizability may be limited to comparable low-income urban and peri-urban populations.

Future studies should incorporate air quality indices, household ventilation metrics, and quantitative exposure assessments to strengthen causal inference. Nevertheless, our findings emphasize that residence type and housing elevation are critical determinants of early-life respiratory health. Improving housing standards, promoting upstairs or well-ventilated living environments, controlling indoor and outdoor air pollution, and ensuring equitable healthcare access remain essential strategies to reduce the global burden of RTIs among infants.

Weaknesses of the study were only 212 of the 308 enrolled infants completed the study, potentially introducing bias, because of small sample size. These outcomes are not universally relevant to varied economic and social conditions. Air quality and seasonal variations were not quantitatively assessed.

Upstairs living, improving housing conditions, controlling air pollution, and ensuring equitable healthcare access remain essential strategies to reduce the RTI burden among infants globally.

Conclusion

This study demonstrates that residence status significantly affects the risk of respiratory tract infections in infants during their first year of life in Bangladesh. Infants living in ground-level homes faced a higher prevalence of RTIs, emphasizing the influence of socio-demographic and environmental factors like housing conditions. These findings highlight the importance of improving living environments, reducing air pollution, and ensuring equitable access to healthcare to lessen the burden of RTIs.

Recommendations

Improve ventilation and housing in ground-level and tin-shed homes, control air pollution, and educate families on reducing environmental risks to protect infant respiratory health. Where possible, encourage living above ground level to lower exposure to pollutants. Further large-scale cohort studies with greater sample sizes are needed to deepen our understanding of these associations and guide effective interventions.

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Original Article

Rate and Pattern of Death due to Poisoning in Sir Salimullah Medical College during COVID-19 Pandemic

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Abstract

Background: The COVID-19 pandemic caused global disruptions, significantly impacting people's daily lives, social habits, and overall physical and mental health. These stressful changes are known to influence patterns of self-harm and accidental injury, creating a unique context for studying toxicological fatalities.

Objective: The study aimed to evaluate the patterns and rates of poisoning-related deaths autopsied at a Sir Salimullah Medical College hospital in Dhaka, Bangladesh, during the COVID-19 pandemic period.

Materials and Methods: A two-year retrospective study of poisoned deaths was conducted by the Department of Forensic Medicine & Toxicology, reviewing post-mortem records and police inquest reports from January 2020 to December 2021. The goal was to profile the deaths and compare findings with pre-pandemic studies.

Result: A total of 272 suspected poisoning cases were autopsied. Organophosphorus Compounds (OPC) were the most prevalent agent (59.5%), followed by alcohol/rectified spirit (10%). The majority of victims were men (64.3%), but women represented a significant portion (35.7%). The highest rate of poisoning was found in the 21–30 year age group (31.5%). Students and housewives were the most affected occupational groups. Family discord was the leading motive, accounting for 22.3% of cases.

Conclusion: The COVID-19 epidemic altered the pattern of poisoning cases, with the lockdown situation contributing to a rise in suicides. Quick action is imperative from healthcare professionals, legislators, and mental health support providers, especially targeting women and those in vulnerable age groups, to mitigate these risks.

Keywords: COVID-19; Poison; Suicide; Poisoning Pattern; Autopsy; Pandemic.

Introduction

Poison is a substance solid, liquid or gaseous which introduced into the living body or brought into contact with any part thereof, will produce ill health, disease, or death by its constitutional effects, local effects or both. [1]

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Received Date : 14 May, 2025
Accepted Date : 10 June, 2025

A serious global public health issue, poisoning has a high rate of morbidity and mortality across all age and sex categories. Because of socioeconomic considerations, cultural diversity, the growth of agricultural activities, and the use of agrochemicals, this is more prevalent in low- and middle-income nations.[2] Generally children are more vulnerable to accidental poisoning, whereas young adults are more committed to suicidal poisoning attempts.[3] All unnatural deaths-whether suicide, accident, or homicide-represent a terrible loss of valuable resources and human life.[4] Ingestion of pesticides also contributes to suicide deaths in developed nations.[5,6] Bangladesh is one of South East Asia's most populous emerging nations with a strong agricultural economy. Because pesticides and insecticides are widely used, easily accessible, and inexpensive in rural areas, the number of acute

poisoning-related deaths and hospital admissions in our nation is rising. According to a few studies, sleeping pills, or sedative drugs, rank second to pesticides as the most frequently utilized chemical agent for acute poisoning in our nation. Additionally, sedative medications, copper sulphate, kerosene, insecticides, pesticides, Herpic (toilet cleaner), etc. are frequently employed poisons for acute poisoning in our nation.[7,8] Though it may vary in different parts of the world even may be in different regional variations in same country. Hence, this study was undertaken to evaluate the age, sex, common poison used and pattern of poisoning found in this rural area.

Materials and Methods

Between January 2020 and December 2021, a retrospective study was carried out that included 272 poisoning cases that were autopsied in the mortuary of Sir Salimullah Medical College Hospital in Dhaka. The information is gathered from post-mortem and inquest reports. The resulting data was evaluated, and the study was conducted in terms of the distribution of age and sex, the cause of death, post-mortem results, and ligature findings. The police inquest report included information regarding the crime scene. SPSS was used for analysis once the gathered data was collated on a master chart. Responses were automatically compiled by SPSS analyzed using descriptive statistical methods. Data were presented in the form of frequency distributions and percentages, which were visualized through charts and graphs. Each figure represents one key variable of the study.

Result

Table-1: Socio-Demographic Characteristics

Variables	Number (%)
Age group (Years)	
10-20	70 (25.7)
21-30	86 (31.5)
31-40	60 (22)
41-50	38 (13.9)
51-60	11 (4)
61-70	8 (2.9)
Marital Status	
Married	182 (66.9)
Unmarried	90 (33.1)
Gender	
Male	175 (64.3)
Female	197 (35.7)
Religion	
Muslim	254 (93.3)
Hindu	18 (6.7)
Occupation	
Student	62 (22.7)
Housewife	60 (22.5)
Unemployed	35 (12.8)
Businessman	31 (11.3)
Labor	17 (6.2)
Service	16(5.8)
Mechanic	10 (3.6)
Farmer	10 (3.6)
Rickshaw Puller	10 (3.6)
Driver	7 (3.5)
Addicted	4 (1.4)
Servant	4 (1.4)
Thief	2 (0.8)
Car Mechanic	2 (0.8)

Table-1: Socio-Demographic Characteristics (Cont'd)

According to our observations, the largest percentage of data 86 (31.5%) came from the age group of 21 to 30. The lowest percentage 8 (2.9%) was found among those aged 61 to 70. Of the 272 cases, the majority were married 182 (66.9%), and 64.3% of the cases were male Muslims 254 (93.3%). We conducted this study on a number of people in a variety of occupations, and the highest number of cases were discovered among housewives 60 (22.5%) and students 62 (22.7%). Thieves 2 (0.8%) and auto mechanics 2 (0.8%) had the lowest numbers.

Table 2: Reason Behind the Cases

Cause	Number (%)
Familiar disharmony	60 (22.3)
Arrogance	50 (18.5)
Poverty	49 (18.3)
Depression	35 (12.6)
Mental Unsoundness	22 (8)
Anger	15 (5.5)
Occasional Ingestion	15 (5.5)
Chronic Illnesses	13 (4.7)
Argument	9 (3.3)
Snake Bite	2 (0.7)
Travellers Poison	2 (0.7)

Maximum cases were observed due to Familial disharmony 60 (22.3%) followed by Arrogance 50 (18.5%).

Table -3: Month-Wise Distribution

Month	Number (%)
January	29 (10.6)
February	15 (5.5)
March	12 (4.4)
April	19 (6.9)
May	18 (6.6)
June	25 (9.1)
July	17 (6.2)
August	34 (12.5)
September	39 (14.3)
October	30 (11)
November	30 (11)
December	22 (8)

Majority of the cases were noticed in month of September (14.3%) but in month of February (5.5%) which was minimal.

Table-4: List of Police Stations

Police stations	Total counts
Kotoali	130
South Keraniganj	20
Kadamtoli	8
Nawabganj	20
Gandaria	11
Kodomtoli	10
Badda	4
Keranigonj Model Thana	12
Dohar	8
Lalbagh	3
Kamrangir Char	22
Shampur	4
Jatrabari	5
Chawkbazar	2
Wari	6
Hazaribagh	3
Bongshal	3
Dakshinkhan	1

We carry out our observation among the police stations in the year of 2020 1st number 01 case noticed in Dokkhin Khan.

Table-5: Poisoning Cases

Poison	Number (%)
OPC	162 (59.5)
Alcohol	28 (10)
Aluminium Phosphate	18 (6.5)
Cypermethrin	16 (5.6)
Paraquat	11 (4)
Benzodiazepine	11 (4)
Zinc Phosphate	8 (2.9)
Bramadiolone	4 (1.4)
Hydrochloride	4 (1.4)
Salicylic Acid	3 (1.1)
Snake bite	2 (0.2)
Calcium Arsenide	2 (0.7)
Carbon Monoxide	2(0.7)
Hydro-cyanide	1 (0.3)
Aeroxen Weed Keeler	1 (0.3)
Corrosive	1 (0.3)
Kerosene	1 (0.3)
Phensedyl	1 (0.3)

Of the 272 poisoning instances OPC poisoning accounted for the most instances, 162 (59.5), followed by alcohol 28(10%).

Discussion

The COVID-19 pandemic has had a profound impact on people's mental health. Throughout the pandemic, a number of factors exacerbate people's psychological states, including fear of an uncertain future, economic downturn, loss of jobs and income, ambiguity, losing a family member, loneliness, etc. Additionally, the government's constant changes to its COVID-19 limits and social media misrepresentations cause public fear, which in turn causes anxiety and despair.[9] The significant rise in the number of hospitalized patients from 2019 to 2021, from 1834 to 2457, is an intriguing trend. These results were in line with another study from 2021, where it is reported that calls relating to poisoning exposures increased by 91% during the 2020 lockdown as compared to 2019.[10] Additionally, similar findings have been reported by poison centers in France, the United States, and Canada.[11] The alterations in behavior brought on by a dread of COVID-19, excessive housecleaning, and improper use of cleaning supplies for personal hygiene or food cleanliness. Additionally, isolation measures that led to a decline in cognitive abilities and decision-making, along with an increase in

impulsivity, are another problem that contributed to this increase. In terms of demographic data, the COVID-19 pandemic had an impact on the age distribution, and the mean age of admitted patients rose annually. The percentage of children under 7 years old increased from 11.7% in 2019 to 16.5% in 2020 before declining to 12.41% in 2021. In contrast, a research in 2023 reported a notable decline in this age group.[13] Additionally, the percentage of toxicity among school-age children (7–15) increased from 16.6% in 2019 to 19.66% in 2020 before falling to 17.87% in 2021. Adults with mood and anxiety issues during the lockdown experienced more problems as parents, which resulted in lower-quality care for children when schools were closed. Over the course of the study, the percentage of people in the 15–25 age group climbed significantly among all age groups, rising from 33.32% in 2019 to 34.5% in 2020 and 34.67% in 2021. Fayed and Sharif (2021) found similar results, showing that during the epidemic, adults experienced a higher number of toxicities.[15] In addition to stress brought on by the pandemic, the rise may be the result of their increased risk of being exposed to harmful substances in the general environment and at work.[16] The economic effects of the pandemic, which resulted in unemployment and worsened living conditions for men, caused the male to female ratio to first rise before tending to normalize in 2021.[17] Multifaceted mental health issues that are commonly linked to the morbidity and mortality of the COVID-19 pandemic may be the cause of the rise in suicide rates during the outbreak. The COVID-19 pandemic caused between 2135 and 9570 suicides annually worldwide, in addition to job losses.[17] Poisoning deaths are typically accidental or suicidal in nature. Organophosphorus compounds are the most frequently utilized substances for suicidal purposes. Chemicals like paraquat, parathion, and acetic acid are used to make rubber in South-East Asia, whereas opium, diazepum, and barbiturate are utilized for self-destruction. Dichlorvos (76% EC) is also utilized as an injectable suicide drug, according to an Indian study.[18,19,20] Some common observations made during post-mortem examinations of poisoning instances included the research subjects' cyanosis in the nose, lip, and finger, blood-stained froth in the mouth and nostrils, and the odd smell of OPC in the stomach contents. Every single organ was clogged. The stomach had a submucosal petechial hemorrhage. Additionally, there was subpleural peechial hemorrhage and excessive oedema.[21] Our nation's farmers apply pesticides without understanding the negative consequences. In Bangladesh, the most often used pesticides are synthetic pyrithroid, ogano carbamate, and organophosphate[22]. Spanish epidemiological research confirms the association between long-term OPC exposure and a higher risk of suicide.[23] Chronic Organo Phosphate Induced Neuro-Psychiatric Disorder (COPIND) is another illness that is brought on by prolonged exposure to OPC.[24,25,26] In situations of chronic OPC poisoning, genetic variations are also significant[27].Kerala 25 has the highest suicide rate in the state. The majority of victims are between the ages of 14 and 34, and OPC was the most often utilized substance for suicide.[28] In Sri Lanka, pesticide poisoning causes thousands of hospital admissions annually (16,649 in 1983) and more than 1,000 fatalities (1521 in 1983). About three-quarters of these are self-administered, with the remaining percentage being accidental and occupational.[29,30] According to a previous study conducted at our same study institute in Bangladesh between January and December 2009, 59% of all suicidal fatalities were caused by hanging, 31% by poisoning, and 10% by other causes such as burns, falls from heights, gunshot wounds, etc.[31]

Conclusion

The present study offers valuable insights into how the COVID-19 pandemic influenced the rate and pattern of poisoning deaths at Sir Salimullah Medical College. Findings revealed notable shifts in poisoning trends, with a rise in exposures to household chemicals, corrosives, and phosphides, particularly during lockdown periods, while drug overdose cases showed a decline in 2020 compared to 2021. The increase in phosphide poisoning and suicide-related cases may be attributed to the psychological and socio-economic stressors associated with lockdown restrictions. These observations highlight the crucial need for enhanced public awareness, stronger mental health and substance abuse interventions, and improved healthcare access during crises. The study underscores the importance of adopting an interdisciplinary and integrated approach that combines healthcare, community support, and policy-level measures to effectively prevent and manage poisoning deaths during and after global emergencies like the COVID-19 pandemic.

Source of Funding

For this research, no specific grant from a governmental, private, or nonprofit funding agency was acquired.

Conflict of Interest

The author declares no conflicts of interest.

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Original Article

Two-Years Retrospective Study of Medicolegal Cases at Sir Salimullah Medical College, Dhaka

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Abstract

Background: Madicological cases of sexual offences encompass behaviours such as verbal sexual harassment, compulsion, and forced penetration. Sex-related crimes are the most heinous and degrading of all the crimes. The most vulnerable demographic to this crime is still women and children. A significant public health issue is the startling increase in the incidence of sexual assault on a global scale.

Objective: The current study's goal was to identify the medicolegal findings of sexual offence victims in order to highlight the procedure's obvious flaws.

Materials and Methods: The data acquired from Sir Salimullah Medical College, Hospital between January 2022 and December 2023 was prepared rigorously. Informed written consent, four copies of passport-size photos, the victim herself, the authority's requisition, and a third person female attendant, collected information on 166 victims, including the cause, location, time, and date of the examination.

Results: 61.5% of the patients were between the ages of 11 and 20. 130 cases (80.2%) out of 162 were unmarried. The majority were students (44.6%) and housewives (20.5%). Significant monthly variations were discovered by the study, with January, March, and April showing the highest values.

Conclusion: Collectively evidence is a crucial responsibility for doctors. Insufficient medical evidence frequently contributes to a low conviction rate. Because of this, it is vitally important to conduct a proper and suitable physical examination in situations of sexual offence, and the analysis of preserved biological specimens like blood and semen frequently provides essential evidence in modern criminal investigations.

Keywords: Medicolegal; Victim; Rape; Retrospective study.

Introduction

Any sexual act, attempt to obtain a sexual act unwanted sexual comments or advances, or acts to traffic or otherwise directed against a person's sexuality using coercion, by any person regardless of their relationship to the victim, in any setting, including but not limited to home and work," is what the World Health Organization (WHO) defines as sexual violence.[1] One type of natural sexual crime that occurs frequently worldwide is rape. Rape is a legal word and not a diagnosis that the examining physician should make.[2] Rape is the illegal sexual contact between a man and a woman without the woman's agreement, against her will or with her assent gained by coercion, fear, or deception, or with any women under the age of fourteen.[3] Rape can occur at any age. However, minors are more likely to be raped because they are less resistant and because it is believed that having sex with a virgin will cure venereal diseases.[4] According to the Bangladesh Penal Code six different aspects of special considerations are laid down.[5] Rape occurs when the penis is little penetrated within the vulva, such as when the glans barely passes through the labia, with or without semen leaking out or the hymen rupturing.[6] According to The Penal Code-376, the punishment for rape is either life in prison or ten years in prison with a fine; however, in the case of a wife, the punishment is either two years in prison or a fine, or both.[7] Sexual crimes like rape can happen to anyone at any age. Due to the superstitious idea

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Received Date : 14 March, 2025
Accepted Date : 03 April, 2025

that having sex with a virgin would cure sexually transmitted diseases (STDs), children are frequently the victims. A female is more likely to be a virgin if she is younger.[8] Under Section 160 of the Criminal Procedure Code of 1898, women are not permitted to be called to the police station for questioning.[9] A raped woman even has the right to record her statement in front of the magistrate in secret so that no one else can overhear it. Additionally, she is free to record her statement in private with a female constable or a police officer. Police officers are required by section 164 of the Criminal Procedure Code to respect the victim's privacy without making her feel anxious in front of large crowds.[10] According to Section 228-A of the Indian Penal Code, disclosing a victim identify is illegal.[11]

Materials and Methods

This retrospectivepi study was carried out between January 2022 and December 2023 in the Department of Forensic Medicine at Sir Salimullah Medical College and Mitford Hospital in Dhaka, Bangladesh, while adhering to ethical guidelines. Rape victims who consented to undergo medicolegal examinations were listed as alleged sexual assault victims. Within the time frame (January 2022 to December 2023) stated above, victims of alleged rape cases were referred for medicolegal examinations. Following a physical examination, the presence or absence of symptoms of forcible sexual contact was determined by the radiological and microbiological reports. The differences in the occurrence of violence against women over the months of the year were meticulously examined using a single-factor analysis of variance (ANOVA). Finding out if there were any statistically significant variations in the average frequency of violence over various months was the aim of this well-planned analytical procedure. A comprehensive analysis employing the Pearson correlation coefficient was conducted in order to investigate the intricate relationship that exists between age and the likelihood of cases being filed. A predetermined alpha threshold ($\alpha < 0.05$) was used to determine statistical significance for the ANOVA test and Pearson correlation analysis. The specific objective of this analytical endeavour was to measure the direction and strength of the naturally occurring linear association between age and the probability of filing cases. If the computed p-values were less than this predetermined threshold, the results were carefully regarded as statistically significant in accordance with standard statistical procedures.

Results

The majority of participants belonged to the 11–20 years age group, accounting for 61.5% (n=102) of the sample. This was followed by the 21–30 years age group, comprising 24.7% (n=41). Smaller proportions were observed among the 5–10 years (4.8%, n=8) and 31–40 years (7.8%, n=13) age groups, while only 1.2% (n=2) of participants were in the 41–50 years category. Out of 166 cases we observed 50(30.1%) were married while remaining 116 (69.9%) were unmarried. In our study, the majority (97.6%) were Muslims, whereas the only (2.4%) were Hindus. In our observation, no data were found among Christians or Buddhists. This study involved a number of participants in a variety of occupations, and the highest percentage of instances were observed among students (44.6%) and housewives (20.5%). Whereas, teachers had the lowest number (1.2%).

Table 1: Socio-demographic characteristics

Variables	Number (%)
Age group (Years)	
5-10	8 (4.80)
11-20	102 (61.50)
21-30	41 (24.70)
31-40	13 (7.80)
41-50	2 (1.20)
Marital Status	
Married	50 (30.10)
Unmarried	116 (69.90)
Religion	
Muslim	162 (97.60)
Hindu	4 (2.40)
Occupation	
Student	74 (44.60)
House wife	34 (20.50)
Servant	22 (13.30)
Service	21 (12.60)
Unemployed	9 (5.40)
Business	4 (2.40)
Teacher	2 (1.20)

The most frequently cited reason was breach of promise (31.9%), followed by deception (22.3%) and threat (21.7%). Kidnapping accounted for 16.3% of the cases, while intoxication was reported in 6% of instances. Gang rape was the least reported reason, representing 1.8% of the total cases.

Table 2: Reason behind the occurrence

Reason	Number (%)
Breech of promise	53 (31.90)
Threat	36 (21.70)
Kidnapping	27 (16.30)
Intoxication	10 (6.0)
Deceive	37 (22.30)
Gang rape	3 (1.80)

Table 3 shows the distribution of cases according to findings. The majority of cases showed signs of sexual intercourse (80.7%), while no sign of sexual intercourse was observed in 9% of cases. Forceful acts were reported in 6.1% of cases, and pregnancy was identified in 3.6%. The least reported finding was assault, accounting for 0.6% of the total.

Table 3: Distribution according to findings

Findings	Number (%)
Forceful	10 (6.10)
Sign of sexual intercourse	134 (80.70)
No sign of sexual intercourse	15 (9.0)
Pregnant	6 (3.60)
Assault	1 (0.60)

In 2022, we conducted an observation of the police stations and found the first number 01 case in Keraniganj. Table 4 below included the list of police stations.

Table 4: Police station wise distribution

Police stations	Total count
South Keraniganj	21 (12.65)
Bongshal	6 (3.60)
Jatrabari	44 (26.50)
Kodomtoli	14 (8.40)
Hazaribagh	8 (4.80)
Keraniganj Model Thana	40 (24.10)
Kotwali	8 (4.80)
Dohar	6 (3.60)
Gandaria	5 (3.0)
Nawabganj	6 (3.60)
Chawkbazar	5 (3.0)
Sutrapur	1 (0.6)
Wari	2 (1.2)

Data was presented as numbers with percentages in parentheses.

The majority of instances were observed in January (17.5%), with only a small number occurring in November (3.6%). As seen in Table 5 below, our cases were distributed by month.

Table 5: Month wise Distribution

Month	Number (%)
January	29 (17.50)
February	15 (9.0)
March	21 (12.70)
April	20 (12.0)
May	12 (7.20)
June	14 (8.40)
July	7 (4.20)
August	9 (5.40)
September	15 (9.0)
October	10 (6.0)
November	6 (3.60)
December	8 (4.80)

Data was presented as numbers with percentages in parentheses.

Discussion

In the majority of underdeveloped nations, sexual assault is a neglected public health concern, and the number of people reporting sexual assault is probably considerably lower.[12] Ten to fifty percent of female victim's claim having been sexually assaulted. Police investigate sexual offences with the utmost rigour, second only to murder, despite the fact that they are both frequent and extremely serious crimes.[13] Because of its serious effects on victims' physical and mental health, sexual assault is a widespread issue that has been the focus of much research. The shockingly high rate of sexual assault is a problem in many countries, including Bangladesh. According to Odhikar, a human rights organization in Bangladesh, between 2001 and 2019, at least 14,718 persons experienced sexual assault. Of those, 6,900 were women and 7,664 were children. Additionally, 2,823 incidents had a large number of offenders.[14] Many incidences of sexual assault go unreported due to societal shame, legal barriers, and a lack of support for survivors.[15] Predators of sexual violence against women have increased to include strangers, acquaintances, family members, instructors, friends, colleagues, and other non-partner people, when formerly it was restricted to cohabiting, marriage, or other personal relationships.[16] According to another survey, 90% of Bangladeshi garment workers claim that their jobs are having a detrimental effect on their health, and 80% had either witnessed or experienced sexual abuse and

harassment at work.[17] Bangladeshi police records indicate that violence against women (VAW) is a serious problem. Rape is the second most common type of VAW reported, with harassment connected to dowries being the most prevalent.[18] The pattern, intensity, and length of the violence, as well as the kind of perpetrator, all affect the impact of such violence. The effects of sexual assault can be severe and enduring, resulting in physical harm, psychological distress, and emotional trauma for the victims. Post-traumatic stress disorder (PTSD), anxiety, and depression are among the mental health conditions that victims of sexual assault are more prone to experience. In addition, sexual assault can result in STIs, unintended pregnancies, and bodily harm such cuts, bruises, and fractures.[19] Victims may experience severe psychological effects, leading to post-traumatic stress disorder with a wide range of symptoms, such as trouble sleeping, poor appetite, flashbacks, feelings of numbness, anger, shame and denial, avoidance behavior, and problems in relationships and sexual interactions. In the worst situations, depression can result in suicidal thoughts and actual suicide.[20] The American Medical Association (1995) stated that the most underreported crime is sexual violence. According to a 2007 government report in England, research estimates indicate that between 75 and 95 percent of rape incidents go unreported to the police.[21] The police conduct investigations into sexual assault, a common and extremely serious crime, with a level of severity second only to that of murder.[22] Because women are weaker than men in patriarchal societies, violence against them is more common than any other crime, including rape.[23] Many of the issues that victims of rape encounter are connected to the fact that law enforcement, hospitals, and courts are enormous bureaucracies. Loss and neglect are felt by victims. They discover that the police station, emergency room, or courthouse has its own timetable and procedures, which are frequently established more for the convenience of the employees than for the benefit of the public it is meant to serve.[24] Social stigma, prejudice over marriage prospects, press attention, judicial embarrassment, skepticism about local law enforcement, and the possibility of losing the affection and respect of society are the main causes of the underreporting of sexual assault cases.[25] Addressing the issue of sexual assault underreporting is a massive task that requires a comprehensive approach. The government of Bangladesh plays a vital role in this respect by accelerating court cases and expanding the number of forensic DNA labs in every district. The results of this study show how urgently a number of focused activities, such as public awareness campaigns, infrastructure improvements, and legal reforms, are needed. Organizing coordinated actions at the individual, community, and governmental levels is the only way to achieve meaningful progress towards creating a society that is safer and more just for everyone. Addressing the underreporting of sexual assault incidents is morally required.

Conclusion

In both primary and newspaper data, rape victims are treated as socially cursed and denied societal advantages. Physically frozen emotions, nightmares, fear, lack of confidence, and a sense of powerlessness are common psychological symptoms of rape victims. Other societal repercussions include marriage dissolution, family deprivation, deterioration, a decline in one's reputation, and a sense of social acceptance. Victims of sexual assault are children and young women. The majority of victims showed up 72 hours after the sexual assault, and genital cleansing is a significant barrier to identifying the attackers. Therefore, in the majority of cases, there were expected to be no indications of violent sexual activity. None of the high vaginal swab specimens in our investigation contained spermatozoa. Thus, early reporting without genital washing and the use of contemporary medical technology, such as DNA identification, may aid in the detection of perpetrators.

Source of Funding

This research did not receive any specific grant from funding agencies in the public, commercial or non profit sectors.

Conflict of Interest

The author declares that there is no conflict of interest.

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Original Article

Outcome of Urogenital Fistula at National Fistula Centre of Dhaka Medical College Hospital, Bangladesh

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Abstract

Background: Urogenital fistula (UGF) commonly results from prolonged obstructed labour or inadvertent surgical injuries during obstetric and gynecological procedures. Despite being preventable, UGF remains a significant cause of morbidity among reproductive-age women.

Objective: This study aimed to evaluate the clinical profile and surgical outcomes of UGF patients treated at the National Fistula Centre (NFC), Dhaka Medical College Hospital.

Materials and Methods: A retrospective observational study was conducted on 100 patients who underwent surgical repair for UGF at the NFC between January 2017- December 2019. Patients with carcinoma, radiation-induced, congenital, traumatic fistulas, rectovaginal fistulas, or complete perineal tears were excluded. Data were collected using a semi-structured questionnaire and analyzed using SPSS-25.

Result: Of the 100 cases, 47 were obstetric fistulas (Group A), 16 were iatrogenic fistulas following obstetric surgery (Group B1), and 37 were iatrogenic fistulas following gynecological surgery (Group B2). All were vesicovaginal fistulas: mid-vaginal (43%) in Group A, juxtacervical (56%) in Group B1, and vault (100%) in Group B2. Most fistulas were small (<2 cm) and single. Successful closure ("closed and dry") was achieved in 70.2%, 62.5%, and 89.2% of Groups A, B1, and B2, respectively. Significant differences were observed between Groups A and B2 ($p = 0.035$). Multivariable analysis identified etiology, location, size, and circumferential defect as predictors of success. Gynecologic iatrogenic fistulas had higher odds of successful repair (AOR 3.28, 95% CI 1.12–9.63, $p = 0.030$).

Conclusion: Surgical outcomes for obstetric and obstetric-surgery-related fistulas were comparable, while gynecologic-surgery-related fistulas demonstrated significantly better success rates, emphasizing the importance of individualized surgical planning to optimize repair outcomes.

Keywords: Obstetrics Fistula; Surgical Outcome; Urogenital Fistula; Iatrogenic Fistula.

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Received Date : 02 April, 2025

Accepted Date : 20 April, 2025

Introduction

Genital tract fistula is a significant global health issue affecting millions of young women, primarily in impoverished regions of Africa and South Asia.[1] A fistula is an abnormal passageway between two epithelial surfaces, often resulting in debilitating conditions. Genitourinary fistulas, specifically, are abnormal connections between the urinary and genital tracts, leading to involuntary leakage of urine into the vagina.[2] These fistulas can be acquired or, rarely, congenital. The main causes are obstetric complications and iatrogenic injuries, with other factors including trauma, sexual assault, congenital anomalies, and cancer. The most prevalent types are vesicovaginal and rectovaginal fistulas, which cause chronic health issues, depression, social isolation, and poverty.[2]

Estimates suggest that at least two million women live with fistulas, primarily in sub-Saharan Africa and South

Asia, with 50,000-100,000 new cases annually.[3] In contrast, Western countries report fewer cases due to better healthcare facilities and referral systems. In Bangladesh, the prevalence of obstetric fistula was 1.69 per 1000 women in 2003 and 0.42 per 1000 women in 2016, with approximately 19,755 women affected.[4] Despite efforts, the treatment rate remains low, with only about 300 surgeries performed annually.[5] Given the present global context, the United Nations General Assembly has called for increased efforts and established a target to eradicate obstetric fistula by 2030.[6]

The COVID-19 pandemic threatens progress, potentially increasing child marriages and home deliveries, thereby raising the risk of obstetric fistulas.[7,8] Surgical intervention remains the primary treatment, with success rates between 75% and 95%.[9,10] While numerous studies focus on obstetric fistulas, there is a notable lack of studies on the outcomes of Urogenital fistula (UGF). Most studies deal with factors associated with obstetric fistula because of their predominance[11]. This study aims to fill that gap by comparing outcomes of obstetric fistula and iatrogenic fistula at the National Fistula Centre of Dhaka Medical College Hospital.

Materials and Methods

A retrospective observational study was conducted on hospital records of patients who underwent surgical repair for urogenital fistulas (UGFs) at the National Fistula Centre, Dhaka Medical College Hospital, from January 1, 2017, to December 31, 2019. After obtaining approval from the Ethical Review Committee and permission from the hospital authority and the Head of the Department of Obstetrics and Gynecology, data from various sources including patient admission files, hospital record sheets (initiated in December 2012 by DGHs with technical support from OGSB and UNFPA), doctors' records, nurses' discharge records, and operation notes were collected while maintaining patient confidentiality.

Patients aged 15-65 years with documented vesico-vaginal fistula (VVF) were included, while those with rectovaginal fistula, complete perineal tear, comorbidities like diabetes mellitus or chronic obstructive pulmonary disease (COPD), and incomplete records were excluded. Data were collected from hospital records, including patient admission files, surgical notes, and discharge summaries, and recorded on individual data sheets while maintaining confidentiality.

Independent variables included BMI, etiology, and duration of fistula, obstetric variables (parity, duration of labour, Ante Natal Care (ANC) schedule), fistula characteristics (size, number, location, scarring, associated problems), previous repair attempts, operative variables (operation time, closure method, suturing method, ureteric catheter), and postoperative complications. The dependent variable was the surgical outcome of fistula classified as closed and dry, closed but incontinent, or failed.

The study classified UGFs into two main groups: Obstetric Fistula (OF) and Iatrogenic Fistula (IF). Group A comprised OF, which resulted from vaginal delivery after prolonged obstructed labour without appropriate obstetric interventions or cesarean section. Group B was divided into two subgroups: Group B1 included IFs occurring after cesarean sections (both elective and emergency) or cesarean hysterectomy, and Group B2 included IFs resulting from gynecologic surgeries such as total abdominal hysterectomy, vaginal hysterectomy, or dilation and curettage (D&C). UGFs resulting from other causes (congenital, malignancy, irradiation) were excluded from this study.

Data collected included socio-demographic characteristics, obstetric and previous surgical histories, fistula characteristics, intraoperative procedures, postoperative management, complications, and surgical outcomes after 21 days. All surgeries were performed at least 3 months after the injury under spinal anesthesia via the vaginal route, utilizing the flap-splitting method for repair. The technique involved wide mobilization of the vaginal mucosa around the fistula, closing the bladder in two layers: the first with interrupted Lembert sutures for the submucosal layer, and the second layer for the muscularis to minimize tension on the initial suture line.

Standard protocols for fistula repair were followed, including adequate exposure and mobilization of the bladder, excision of scar tissue, and protection of the ureters. Postoperative care included bladder catheterization for 21 days and a ureteric catheter for 3 to 7 days. Patients were instructed to drink plenty of water and void frequently. They were discharged 24 hours after catheter removal. Success was defined by the absence of leakage and the ability to hold urine, while failure was indicated by ongoing leakage. Outcomes were categorized as 'Closed and Dry' (successful closure with no incontinence), 'Closed but Incontinent' (successful closure but with stress urinary incontinence), or 'Failed' (failure to close the fistula with leakage post-catheter

removal). Postoperative urinary tract infections were identified by pus cells >5/HPF in urine and the presence of organisms in urine culture.

Data on socio-demographic, clinical, surgical, and outcome variables were recorded, entered, managed, and analyzed. Data were analyzed using SPSS, version 25. Categorical variables were summarized as frequencies and percentages, while continuous variables were presented as mean ± standard deviation (SD). Group comparisons were performed using the Chi-square test, Fisher's exact test, t-test, Mann–Whitney U test, and Kruskal–Wallis test, depending on data type and distribution. Variables with $p < 0.1$ in bivariate analysis were included in a multivariable logistic regression model to identify independent predictors of fistula closure success. Results were expressed as adjusted odds ratios (AOR) with 95% confidence intervals (CI), and a p value < 0.05 was considered statistically significant.

Result

Table 1 presents the distribution of patients based on the etiology of fistula among 100 cases. In Group A, all patients (100%) developed fistula due to prolonged obstructed labour, indicating it as the sole cause in this group. In Group B1, the majority of cases (87.5%) were associated with caesarean section, while peri-partum hysterectomy accounted for 12.5%. In Group B2, most fistula cases (97.3%) occurred following total abdominal hysterectomy (TAH), with only 2.7% resulting from vaginal hysterectomy (VH). These findings highlight surgical procedures, particularly caesarean section and TAH, as major contributors in the respective subgroups.

Table-1: Distribution of the patients according to etiology of fistula (n=100)

Etiology of fistula	No. of patients n (%)
Group A	
Prolonged obstructed labour	47 (100)
Group B1	
Caesarean section	14 (87.5)
Peri-partum hysterectomy	2 (12.5)
Group B2	
Total Abdominal Hysterectomy (TAH)	36 (97.5)
Vaginal Hysterectomy (VH)	1 (2.7)

Table 2 shows the distribution of patients according to BMI and duration of fistula. The mean BMI was 25.28 ± 8.19 kg/m^2 in Group A, 28.09 ± 12.79 kg/m^2 in Group B1, and 24.52 ± 7.18 kg/m^2 in Group B2, with no statistically significant difference among the groups ($p = 0.467$). The majority of patients in all groups had normal BMI. However, the duration of fistula differed significantly between groups ($p = 0.021$). The mean duration was longest in Group A (62.1 ± 78.5 months), followed by Group B1 (47.2 ± 64.9 months) and Group B2 (9.3 ± 9.0 months). The difference in duration was also significant when analyzed by categorical grouping ($p = 0.015$), indicating that patients with obstetric fistula suffered for longer periods before receiving surgical treatment.

Table-2: Distribution of the patients according to BMI

Variables	Group A n=47 n (%)	Group B1 n=16 n (%)	Group B2 n=37 n (%)	P-value
BMI (kg/m2)				
Under weight	7 (14.9)	1 (6.3)	7 (18.9)	
Normal	22 (46.8)	7 (43.8)	16 (43.2)	0.741*
Over weight	8 (17.0)	5 (31.3)	4 (10.8)	
Obese	10 (21.3)	3 (18.8)	10 (27.0)	
Mean ± SD	25.28 ± 8.19	28.09 ± 12.79	24.52 ± 7.18	0.467**
Duration of Fistula				
<6 months	17 (36.2)	2 (12.5)	17 (45.9)	
6-12 months	6 (12.8)	6 (37.5)	17 (45.9)	
12-36 months	7 (14.9)	3 (18.8)	2 (5.4)	0.015*
>36 months	17 (36.2)	5 (31.3)	1 (2.7)	
Mean ± SD	62.10 ± 78.54	47.19 ± 64.88	9.32 ± 9.01	0.021**

*Chi-square test, **Kruskal-Wallis test was done.

Table 3 summarizes the characteristics of the fistula in the three groups. Most of the patients had a single fistula (91.5–97.3%) and a small size (<2 cm). Small-sized fistulas were more common in Group B2 (89.2%) compared with Group B1 (56.3%) (p = 0.043). The anatomical location of the fistula varied significantly according to etiology. In Group A, mid-vaginal fistulas were most frequent (42.6%), while juxta-cervical fistulas predominated in Group B1 (62.5%), and vault fistulas were present in all cases of Group B2 (100%) (p < 0.05). Mild scarring was the most common in all groups, but moderate to severe scarring was more prevalent in Group B1 (50%). Circumferential defects were observed in 29.8% of Group A cases and were absent in all iatrogenic groups. Associated problems such as vaginal stenosis, bony attachment, and excessive urine loss were infrequent and found mainly in obstetric cases.

Table-3: Distribution of the patients according to Fistula Variable

Variable	Group A n=47 n (%)	Group B1 n=16 n (%)	Group B2 n=37 n (%)	P-value (AvsB1)	P-value (AvsB2)
Number of Fistula					
1	43 (91.5)	15 (93.8)	36 (97.3)	0.99*	0.37*
2	2 (4.3)	1 (6.3)	1 (2.7)	0.99*	0.99*
3	2 (4.3)	-	-		-
Size of Fistula					
Small	39 (83)	9 (56.3)	33 (89.2)	.043*	0.42**
Medium	6 (12.8)	5 (31.3)	3 (8.1)	0.13*	0.73*
Large	2 (4.3)	2 (12.5)	1 (2.7)	0.27*	0.99*
Location of Fistula					
Vault	-	2 (12.5)	37 (100)		-
Juxta-cervical	11 (23.4)	10 (62.5)	-	0.01**	-
Mid vagina	20 (42.6)	2 (12.5)	-	0.03**	-
Juxtra-urethral	6 (12.8)	-	-		-
Bladder neck	10 (21.3)	2 (12.5)	-	0.71*	-
Scarring					
None	10 (21.3)	2 (12.5)	15 (40.5)		
Mild	27 (57.4)	5 (31.3)	17 (45.9)	0.34**	0.41**
Moderate	9 (19.1)	8 (50)	5 (13.5)		
Severe	1 (2.1)	1 (6.3)	-		
Circumferential defect-					
Present	14 (29.8)	-	-		
Absent	33 (70.2)	16 (100)	37 (100)		
Associated problem					
Vaginal stenosis	3 (6.3)	-	-		
Bony attachment	4 (8.5)	3 (18)	-		
Excessive loss of urine	5 (10)	2 (12.5)	-		

**Chi-square test was done to measure the level of significance.
*Fisher's Exact test was done to measure the level of significance.

Table 4 presents the operation-related variables among the three groups. More than half of the patients in Group A (54.4%) and the majority in Group B2 (83.8%) had no previous repair attempts, which was statistically significant (p = 0.010). The mean total operation time was similar across the groups (61.5 ± 22.3 min in Group A, 67.5 ± 31.9 min in Group B1, and 64.1 ± 12.6 min in Group B2; p > 0.05). Single-layer closure was the preferred method in all groups, ranging from 68.8% to 83%, and interrupted suturing was the most common technique, particularly in Group B2 (100%), which was statistically significant (p = 0.032). Ureteric catheterization was performed less frequently in Group B2 (8.1%) compared with Group A (27.7%) (p = 0.034).

Table-4: Distribution of patients according to operation-related variables

Variable No. of previous attempt of repair	Group A n=47 n (%)	Group B1 n=16 n (%)	Group B2 n=37 n (%)	P-value A vs B1	P-value AvsB2
No attempt	27 (54.4)	11 (68.6)	31 (83.8)	0.425**	0.010**
One attempt	19 (40.4)	4 (25)	3 (8.1)	0.268**	0.010**
Two attempts	1 (2.1)	1 (6.3)	3 (8.1)	0.446*	0.316*
Total Operation Time (minute)					
Mean ± SD	61.49 ±22.26	67.50 ±31.94	64.05 ± 12.57	0.605***	0.451***
Min-Max	30-120	30-180	60-120		
Method of closer					
Single layer	39 (83)	11 (68.8)	28 (75.7)	0.286*	0.408**
Double layer	8 (17)	5 (31.3)	9 (24.3)		
Method of suturing					
Continuous	6 (12.8)	2 (12.5)	-	0.99*	0.032*
Interrupted	41 (87.2)	14 (87.5)	37 (100)		
Ureteric catheter					
Catheterized	13 (27.7)	2 (12.5)	3 (8.1)		0.034*
Non-catheterized	34 (72.3)	14 (87.5)	34 (91.9)	0.150*	

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

*Fisher's Exact test was done to measure the level of significance.

*** An independent samples t-test was done to measure the level of significance.

Table 5 describes postoperative complications and surgical outcomes. Postoperative urinary tract infection (UTI) occurred in 9.4% of iatrogenic cases (Group B1 + B2) compared to 2.1% in obstetric cases (p = 0.052). Wound infection was rare, observed only in 5.4% of Group B2 patients. Overall, 70.2% of obstetric fistula repairs (Group A) resulted in successful closure with continence ("closed and dry"), 6.4% were "closed but incontinent," and 23.4% failed. In Group B1, 62.5% were "closed and dry," 6.3% "closed but incontinent," and 31.3% failed. In contrast, Group B2 showed a significantly higher success rate, with 89.2% "closed and dry," 2.7% "closed but incontinent," and 8.1% failed. The difference between Group A and Group B2 was statistically significant (p = 0.035), whereas no significant difference was observed between Group A and Group B1 (p = 0.567).

Table-5: Distribution of the patients according to post-operative outcome

Variables	Group A (n=47)	Group B1 (n=16)	Group B2 (n=37)	Group B1+B2 (n=53)	P-value (A vs B1)	P-value (A vs B2)	P-value (A vs B1+B2)
Post-operative complication							
UTI	1 (2.1)	0 (0)	5 (13.5)	5 (9.4)	0.99*	0.048*	0.052*
Wound infection	0	0	2 (5.4)	2 (3.8)	-	0.99*	0.99*
Surgery outcome							
Closed and dry	33 (70.2)	10 (62.5)	33 (89.2)	43 (81.1)	0.567**	0.035**	0.202**
Closed but incontinent	3 (6.4)	1 (6.3)	1 (2.7)	2 (3.8)	0.99*	0.627*	0.664*
Failed	11 (23.4)	5 (31.3)	3 (8.1)	8 (15.1)	0.525**	0.062**	0.290**

* Fisher's exact test applied for rare events or small expected counts (<5).

**Chi-square test applied when all expected cell counts ≥5.

Table 6 presents the multivariable logistic regression analysis of factors associated with successful fistula closure. Compared with obstetric fistula (Group A), gynecologic iatrogenic fistula (Group B2) was significantly more likely to achieve successful closure (AOR 3.28, 95% CI 1.12–9.63, p = 0.030). Fistula location and size were also significant predictors of outcome. High-location fistulas (vault or juxta-cervical) were more likely to close successfully than mid or low vaginal fistulas (AOR 3.15, 95% CI 1.21–8.19, p = 0.019), while medium or large fistulas were associated with poorer outcomes compared with small ones (AOR 2.41, 95% CI 1.03–5.65, p = 0.043). The presence of circumferential defects was another negative predictor (AOR 2.97, 95% CI 1.01–8.69, p = 0.048).

Table-6: Multivariable logistic regression analysis of factors associated with successful closure of vesico-vaginal fistula in patients undergoing repair (Group B1/B2 vs Group A)

Predictor Variable	**Category Compared to Ref.**	**Adjusted OR**	**95% CI**	**P-value**
Group B1	B1 vs A	0.68	0.20 – 2.32	0.531
Group B2	B2 vs A	3.28	1.12 – 9.63	0.030
Group B1+B2	B1+B2 vs A	1.92	0.75 – 4.91	0.172
Fistula size	Medium/Large vs Small	2.41	1.03 – 5.65	0.043
Fistula location	High (vault/juxta-cervical) vs Mid/Lower	3.15	1.21 – 8.19	0.019
Scarring	Moderate/Severe vs None/Mild	1.88	0.82 – 4.31	0.135
Circumferential defect	Present vs Absent	2.97	1.01 – 8.69	0.048

Table 7 shows the comparison between successful and failed repairs among all cases. The overall success rate was 76%. Patients with successful closure had lower BMI (24.1 ± 7.2 kg/m^2) than those with failed repairs (30.3 ± 12.4 kg/m^2), though the difference was marginally significant (p = 0.050). Scarring and previous repair attempts were significantly associated with outcome. Mild or no scarring was observed in 84% of successful cases, whereas moderate to severe scarring predominated among failed repairs (p = 0.045). Similarly, success was higher in primary repairs (86.6%) compared with cases with one or more previous attempts (p = 0.035). Other variables such as age, duration of fistula, fistula size, and number showed no significant association with surgical outcome.

Table-7: Distribution of the patients according to success and failure in all groups

Surgery Outcome	Success (n=76)	Failure (n=19)	P-value
Age (year)			
Mean ± SD	37.26 ± 11.67	35.84 ± 13.44	0.646***
BMI (kg/m2)			
Mean ±SD	24.13 ± 7.16	30.31 ± 12.43	0.050***
Duration of fistula			
Mean ±SD	238.49 ± 63.91	41.25 ± 64.95	0.668*
Median	9	11	
Location of fistula			
Vault	31 (93.9)	2 (6.1)	
Juxta-cervical	16 (69.6)	7 (30.4)	
Mid-vagina	18 (81.8)	4 (18.2)	0.566**
Juxta-urethra	4 (66.7)	2 (33.3)	
Bladder neck	7 (63.6)	4 (36.4)	
Size of fistula			
Mean ± SD	1.18 ± 0.48	1.37 ± 0.68	0.280***
Number of fistulas			
Mean ± SD	1.08 ± 0.36	1.11 ± 0.32	0.769***
Scarring			
None	21 (93.8)	1 (6.3)	
Mild	40 (83.3)	9 (16.7)	0.045**
Moderate	13 (60.9)	9 (39.1)	
Severe	-	2 (100)	
No. of previous attempt of repair			
No attempt	58 (86.6)	9 (13.4)	
One attempt	16 (66.7)	8 (33.3)	0.035**
Two attempts	2 (50)	2 (50)	

*The Mann-Whitney U test was done to measure the level of significance.

*** An independent samples t-test was done to measure the level of significance.

Discussion

Prolonged obstructed labour was historically the principal cause of urogenital fistula in both developed and developing countries. Over time, this pattern has shifted, and iatrogenic fistulas caused by surgical procedures are increasingly recognized. The present study observed a nearly equal distribution of obstetric (47%) and iatrogenic (53%) fistulas, reflecting this global trend. A similar study in Pakistan reported iatrogenic and obstetric fistulas in 58.5% and 40.5% of cases, respectively, with the proportion of iatrogenic cases increasing from 43.5% in 2006 to 71.4% in 2018.[12]

In this study, Group A represented obstetric fistulas (47 cases) and Group B represented iatrogenic fistulas (53 cases), further divided into Group B1 (childbirth-related surgery, 16 cases) and Group B2 (gynecological surgery, 37 cases). Multiparity was frequent in all groups, observed in 48.9% of Group A, 81% of Group B1, and 83% of Group B2. Previous research also demonstrated similar trends, suggesting that multiparous women face a greater risk due to repeated childbirth trauma and cumulative pelvic injury.[13]

Prolonged labour was a major etiologic factor in obstetric cases. In this study, 36% of patients laboured

for two days and 14.9% for three or more days. Previous study reported a comparable relationship between prolonged labour and complex fistula formation.[14] Prolonged compression leads to ischemic necrosis of the vesicovaginal septum, resulting in more extensive tissue loss and complex repair.

Regular antenatal care (ANC) was limited in this cohort-14% of Group A and 25% of Group B1 had regular ANC visits. Similar research reported that inadequate prenatal monitoring delays referral and increases injury severity. The mean duration of suffering was longer in Group A and Group B1 compared with Group B2 (p = 0.015). A study in Nepal reported that 25% of obstetric fistula patients endured symptoms for 3–6 months before seeking treatment, whereas 48% of gynecological fistula patients sought care within 2 weeks, which corresponds with the present findings.[13]

To maintain sample uniformity, vesicovaginal fistula (VVF) was analyzed exclusively. The present study observed predominantly single, small (<2 cm) fistulas. The anatomical distribution varied with etiology: 42.6% were mid-vaginal in Group A, 56.3% juxtacervical in Group B1, and 100% vault-level in Group B2. These results are similar to those reported by Sjoveian and team (2010), who identified VVF as the most common type of urogenital fistula[1], and by another study, where mid-vaginal involvement was in 56% of cases[15]. The anatomical explanation lies in the flat bladder base extending from the symphysis pubis to the fourth sacral vertebra, where prolonged pressure during labor causes ischemic necrosis and mid-vaginal fistula formation. A study from Nigeria also showed predominant mid-vaginal fistulas.[16]

In the present study, the outcome of primary repair was more favorable. In Group A, 70.2% of patients achieved closed and dry repair, 6.4% were closed but incontinent, and 23.4% failed; in Group B1, 62.5% were closed and dry, 6.3% closed but incontinent, and 31.3% failed. These success rates are comparable with those reported by similar previous studies.[11,13] The comparable outcomes between obstetric and iatrogenic cases may reflect similar levels of tissue damage due to ischemia or surgical trauma.

Factors such as age, BMI, fistula duration, size, location, and number were not significantly associated with outcome in this study. However, extensive scarring and prior repair attempts were associated with lower success rates. A similar study in Kenya demonstrated that fibrosis and previous operations markedly reduce healing potential and closure rates.[17] In the present study, despite small fistula size not showing statistical significance, many failures occurred among small, high-positioned or stenotic fistulas with prior repairs, suggesting poor surrounding tissue quality.

In this analysis, Group B2 (gynecological surgery) achieved an 89.2% success rate, compared with 70.2% in Group A. Postoperative urinary tract infection occurred in 10% of Group B2 patients versus 2% in Group A. few recent studies also reported similar associations between prior surgeries, extensive fibrosis, and lower repair success.[11,18] A previous Bangladeshi study showed that previous repair attempts significantly affected closure rates in both univariate and multivariate analyses.[19]

The duration of fistula also influenced outcome. In this study, patients with symptoms lasting less than six months had markedly better results than those with longer durations. Another study reported similar findings in India, with multivariate analysis identifying etiology (OR 2.2), fistula location (OR 2.5), and previous repair (OR 2.4) as significant predictors, while urinary infection showed significance in univariate analysis. Similarly, another study also found an overall success rate of 87.1% in 567 women, with no association between age or parity and outcome.[1]

Persistent incontinence after closure occurred in a small proportion of patients across all groups. This may result from residual urodynamic dysfunction following prolonged obstruction. Other study also emphasized that urodynamic evaluation and corrective procedures can address such incontinence.[20] Lo No and team (2018) also found that stress incontinence and detrusor overactivity can persist after repair.[21] Previous study also suggested that labial fat graft interposition as an adjunct to improve bladder neck support and reduce postoperative stress incontinence.[19]

In multivariable logistic regression, etiology, anatomical location, size, and circumferential involvement were significant predictors of success. Gynecologic iatrogenic fistulas (Group B2) had 3.28 times higher odds of successful closure compared with obstetric fistulas (AOR 3.28, 95% CI 1.12–9.63, p = 0.030). High-level fistulas (vault or juxtacervical) had 3.15 times higher odds of closure success than mid- or low-level fistulas (AOR 3.15, 95% CI 1.21–8.19, p = 0.019). Similar studies have demonstrated better outcomes for fistulas located at

higher levels with minimal fibrosis.[22,23] In contrast, larger fistulas and those with circumferential defects showed significantly reduced odds of closure ($p<0.05$), consistent with evidence that extensive defects impair healing.[24,25]

This study had limitations due to its retrospective design during the COVID-19 pandemic, which restricted access to detailed surgical indications and newer classification data. Long-term follow-up information on recurrence and continence was also incomplete. Future research should employ prospective, multicenter designs with larger sample sizes, standardized classification systems, and improved database management to enhance the validity and reproducibility of findings.

Conclusion

The study emphasizes the shifting etiology from obstetric to iatrogenic fistulas, with surgical outcomes being generally favorable for gynecological fistulas compared to obstetric ones. Regular ANC, timely referrals, and addressing factors like scarring and previous repair attempts are critical for improving surgical outcomes. The findings are consistent with global research, indicating that while the etiological trends are changing, the challenges in management and repair remain complex and multifaceted.

Acknowledgement

We extend our heartfelt gratitude to all the healthcare professionals, institutions, and participants who contributed to this study. We also appreciate the invaluable feedback from our peer reviewers, which greatly enhanced the quality of this research. Lastly, we are deeply grateful to the women affected by obstetric fistula who shared their experiences, significantly informing our work.

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Case Report

A Middle Aged Male with Granulomatous Orchitis: Primary Diffuse Large B-Cell Lymphoma of Testis Mimicking Tubercular Orchitis

Richmond Ronald Gomes[1]

Abstract

Primary testicular lymphoma is a rarely seen testicular tumor accounting for 1-9% of all testicular tumors. It is a rare form of extra nodal non-Hodgkin's lymphoma representing 1% - 2% of non-Hodgkin's lymphoma. The dominant histological subtype is diffuse large B-cell lymphoma (DLBCL). It is the most common testicular malignancy in men aged over 60 years. Patients with primary testicular DLBCL show a continuously high risk of recurrence with no plateau in the survival curves and a tendency to involve other extra nodal sites, especially the central nervous system and the contralateral testis. Here we present a 60-year-old gentleman from Bangladesh presenting with fever and unilateral testicular mass for 3 months. Fine needle aspiration cytology (FNAC) from testicular mass revealed granulomatous orchitis and he was started anti tubercular medication without improvement. Later orchiectomy was done and Immunohistochemistry showed diffuse large B-cell lymphoma. He was referred to oncology for further management.

Keywords: Primary Testicular Lymphoma; Diffuse Large B-Cell Lymphoma; FNAC; Granulomatous Orchitis; Immunohistochemistry.

Introduction

Primary testicular lymphoma (PTL) was first reported by Curling in 1866.[1] It is a group of uncommon neoplasms, with the subtypes of diffuse large B-cell lymphoma (DLBCL), follicular lymphoma and Burkitt's lymphoma.[2,3] In general, primary testicular DLBCL, the frequent subtype (80%-98%) among all, arises in old age (i.e., >60 years).[4,5,6] The typical clinical signs of testicular DLBCL include testicular swelling, B-symptoms and elevated lactate dehydrogenase (LDH) levels[7]. Bilateral instances account for around. 20% of all cases. In general, testicular DLBCL tumors are classified based on Cotswold modification of Ann Arbor staging system, where crucial disease parameters like tumor size, lymphadenopathy and regions of lymph node involvement are considered towards the assessment of overall clinical stage of the disease.[8] Primary testicular DLBCL has been reported to exhibit aggressive clinical behavior, poor prognosis and high tendency to disseminate to the central nervous system (CNS) and thereby related to high morbidity and mortality rates.[4,9] The hybrid 2-[fluorine-18] fluoro-2-deoxy-d-glucose (FDG) positron emission tomography/computed tomography (PET/CT) has become the standard imaging tool for initial staging and assessment of the treatment response in lymphoma patients.[10,11,12,13] There is no standard treatment modality for primary testicular lymphomas due to their rare occurrence, however, today, systemic chemotherapy(R-CHOP) and radiotherapy (25 Gy), prophylactic intrathecal chemotherapy are performed after orchiectomy. When considering all stages, 5-year survival rate is 12% for these tumors showing frequent relapses.[14]

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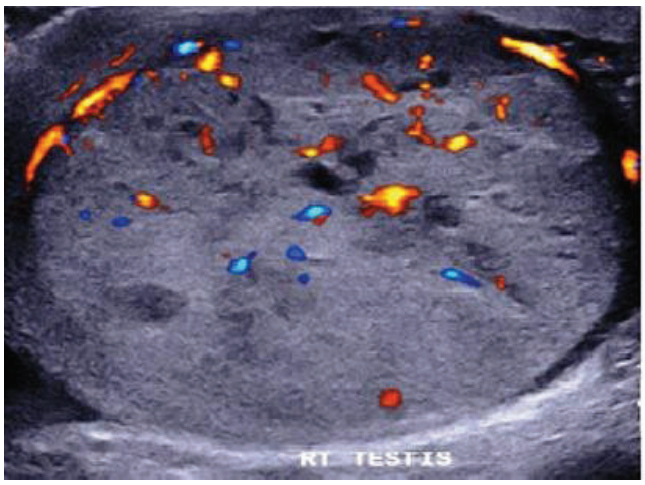
Received Date : 15 May, 2025

Accepted Date : 03 June, 2025

Case report

A 60 years old Bangladeshi gentleman presented to Urology department with symptoms of a lumpy and heavy right testicle without any tenderness. Both testes were initially the same size, however the patient noticed an increase in the size of this right testicle during the previous three months. The patient is a school teacher who had history of prolonged sitting, where the patient felt that the discomfort is getting worse while on the job. The patient denied previous complaints of testicular enlargement in himself and his parents, as well as history



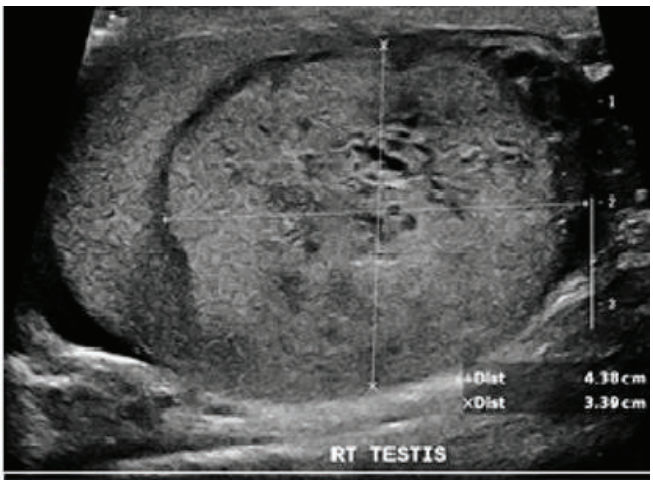


Figure 1 and Figure 2: Color Doppler ultrasonography of right Testis showed hypoechoic mass in the right testis with internal vascularization.

of undescended testicles, and previous surgery. Complaints related to malignancy include low back pain, cough and shortness of breath, decreased appetite (anorexia), nausea and vomiting, bone pain, weight loss, and weakness (malaise) which the patient denied. He also gave history of low-grade, intermittent fever, highest being recorded as 101°F with night sweat. On query, he stated that he had lost about 6 kg of his previous weight unintentionally. He had strong family history of tuberculosis. On physical examination, he was mildly anemic. No lymphadenopathy was present. On urological examination, a mass measuring 2 cm in diameter was palpable in his right testis, and the contralateral testis and other structures were found to be normal. Before being referred to our clinic, he was treated with various antibiotics, considering it to be chronic orchitis. The values were calculated as Hgb: 9.1 g/dL, Hct: 28.2%, WBC: 6.81 mm^3. There were no other abnormalities in the laboratory tests such as liver function tests, renal function tests, urine analysis, coagulation parameters, Mantoux test and tumor markers such as alpha-fetoprotein, beta-hCG. Also, serum antibodies against HIV were negative. Chest X-ray and abdominal ultrasound failed to reveal any mediastinal or intrabdominal lymphadenopathy respectively. Doppler ultrasonography of testis showed a hypoechoic mass, measuring about 21×17 mm in the right testis with internal vascularization. (Figure 1 and 2) There is also another hypoechoic mass, measuring about 24× 14 mm with internal vascularization in the tail region of right epididymis. Left testis and epididymis were normal.

FNAC from right testicular mass and histopathology was done, which showed effacement of testicular tissue with infiltration of small lymphocyte and histiocyte with scattered epithelioid cells suggestive of chronic granulomatous orchitis. (Figure 3).

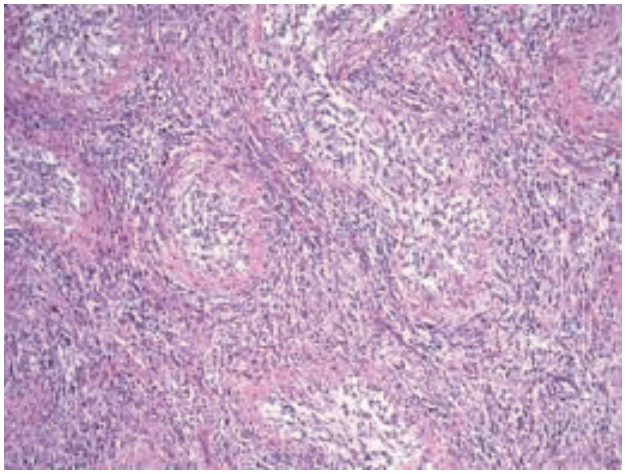


Figure 3: Testicular tissue showing scattered granuloma suggestive of chronic granulomatous orchitis

On the basis of history, positive family history and histopathology report, the patient was started anti tubercular chemotherapy according to weight and advised to follow up after 1 month. 2 weeks after starting treatment he again presented with high fever. Reevaluation revealed new development of right inguinal, firm, non-tender mobile lymphadenopathy. LDH was high (970U/L, normal below 250 U/L). Right radical inguinal orchiectomy was done. Immunohistochemical staining revealed positivity for

LCA, Ki 67(nuclear proliferation marker-80% positive), MUM1(Multiple myeloma oncogene), BCL 6(nuclear marker for germinal center B lymphocyte) & Pan B (CD20) and negativity for S-100, SMA, CD3(membrane marker for B lymphocyte), CD10. According to the World Health organization diagnosis criteria and using Hans algorithm, the diagnosis was DLBCL of testis with non-germinal center phenotype (Figure 4).

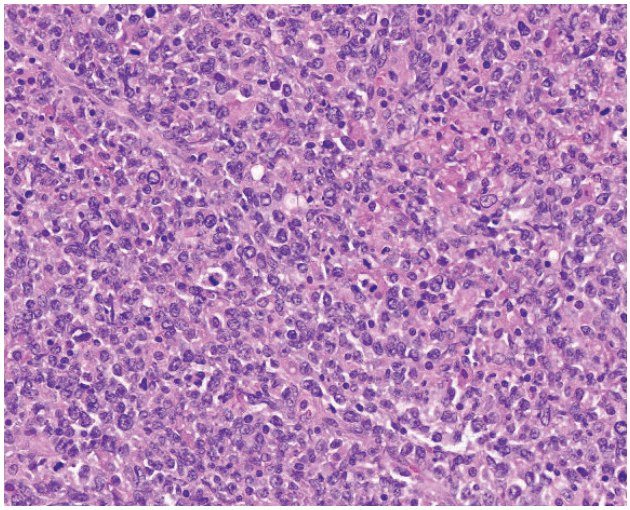


Figure 4: Immunohistochemistry of testicular tissue showing features of DLBCL, non-germinal center type.

According to the internal prognostic index (IPI), patients' IPI score was evaluated as 5 and according to Ann Arbor staging, patients' stage was interpreted as grade 3E. The patient was referred to the medical oncology and radiation department after the orchiectomy with the purpose of adjuvant chemotherapy and radiotherapy.

Discussion

PTL is a rare pathology that represents 1% - 2% of all malignant non-Hodgkin's lymphomas, 4% of all extra nodal malignant non-Hodgkin's lymphomas and 5%- 9% of malignant testicular tumors.[15,16,17] Age at diagnosis vary between 60 and 70 years.[18] Most cases are classified as a non-germinal center cell-of-origin subtype, which may partially account for the aggressive nature of the disease.[19]

The etiological and predisposing factors of the PTLs are not well understood. However, no relation between lymphoma and trauma, chronic orchitis, filariasis of spermatic cord or undescended testis was found.[20] Although specific risk factors for PTL are limited, HIV infection has been identified as a factor for aggressive NHL.[21] In HIV-infected patients, lymphoma occurs more extensively in extra nodal sites such as testis. Classification of primary testicular lymphoma that was modified by the Nordic Lymphoma Group is as follows: stage I: unilateral testis involvement with or without epididymis or cord involvement; stage II: abdominal and pelvic lymph node involvement; and stage II-IV: distant metastasis.

The usual symptomatology is a progressive increase in testicular volume over several months without pain [15,16]. It may be accompanied by fever, weight loss, or night sweats.[22] The presence of these systemic signs is predictive of tumor aggressiveness and is observed in 25% to 41% of patients with advanced disease.[16,23] Granulomatous orchitis, pseudolymphoma, plasmacytoma, and rhabdomyosarcoma are other conditions mimicking testicular lymphoma. The symptomatology was similar in our patient but general signs were absent.

The most important factors identifying prognosis are the clinical stage and histological grade.[24] It has been reported that a primary tumor larger than 9 cm, epididymis, presence of spermatic cord and bilateral testis involvement, vascular invasion, advanced age, high LDH levels, presence of B symptoms, high International Prognostic Index (IPI) score, and left testis involvement are factors associated with poor prognosis.[25] Nevertheless, young age, localized tumor, presence of sclerosis, small size of the tumor, low histologic grade and no epididymis or spermatic cord involvement are indicators of good prognosis.[26]

The classic physical sign in the localized stage is a solid testicular mass of variable size. This mass can be unilateral or bilateral. Bilateral localization is the most frequent according to the literature. It is synchronous in 10% and asynchronous in 30% - 35%. Our patient had a unilateral lesion.

Scrotal ultrasonography is the first-line examination for an enlarged scrotum.[16,27] It is often coupled with Doppler. It allows the mass to be highlighted with its measurements. In ultrasonographic examination, hypoplasia, diffuse enlargement, and increased echogenicity of the testis and loss of hypervascularity, or a striped pattern of the entire testis might be observed in neoplastic infiltrative diseases such as plasmacytoma, leukemia and lymphoma.[27] However, these features can be observed in inflammatory diseases such as chronic granulomatous orchitis and other inflammatory processes as well. Thus, in the absence of clinical signs and symptoms of inflammation, correct interpretation of

the findings might be challenging. Lactate dehydrogenase (LDH) levels are elevated, while BHCG and AFP are rarely elevated.[28] BHCG and AFP markers were normal in our patient.

Orchidectomy is essential because it is of diagnostic and therapeutic interest.[17,22,29,30] It is performed through an inguinal approach. It removes the so-called sanctuary site.[15,17] In the presence of the blood-testicular barrier, the drugs penetrate the testicles with difficulty and the effect of chemotherapy is not ideal [31]. At the same time, testicular tumor cells may also express high levels of drug-resistant proteins, such as P-glycoprotein (PGP) and breast cancer drug-resistant protein (BCRP), resulting in resistance to chemotherapy.[32]

The most common histologic subtype is diffuse large B-cell lymphoma, accounting for approximately 80 - 90% of testicular lymphomas.[17,22,29,33] On immunochemistry, tumor cells usually express pan-B-cell markers such as CD19, CD20, CD22, CD79a and PAX5. Surface and cytoplasmic immunoglobulins (Ig), most commonly IgM, are demonstrated in the majority of cases, and the Ki-67 proliferation index is high.[33]

Lumbar puncture for tumor cells in the CSF is recommended because the central nervous system is a preferred metastatic site.[34] Brain MRI is recommended in some studies.[22,35] Other metastatic sites include skin, lung, contralateral testis, Waldeyer's ring.[17,22]

For a long time, bone marrow biopsy and thoracic-abdominal-pelvic CT scans were used to differentiate between localized and metastatic disease.[5] Whole body 18-fluorodeoxyglucose positron emission tomography-computed tomography (18-FDG- PET-CT) has a prominent place in the initial workup of lymphoma. It is more sensitive for the detection of other extra-ganglionic lesions.[35,36]

The Ann-Arbor classification is the staging system for primary testicular lymphomas. The vast majority (70% - 80%) are diagnosed at a localized stage (stage I - II).[16,37,38] Advanced stages (stage III - IV) are very rare.[33,34]

Due to the low incidence of the disease, no randomized phase III trials have been conducted and the therapeutic approach is based on data from phase II trials and retrospective studies.[36] A multimodal therapeutic approach is needed. The multidisciplinary team includes urologists, hematologists and radiation oncologists.[39] Orchiectomy is the preferred treatment since it removes the malignant tumor while also providing a biopsy sample for further histopathological examination. Chemotherapy before surgery is not optimal due to the presence of a blood-testicular barrier, which makes it difficult for the medicine to reach the testes, at the same time testicular tumor cells express drug-resistant proteins R-CHOP chemotherapy followed by central nervous system chemoprophylaxis and scrotal radiotherapy is the standard treatment for localized stage I–II PTL.[17,23,40] The addition of CNS prophylaxis with IV administered CNS-penetrating chemotherapy such as high dose methotrexate (HD-MTX) or high Dose cytarabine (HD-Ara-C) and/or IT chemotherapy as well as irradiation or excision of the contralateral testis are highly recommended.[23] In stage III-IV diseases, systemic chemotherapy, scrotal radiotherapy, and intrathecal chemotherapy are performed.

Conclusion

In conclusion, Testicular lymphoma is a rarely encountered, aggressive extra nodal non-Hodgkin's lymphoma which should be considered for every patient who is admitted with a testicular mass, especially if they happen to be in advanced age. Misinterpretation of the clinical findings as orchitis could delay the definitive diagnosis. Primary testicular lymphoma is a disease with a poor prognosis. The rare incidence of the disease, its development and tumor behavior being different from the germ-cell cancers of the should be kept in mind for patients who present with a mass in the testis, and the urologist, pathologist, and oncologist should take joint action.

Conflict of interest: None declared

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Review Article

Can Post-Infectious Bronchiolitis Obliterans (PIBO) be Misdiagnosed as Persistent Pneumonia?

Rahat Bin Habib[1], ARM Luthful Kabir[2]

Abstract

Post-infectious bronchiolitis obliterans (PIBO) is a rare but severe chronic airway disease in children. It usually follows a severe viral lower respiratory tract infection in early life. Persistent inflammation and fibrotic remodeling of the small airways lead to narrowing, air trapping, and progressive loss of lung function. In recent years, reports from countries with high childhood infection burdens, particularly in Asia and Western countries, have drawn more attention to this condition. However, PIBO often remains under-recognized because its symptoms resemble asthma or other chronic lung diseases. This review summarizes available evidence on the epidemiology, risk factors, pathogenesis, clinical features, diagnosis, and management of PIBO in children. Literature was reviewed from published pediatric studies and case series across different regions. Several studies highlight hypoxemia and prolonged mechanical ventilation as strong predictors of disease. Recurrent viral infections, bacterial co-infections, and environmental exposures appear to increase vulnerability. The pathogenesis involves epithelial injury with neutrophil-driven inflammation and fibrosis, eventually producing fixed airway obstruction. Clinically, affected children present with a chronic cough, wheeze, tachypnea, and persistent hypoxemia that do not respond to bronchodilators. High-resolution computed tomography (HRCT) is considered the most reliable imaging tool, frequently showing mosaic attenuation, bronchiectasis or air trapping. Lung function testing usually confirms irreversible obstruction. Management remains largely supportive. Systemic corticosteroids, azithromycin, and some immunomodulatory approaches have been tried with variable outcomes. What is clear is that earlier recognition and intervention can help slow progression. More collaborative research is still needed before consistent pediatric guidelines can be developed.

Keywords: Post-Infectious Bronchiolitis Obliterans (PIBO); Misdiagnosed; Persistent Pneumonia.

Introduction

Bronchiolitis Obliterans (BO) is a rare lung disease characterized by inflammation and fibrosis of the small airways. This leads to airway narrowing and obliteration. There are three main types of BO: Post-Infectious Bronchiolitis Obliterans (PIBO), bronchiolitis obliterans post-lung transplantation (Graft Versus Host Disease-GVHD), and post-hematopoietic stem cell transplantation (HSCT).[1]

Postinfectious bronchiolitis obliterans (PIBO) is a permanent obstructive lung condition marked by inflammation beneath the airway lining and fibrotic constriction of the small airways. It typically develops following a lower respiratory tract infection in childhood, particularly in the early years of life.[2]

Globally, the incidence and prevalence of BO vary, with higher rates reported in children in developing countries following viral infections like adenovirus, rhinovirus, measle, RSV, Influenze, parainfluenza, mycoplasma pneumoniae.[3] In Bangladesh, while comprehensive data is scarce, PIBO appears to be an underdiagnosed condition. However, the high burden of respiratory infections in children makes it a condition of growing concern.[4] Although the precise incidence of PIBO in children remains unclear, studies have estimated the prevalence of BO to be 0.6% based on findings from 2,897 autopsies and 244 lung biopsies conducted at a single center, where BO was diagnosed.[5]

Understanding BO is crucial because its chronic nature often leads to long-term respiratory complications and

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Received Date : 14 March, 2025
Accepted Date : 30 March, 2025

reduced quality of life. Early diagnosis and management can potentially prevent disease progression and improve outcomes.[6]

Risk factors

Hypoxemia is considered the most critical risk factor for PIBO, followed by early prolonged mechanical ventilation. Recurrent viral infections, such as adenovirus, respiratory syncytial virus (RSV), and influenza in early childhood, along with bacterial co-infections, further increase the risk. Delayed treatment, exposure to environmental toxins, and immune suppression from chronic illnesses are also contributing factors. The use of glucocorticoids, gamma globulin, a history of recurrent wheezing, and being male may also play a role in PIBO development.[7,8]

Pathogenesis

The pathogenesis of postinfectious bronchiolitis obliterans (PIBO) begins with epithelial damage caused by infections in the lower respiratory tract, such as those from viruses or mycoplasma. This damage triggers the release of interleukin-8 (IL-8) and other inflammatory mediators from epithelial cells, attracting neutrophils and inflammatory cells to the small airways. These cells secrete matrix metalloproteinases (MMPs) and profibrotic cytokines, which degrade the matrix, lead to collagen accumulation, stimulate fibroblast growth, and eventually cause fibrosis around the bronchioles. CD8+ T cells play a key role in continued epithelial damage and chronic inflammation following infection, while Th17 cells promote tissue remodeling by releasing IL-17, which drives IL-8 production and contributes to airway neutrophilia.[9,10]

Clinical feature

Clinical features of PIBO in children include persistent cough, wheezing, and shortness of breath, often unresponsive to bronchodilators. These symptoms may follow a severe lower respiratory tract infection. Other signs include crackles on lung auscultation and hypoxemia, which can progress to chronic lung dysfunction.[11,12]

PIBO typically presents without a history of asthma, with the disease duration ranging from 7 to 31 months. Diagnosis is based on clinical criteria, including symptoms such as persistent tachypnea, cough, wheezing, exercise intolerance, and hypoxemia lasting for over 6 weeks following severe bronchiolitis or pneumonia.[13,14]

Investigation

Chest radiology identifies abnormalities in 92% of PIBO cases, typically displaying signs such as hyperinflation, patchy ground-glass opacities, bronchial wall thickening, atelectasis, and bronchiectasis. In contrast, High-Resolution Computed Tomography (HRCT) reveals abnormalities in 100% of cases, including patchy ground-glass densities, mosaic and vascular attenuation, air trapping, bronchial wall thickening, bronchiectasis, and mucus plugging. These detailed imaging characteristics position HRCT as the most reliable diagnostic tool for detecting PIBO providing greater diagnostic accuracy than conventional chest X-rays.[15,16]

Lung function tests in PIBO patients typically reveal characteristic patterns. Spirometry often shows a fixed obstructive flow-volume curve, with reduced forced expiratory volume (FEV1), a lower Tiffeneau index (FEV1/VC), and decreased end-expiratory flow (MEF25). Body plethysmography indicates hyperinflation and air trapping, evidenced by an elevated residual volume (RV) and an increased functional residual capacity (RV/TLC). These findings reflect irreversible airway obstruction commonly seen in PIBO, making such tests crucial for diagnosing and assessing disease severity in affected individuals.[1,2,3]

Spirometry primarily evaluates obstruction in the larger airways but is generally less sensitive in detecting small airway obstruction. For better assessment of small airway conditions, such as in cystic fibrosis, primary ciliary dyskinesia, and chronic obstructive pulmonary disease, the Multiple Breath Washout test can be employed if available. In pediatric patients, the Forced Oscillation Technique (FOT) offers an advantage over spirometry, as it does not require complex respiratory maneuvers. Instead, small amplitude pressure oscillations are applied during normal breathing, making it a more suitable option for assessing lung function in children.[17,18,19]

When resources permit, the Multiple Breath Washout test can be utilized to pinpoint small airway issues commonly seen in conditions like cystic fibrosis, primary ciliary dyskinesia, and chronic obstructive pulmonary disease[20,21]. For children, the Forced Oscillation Technique (FOT) offers a significant advantage over traditional s pirometry, as it does not necessitate specific respiratory maneuvers. Instead, it employs small amplitude pressure oscillations during normal breathing, making it easier and more effective for evaluating lung function in pediatric patients.

Treatment

Bronchoscopy combined with bronchoalveolar lavage (BAL) is widely accepted as a necessary procedure to exclude ongoing infections caused by viral, fungal, or bacterial agents prior to initiating systemic anti-inflammatory therapy. This approach ensures that any underlying infections are identified and addressed, optimizing treatment outcomes and preventing complications associated with inappropriate anti-inflammatory use.[22]

As Post Infectious Bronchiolitis Obliterans (PIBO) is an uncommon, chronic, and irreversible obstructive lung condition, treatment approaches remain somewhat undefined and vary in different medical centers. Generally, management of PIBO involves a combination of optimal supportive care and anti-inflammatory therapies aimed at inhibiting lymphocyte activation and proliferation. Addressing inflammation is crucial, as it significantly contributes to the disease process and can impact overall lung function and patient quality of life. This multifaceted treatment strategy is essential for improving outcomes and managing symptoms in individuals affected by PIBO.[23]

Conclusion

In conclusion, Post Infectious Bronchiolitis Obliterans (PIBO) is a significant cause of chronic respiratory distress in children, often following severe viral infections. It should be suspected in cases where symptoms such as persistent cough, wheezing, tachypnea, and hypoxemia persist for more than six weeks post-infection, unresponsive to conventional treatments. Exclusion of other conditions such as asthma, tuberculosis, cystic fibrosis, primary immunodeficiency, and primary ciliary dyskinesia is essential for diagnosis. Early recognition and appropriate management of PIBO are crucial for preventing long-term lung damage and improving patient outcomes.

Radiological imaging, particularly Chest X-ray (CXR) and High-Resolution Computed Tomography (HRCT), plays a crucial role in diagnosing Post-Infectious Bronchiolitis Obliterans (PIBO). These imaging modalities reveal key features such as hyperinflation, ground-glass opacities, bronchial wall thickening, mosaic attenuation, air trapping, bronchiectasis, and mucus plugging. HRCT is especially valuable in detecting the extent of lung damage and differentiating PIBO from other chronic lung conditions. Early and accurate radiological assessment is essential for guiding treatment and managing the long-term consequences of PIBO effectively.

Supportive treatment for Post-Infectious Bronchiolitis Obliterans (PIBO) includes supplemental oxygen therapy for hypoxemia, nutritional support to maintain growth, immunizations against influenza and pneumonia, and airway clearance techniques to manage mucus plugging. Anti-inflammatory treatments play a key role and may involve systemic corticosteroids, azithromycin, and combination therapy like FAM (Furosemide, Azithromycin, Methylprednisolone). Immunoglobulin substitution and steroid-sparing agents are also considered in select cases to reduce inflammation and improve lung function. These interventions aim to alleviate symptoms, prevent complications, and enhance long-term respiratory outcomes in PIBO patients.

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Abstracts

Genetic testing in a national cohort of adults with chronic kidney disease of unknown origin

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Background: Chronic kidney disease (CKD) remains unexplained in at least 20% of patients. Massively parallel sequencing (MPS) can be a valuable diagnostic tool in patients with unexplained CKD, but prospective data from routine clinical practice are limited. We aimed to determine the diagnostic yield and relevance of MPS-based gene panel testing in patients with unexplained CKD in a real-world context. We additionally examined barriers to implementation of genetic testing.

Methods: In this prospective cohort study, we recruited patients with unexplained CKD (estimated glomerular filtration rate <60 ml/min/1.73 m^2 without underlying clinical diagnosis) with onset at <50 years of age who underwent MPS-based multigene panel testing from 11 academic and non-academic hospitals across the Netherlands. In patients with a (likely) pathogenic variant, we verified that the variant likely explained the clinical phenotype. A nationwide online survey was sent to all Dutch nephrologists and residents to investigate potential barriers for gene panel testing.

Results: A diagnostic variant was identified in 59/340 participants (17%). Most common diagnostic variants were in *NPHP1* (13 patients), *COL4A3* (12 patients), *COL4A4* (5 patients), *COL4A5* (6 patients) and *PAX2* (5 patients). A genetic diagnosis led to at least one clinical consequence in 73% of patients. Main barriers reported by Dutch nephrologists (N = 71) included genetic illiteracy (53%), difficulties with test selection (51%) and a lack of time (43%).

Conclusions: MPS-based multigene panel testing yielded a genetic diagnosis in 17% of patients with unexplained CKD. Our findings support the relevance of MPS in the diagnostic workup of adults with unexplained CKD with onset at <50 years of age. Additionally, our results underline the need to improve genetic education among nephrologists to better the implementation of MPS-based diagnostic testing in clinical practice.

Keywords: chronic kidney disease, diagnostic yield, exome sequencing, genetics, massively parallel sequencing

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Comparison of NAFLD, MAFLD, and MASLD Prevalence and Clinical Characteristics in Asia Adults

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Background/Aims: The principal limitations of the term non-alcoholic fatty liver disease (NAFLD) are the reliance on exclusionary confounder terms and the use of potentially stigmatizing language. Within three years, NAFLD went through two name changes, from NAFLD to metabolic-dysfunction-associated fatty liver disease (MAFLD) to metabolic dysfunction-associated steatotic liver disease (MASLD). However, there is no Asian consensus statement on the renaming of MASLD, and evidence on the epidemiology and characteristics in the Asia population under different diagnostic criteria remain limited. This study aimed to fill these gaps by analyzing the prevalence and characteristics of MASLD, NAFLD, and MAFLD in an Asian population.

Methods: A retrospective, cross-sectional study was conducted in regional China with participants from the health management database in 2017–2022. Demographic and laboratory metabolic profile and body composition data were obtained. Hepatic steatosis were diagnosed by ultrasound. The likelihood of having fibrosis was assessed using the NAFLD fibrosis score (NFS). Recently proposed criteria for metabolic dysfunction-associated steatotic liver disease (MASLD) were applied.

Results: A total of 20,226 subjects were included for final analysis. 7465 (36.91%) participants were categorized as MASLD patients, 10,726 (53.03%) participants were MAFLD, and 7333 (36.26%) participants were NAFLD. Compared with MAFLD, body composition of MASLD and NAFLD patients were obviously different. MASLD patients were older, had a higher body mass index and percentage of male gender, and had a higher ALT, diastolic blood pressure, triglyceride, and waist circumference but lower High-Density Lipoprotein Cholesterol (HDL-C) than non-MASLD patients. Using binary regression analysis, we found for the first time that putative bone mass (OR = 4.62, 95CI% 3.12–6.83) is associated with the risk of developing MASLD. The area under the receiver operating curve (AUC) for predicting cardiovascular outcomes (CV) was 0.644 for MAFLD and 0.701 for MASLD.

Conclusion: MASLD (36.91%) prevalence was closed to NAFLD (36.26%) and lower than MAFLD (53.03%). Presumed bone mass might be the predictor of disease progression in MASLD patients. MASLD better identifies patients likely to have a higher risk of metabolic disorders or CV events.

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AWMC thankfully acknowledge the respected reviewers for their eminent contributions to this volume

1. **Prof. Dr. Mahmuda Hassan**
   Professor, Department of Paediatrics
   Ad-din Women's Medical College, Dhaka

2. **Prof. Dr. Md. Mazharul Islam**
   Professor & HOD, Department of Forensic Medicine
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3. **Dr. Tania Noor**
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