ISSN 2313-4941

Volume 13 Number 1 January 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 1, January 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

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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.

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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.

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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

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(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

Editorial action

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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Accepted papers will be the permanent property of the Journal of Ad-din Women's Medical College. By submitting the manuscript, the authors agree that once the article is accepted for publication, copyright of their article is automatically transferred to the Ad-din Women's Medical College, Dhaka.

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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**
   No of references: 35
   Abstract: Yes, 250 words
   Maximum number of printed pages: 5 (=14 msw pages*) approx. 4500 words
   Headings: Yes
   Keywords: Yes

2. Type of article: **Mini commentary focusing articles published in the journal**
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   Key notes: No
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3. Type of article: **Brief report**
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   Key notes: No
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   Keywords: No

5. Type of article: **Clinical overview**
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   Key notes: No
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   Headings: No
   Keywords: Yes

6. Type of article: **Review article**
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   Keywords: Yes

7. Type of article: **Mini review**
   No of references: 30
   Abstract: Yes, 200
   Key notes: Yes
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   Keywords: Yes

8. Type of article: **Case report**
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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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   Abstract: No
   Key notes: Yes
   Maximum number of printed pages: 1 printed page, or maximum 1000 words
   Headings: No
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10. Type of article: **Commentary**
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    Key notes: No
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    Headings: No
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11. Type of article: **Perspective**
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    Key notes: No
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12. Type of article: **Reader's forum**
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    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
    Maximum number of printed pages: 2 printed page, or maximum, 1000 words
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    Keywords: No

14. Type of article: **Different view**
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    Key notes: No
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    Headings: Yes
    Keywords: No

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

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

Microplastic: A Burning Issue of Present Era

Mahmuda Hassan

Introduction

Plastic products were introduced in the market around 1950. As the days are passing, it has becoming a burden on the nature. It is now incorporated in the soil, livestock, and seawater as well as in the human body. Plastic pollution has emerged as a pervasive global concern due to the indiscriminate use of plastics, with unplanned plastic waste disposal contributing to the generation of microplastic particles (MPs)[1].

Plastic pollution has emerged as an inescapable global concern, with plastic waste contributing to the generation of microplastic particles (MPs) that have now integrated easily into the human food chain. MPs are usually defined as plastic particles and fibers with a size between 0.001 µm to 5000 µm, so they are small enough to be easily overlooked, but they can have significant environmental and health consequences. As a result, every human being is at risk of exposure and its harmful impacts from newborn to geriatric age group. Among them, the more vulnerable groups are pregnant mothers, newborn babies, and children[2].

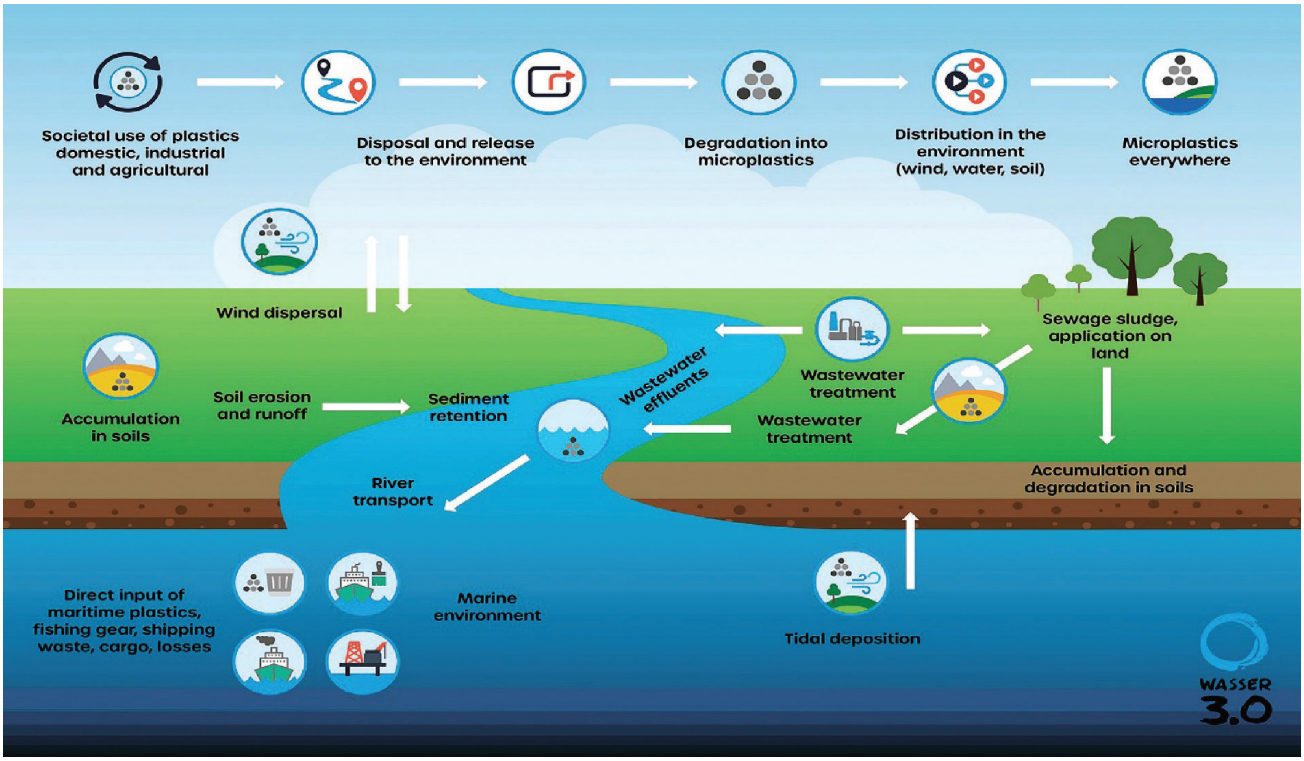

Figure 1: Distribution pathways of microplastics in the environment (Source: Wasser 3.0)

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Received Date : 20 September, 2024

Accepted Date : 30 September, 2024

How microplastics are getting into the human body?

In order to understand how to reduce our exposure to these tiny particles, it is important to know the route of

entry of MPs into the human body. There are three identified routes:

1. **Inhalation:** Microplastics present in the air enter the human body through this route. MPs are released at an alarming rate by synthetic fabrics.
2. **Ingestion:** Enters via food, water and drinks, but also via directly sucking on plastic and polyester products. The innocent-looking teddy, as well as other toys for the children, including plastic teethers, are chewed by the children. These are made from polyester and cause the shedding and swallowing of thousands of MPs. Seafoods are found to be a source of MPs ingestion in the human body.
3. **Skin contact:** The tiny plastic particles have been shown to cross the skin barrier and enter the bloodstream. Our skin is very porous and permeable to a wide range of substances like medicines and poisons, as well as MPs, and they are absorbed into our body within a very short period of time after coming in contact.

The widespread usage of plastic products, inappropriate disposal, and their persistence in nature make plastic pollution a global issue and a worldwide threat to aquatic ecosystems [3]

It is estimated that an average of 5 to 13 million tons of plastic enter the world's oceans each year. [4]

Plastic materials are producing mechanical problems in the environment, but breakdown products of plastic in the form of microplastic and nanoplastic (size<0.001µm) are creating the main health hazards, depending on their molecular weight, chemical structure, crystallinity, additives, and functional groups.

In one study, postpartum breast milk was analyzed for MPs using Raman micro-spectroscopy. The relationship between MP detection, maternal hygiene, breastfeeding complications, and bacterial microbiota was examined, and MPs were detected in 38.98% (23 of 59) of the breast milk samples.[5]

Another preliminary study involved the analysis of human breast milk samples collected from 15 healthy breastfeeding mothers of the fishing community (BMSF) with daily habits of seafood consumption and 8 healthy breastfeeding mothers (BMSH) with no history of seafood consumption in the past few months, and analyzed using microscopy and micro-Fourier-transformed infrared spectroscopy. In the BMSF group, a total of 276 MPs were found, while 49 MPs were found in the BMSH group, indicating a substantial difference in MP presence. [6]

Impact of microplastics on human health

- **Inflammation**: Can lead to heart disease, cancer, and autoimmune disorders.
- **Oxidative stress**: Due to production of free radicals, MPs can damage cells and DNA, leading to neurodegenerative diseases and reproductive problems.

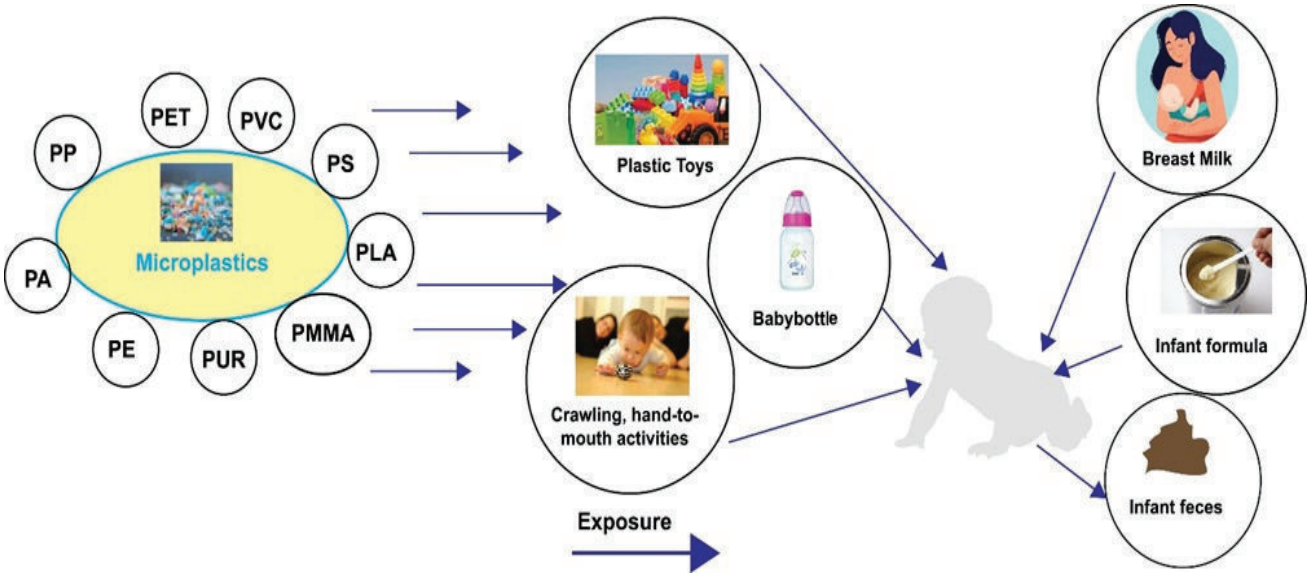

Figure 2: Sources of MPs that are producing health hazards for the children, including breast milk [7]

- **Endocrine disruption**: Can affect reproductive health of reproductive age group, as well as growth and development of the children.
- **Carcinogenesis**: Can be caused by chemicals in plastics.
- **Genotoxicity**: Can cause mutations of the gene that lead to cancer.

Presence of microplastics in breast milk can potentially affect neonates by disrupting their gut microbiome, potentially impacting their immune system, and raising concerns about potential developmental issues due to the ingestion of these plastic particles.

MPs can physically irritate the gut lining, with the sharp edges of these particles triggering micro-abrasions that interrupt the integrity of the gut barrier. On top of that, MPs can carry and release harmful chemicals, such as heavy metals and persistent organic pollutants (POPs), which further damage the gut endothelium and contribute to oxidative stress and inflammation.[8]

Microplastic pollution poses a serious threat to human health, with its presence in nature, including breast milk raising concerns for children. To minimize exposure, reducing plastic use, improving waste management, and raising awareness are crucial. Collective actions are needed for the safeguarding of environment, future generations, and human health.

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Original Article

Academic Backwardness among Students of Dhaka Medical College: A Retrospective Cohort Study

Dr. Syeda Rumana Hoque[1], Dr. Sujit Kumar Sarker[2], Dr. Mst. Zobaida Akter[3], Dr. Shehreen Ahmed[4], Dr. Palash Kumar Biswas[5], Dr. Zakaria Mawla Chowdhury[6]

Abstract

Background: Socio-economic challenges, inadequate early education, poor teaching quality, outdated curricula, insufficient infrastructure, limited technological access, and political instability influence academic backwardness among medical students in developing countries like Bangladesh. Financial constraints and family responsibilities hinder students' focus and resources. Educational systems often rely on learning and lack well-trained faculty and modern facilities. Additionally, language barriers and psychological stress further impact student performance. Efforts to address these issues include financial aid, teacher training, curriculum reforms, infrastructure improvements, and mental health support, all aimed at creating a supportive and effective learning environment.

Objective: To evaluate the profile and socio-demographic characteristics in terms of students' academic performance.

Materials and Methods: A retrospective cohort study was conducted among students of Dhaka Medical College over six months (July 1, 2023 - December 31, 2023). All undergraduate medical students in their 3rd, 4th, and 5th years at Dhaka Medical College who had lost at least one academic year were included in the study. The sample size was 46. Data were collected using a mixed questionnaire for appropriate statistical analysis.

Results: Most respondents 36 (78.3%) were aged 24-26, predominantly male 26 (56.5%), unmarried 38 (82.6%), and from nuclear families 44 (95.7%) with well-educated parents. Academic performance showed that only 5 (23.8%) passed the final exam on the first attempt. The range of academic year loss was 1-5 years. Key challenges included subject comprehension difficulties 15 (32.6%), pre-exam study habits 36 (78.3%), and nervousness during oral exams 42 (91.3%), along with familial issues like illness 20 (43.5%) and financial constraints 12 (26%).

Conclusion: The study highlights that medical students from well-educated families face substantial academic and personal challenges, leading to significant delays in their education. This underscores the urgent need for support systems and focused interventions to address these issues effectively.

Keywords: Academic backwardness, Professional examination, Language barrier, Medical students

Introduction

Academic backwardness is a significant issue among parents and teachers in today's competitive society. If a child's performance at school falls below expectations, it is considered academic backwardness.[1,] It exists in almost every institution and is more severe in those that provide professional education.[2] Academic backwardness is influenced by multiple factors, including personal, familial, and financial stressors. Admission to medical colleges in Bangladesh is highly competitive, requiring strong academic performance.[3] However, academic backwardness and repeated failures in professional examinations are major concerns. This academic backwardness leads to adverse emotional and social consequences for individual students and institutions.[4] Since the magnitude of the problem is not clearly documented in our country, this study aims to explore academic backwardness among undergraduate medical students and identify problem areas so that remedial measures can be implemented.

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Received Date : 20 August,2024

Accepted Date : 30 August,2024

Materials and Methods

A retrospective cohort study was conducted among undergraduate medical students of Dhaka Medical College

over six months, from July 1, 2023, to December 31, 2024. Students from the sessions 2015-16 to 2019-20 were included in the study. Purposive sampling was done with the following inclusion criteria: (1) students who had appeared in the 1st, 2nd, 3rd, and 4th professional examinations between May 2017 and May 2021 and (2) those who had lost at least one academic year. Students who did not provide informed written consent were excluded from the study. All information was kept confidential, and ethical clearance was obtained from the Ethical Review Committee of Dhaka Medical College.

Results

Regarding socio-demographic characteristics, most respondents 36 (78.3%) were aged between 24 to 26 years. Out of 46 respondents, 26 (56.5%) were male and 20 (43.5%) were female. Most respondents 38 (82.6%) were unmarried, and most 44 (95.7%) resided in nuclear families. Fathers predominantly work in service 25 (55.6%) or business 15 (33.3%), with 37 (80.4%) having a graduate-level education or higher. Mothers are mostly homemakers 38 (82.6%), though 6 (13.0%) are in service and 2 (4.3%) in business, with 24 (52.2%) having graduate-level education or higher (Table 1).

Table 1 : Sociodemographic characteristics of the respondents

Variables		Observation (n=46)
Age, years	21 - 23	4 (8.70%)
	24 - 26	36 (78.3%)
	≥27	6 (12.0%)
Sex	Male	26 (56.5%)
	Female	20 (43.5%)
Marital status	Married	8 (17.4%)
	Unmarried	38 (82.6%)
Family types	Nuclear	44 (95.7%)
	Joint	2(4.30%)
Occupation, father	Service	25 (55.6%)
	Business	15 (33.3%)
	Farmer	1 (2.20%)
	Other	4 (8.90%)
Education, father	Up to primary	2 (4.30%)
	SSC	3 (6.50%)
	HSC	4 (8.70%)
	Graduate & above	37 (80.4%)
Occupation, mother	Service	6 (13.0%)
	Business	2 (4.30%)
	Home Maker	38 (82.6%)
Education, mother	Illiterate	1 (2.20%)
	SSC	2 (4.30%)
	HSC	16 (34.8%)
	Graduate & above	24 (52.2%)

Among the 46 respondents, 33 (71.7%) successfully passed the first professional examination. Of these, 30 (90.9%) also cleared the second professional examination. Among those 30 students, 21 (70%) passed the third professional examination. However, among the 21 respondents who attempted the final professional examination, only 13 (23.8%) were successful (Table 2).

Table 2: Distribution of the respondents by their professional examination results

Variables	Passed	Not passed
First professional examination, ($n_=46$)	33 (71.7%)	13 (28.3%)
Second professional examination, ($n_=33$)	30 (90.9%)	3 (9.10%)
Third professional examination, ($n_=30$)	21 (70.0%)	9 (30.0%)
Final professional examination, ($n_=21$)	5 (23.8%)	16 (76.2%)

The table presents the number and percentage of respondents based on the number of attempts they need to pass each stage of their professional examinations.

In the first professional examination, 10 (30.3%) of the respondents passed on their first attempt. The majority 14 (42.4%) passed on their second attempt.7 (21.2%) needed three attempts, while 2 (6.1%) required four attempts. This indicates that less than one-third of the students passed on the first attempt, suggesting that the examination posed a significant challenge for many.

In the Second professional examination, a slightly higher percentage 10 (33.3%) passed on their first attempt compared to the first exam. The majority 18 (60.0%) required two attempts, showing an improvement in success rates compared to the first exam. Only 2 (6.7%) needed three attempts, indicating that most students passed within two attempts.

In the third professional examination, only 3 (14.3%) passed on their first attempt. The majority 15 (71.4%) passed on their second attempt, making it the most common outcome.

In the final professional examination, none of the respondents passed on the first attempt. The majority 4 (80.0%) required two attempts, while 1 (20.0%) needed three attempts.

Overall, success rates on the first attempt were generally low across all professional examinations, with the second

and third exams having the highest second-attempt pass rates (Table 3).

Table 3: Times required to pass in professional examination by the respondents

Variables	Observation (n=46)
Times required to pass the first professional examination (n=33)	
1-time	10 (30.3%)
2-times	14 (42.4%)
3-times	7 (21.2%)
4-times	2 (6.10%)
Times required to pass the second professional examination (n=30)	
1-time	10 (33.3%)
2-times	18 (60.0%)
3-times	2 (6.70%)
Times required to pass the third professional examination (n=21)	
1-time	3 (14.3%)
2-times	15 (71.4%)
3-times	3 (14.3%)
Times required to pass the final professional examination (n=5)	
2-times	4 (80.0%)
3-times	1 (20.0%)

Figure 1 illustrates the distribution of academic years lost by respondents. The most commonly reported academic loss was 2-3 years, affecting 17 (37.0%) of the respondents. A notable 15 (32.6%) of respondents experienced a loss of less than 2 years, while a smaller proportion 3 (6.5%) faced a loss of 3-4 years. Additionally, 11 (23.9%) of respondents reported an academic loss of 4 or more years, indicating a significant disruption in their education.

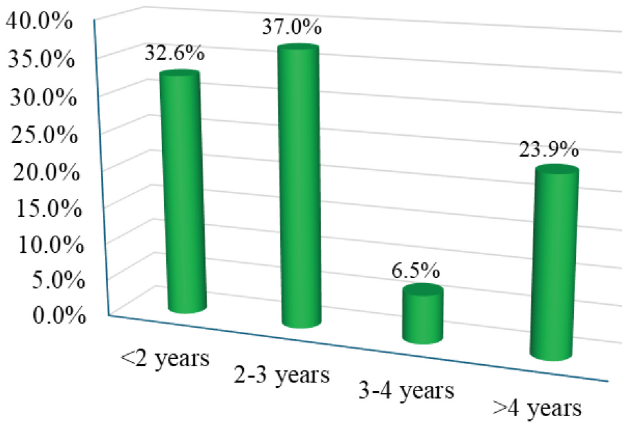

Figure 1: Academic year lost by the respondents

Nearly one-third of the respondents 15 (32.6%) reported difficulties in understanding the subject or teachers' language, while 6 (13%) felt that the coursework was beyond their capacity. The majority 36 (78.3%) studied only before examinations, and 42 (91.3%) experienced nervousness during oral exams. Half of the students 25 (54.3%) found the teaching method boring (Table 5).

Table 5: Academic reasons stated by the respondents

Reasons	Yes	No
Difficulties in understanding the subject	15 (32.6%)	31 (67.4%)
Difficulties in teacher's language	15 (32.6%)	31 (67.4%)
Studies beyond capacity	6 (13.0%)	40 (87.0%)
Habit of study at exam time	36 (78.3%)	10 (21.7%)
Slow in writing	19 (41.3%)	27 (58.7%)
Nervousness in oral examination	42 (91.3%)	4 (8.70%)
Boring teaching method	25 (54.3%)	21 (45.7%)
Long class hour	12 (26.1%)	34 (73.9%)
Poor language skill	13 (28.3%)	33 (71.7%)
Biasness of teacher	16 (34.8%)	30 (65.2%)
Bad behavior of classmate	14 (30.4%)	32 (69.6%)
Political interference	22 (47.8%)	24 (52.2%)
Failure to adjust in new environment	28 (60.9%)	18 (39.1%)
Disliking medical education	12 (26.1%)	34 (73.9%)

About 28 (61%) of students struggled to adjust to a new environment, and nearly half 22 (47.8%) faced issues related to political interference. Other challenges included bias from teachers 16 (34.8%), disruptive behavior from classmates 14 (30.4%), poor language skills 13 (28.3%), dislike for medical education 12 (26%), and long class hours 12 (26%) (Table 5).

Regarding familial and personal issues, 20 (43.5%) cited a family member's illness as a significant concern. Additional problems included neglect from family members 16 (34.8%), involvement in romantic relationships 13 (28.3%), household responsibilities 13 (28.3%), adverse home environments 12 (26%), financial constraints 12 (26%), tutoring commitments 10 (21.7%) and family disputes 9 (19.6%). About 5 (11%) students who got early marriage, all were female (Table 6).

Table 6: Familial reasons stated by the respondents

Familial reasons	Yes	No
Adverse home environment	12 (26.1%)	34 (73.9%)
Engagement in household activities	13 (28.3%)	33 (71.7%)
Family dispute	9 (19.6%)	37 (80.4%)
Financial constraints	12 (26.1%)	34 (73.9%)
Engagement in family occupation	10 (21.7%)	36 (78.3%)
Ill health of family member	20 (43.5%)	26 (56.5%)
Negligence of family member	16 (34.8%)	30 (65.2%)
Busy in tuition	10 (21.7%)	36 (78.3%)
Love affair	13 (28.3%)	33 (71.7%)
Early marriage	5 (10.9%)	41 (89.1%)

Discussion

Respondents faced the most difficulty in passing the final professional examination, followed by the first professional examination. The first professional examination represents the students' first experience with high-stakes assessment, where they must face both internal and external examiners. Nervousness during oral examinations was a significant factor contributing to academic backwardness, consistent with findings from a study by *Miah et al*.[3] The final professional examination assesses overall knowledge, skills, and attitudes, requiring proper self-motivation and guidance to overcome previous academic setbacks.

Most respondents required two attempts to pass professional examinations, while a few required four attempts to pass the first professional examination. The majority of students experienced an academic loss of 24 months, with a range of 12 to 60 months. Globally, medical schools are under pressure to reduce student failure rates. A study conducted by *Baars et al*. found that out of 1,819 students, 267 failed to pass the first-year medical curriculum within two years.[5]

Miah et al. also reported that factors contributing to academic backwardness among medical students include poverty, illness of parents, inability to face viva exams, failure to adjust to a new environment, difficulty understanding subjects, marriage and pregnancy, lack of interest in medical education, love affairs, teacher partiality, and political interference.[3] In the present study, the top five academic challenges were nervousness in oral examinations, last-minute study habits, failure to adjust to a new environment, dissatisfaction with teaching methods, and political interference.

Limitations

One limitation of the study is its exclusive focus on students from Dhaka Medical College, Bangladesh, which may restrict the generalizability of findings to all medical students in Bangladesh. Moreover, relying on self-reported data could introduce bias and inaccuracies regarding academic and personal challenges. Additionally, the study's design limits its ability to establish causal relationships or track changes among the surveyed students over time.

Conclusion

This study demonstrates that medical students from Dhaka Medical College, despite coming from well-educated families, encounter significant academic and personal challenges, leading to substantial delays in their education. Only a small percentage pass the final exam on the first attempt, with primary issues including subject comprehension difficulties, exam-related anxiety, and familial problems such as illness and financial constraints. These findings highlight the necessity for improved support systems and targeted interventions.

Recommendations

Further studies are needed, including all the public and private medical colleges to adopt appropriate strategies.

Acknowledgement

The authors are thankful to the office staffs of students'

section of Dhaka Medical College, Dhaka for their support for this research.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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Original Article

Practices on Prevention and Control of Diarrheal Diseases among Adult Population in A Selected Rural Area of Bangladesh

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Abstract

Background: Diarrhea is a waterborne disease that can be transmitted through biological and chemical contamination. Bangladesh has conditions favorable for the rapid transmission of enteric pathogens through the fecal-oral route. Infection may be transmitted during bathing, washing, drinking, in the preparation of food, or the consumption of contaminated food.

Objective: To assess the knowledge and practices regarding prevention and control of diarrheal diseases among the adult population in a selected rural area of Bangladesh.

Materials and Methods: It was a cross-sectional descriptive study conducted among 428 adult respondents. Data was collected by semi-structured questionnaire by face-to-face interview. This study was conducted between July and October 2023.

Results: In this study highest number of the respondents 170 (39.7%) were within the age group of 21-35 years. The mean (±SD) age of the respondents was 37.77 (± 20.78) years. The highest number of the respondents had secondary level education 144 (33.6%). The mean (±SD) monthly family income of the respondents was 23,327.58 (±27,10708.86) TK. Most of the respondents heard about hand hygiene 415 (97.0%). Regarding sources of drinking water, 257 (60%) used deep tube well water,138 (32.2%) drank direct supply water and 185 (43.2%) drank filter water. A few respondents 27 (6.3%) did not take ORS during diarrhea.

Conclusion: Almost all the respondents heard and knew about diarrheal diseases. The majority of the respondents' knowledge and practice about diarrheal diseases was satisfactory. As per the present study necessary measures should be taken against those who have not used ORS during diarrhea and improve their basic sanitation and personal hygiene.

Keywords: Diarrhea, Adult, Knowledge, Practice

Introduction

Globally, diarrhea is the second most common cause of death and illness.[1] Although diarrheal diseases are common among children and older adults, death due to diarrhea is three times more common among older adults specifically among those who belong to the population above 70 years of age than children under five years of age.[2] 'Shigella is the most common cause of diarrhea in older individuals and is responsible for 18.4 deaths per 100,000 people. Infection can occur through untreated water, spoiled food, or personal contact.[3] Numerous bacterial, viral, and parasitic species are also responsible for it.[4,5,6,7] In order to prevent diarrhea in older persons, the Ministry of Health and Family Welfare of the Government of India's current guidelines for managing the condition suggest taking a salt solution and taking zinc supplements.[8] According to a prior study based on a global systematic review, hand washing mitigates diarrhea by 40%; but hand cleaning after coming into touch with excreta is not widely practiced worldwide.[9] According to the data, this disease can be readily avoided by practicing safe drinking water, hand washing, good hygiene, and improved sanitation.[10]

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Received Date : 5 August 2024

Accepted Date : 25 September 2024

A major contributor to malnutrition and a major cause of childhood morbidity and mortality in poor nations are diarrheal illnesses. In many nations, cholera and other forms of diarrhea are major causes of morbidity in older adults and children. Prolonged diarrhea combined with malnourishment and bloody diarrhea (dysentery) are also significant causes of death. Dehydration causes a lot of diarrheal deaths. The finding that dehydration from acute diarrhea of any cause and at any age, with the exception of severe instances, may be safely and successfully treated in more than 90% of cases by the straightforward technique of oral rehydration with a single fluid is a significant advancement. An oral rehydration salt (ORS) solution is created by dissolving glucose and a number of salts in water. Additionally, the new ORS solution lowers stool volume by 20% and vomiting by 30%. The WHO and UNICEF have now formally endorsed this new decreased (low) osmolality ORS solution, which contains 75 m eq/l of sodium and 75 milli mol/l of glucose. Any reference to ORS/ORT in this updated publication refers to this new reduced (low) osmolality ORS solution.[11]

With over 4.6 million fatalities per year, diarrhea was the world's largest cause of infant mortality in 1980. Nowadays, 15% to 30% of mortality in children under five is caused by diarrhea. Oral Rehydration Therapy (ORT), which was first launched in 1979, has emerged as the mainstay of diarrhea control programs. Over the past few decades, efforts to prevent diarrhea have been founded on a number of potentially effective therapies.

Diarrhea-related mortality was also impacted by other measures, such as enhanced supplemental feeding, vitamin A supplementation, measles vaccination, breastfeeding promotion, safe water supply, and fecal disposal. Diarrhea accounts for one-third of all child fatalities in Bangladesh. An average rural child experiences 4.6 bouts of diarrhea a year, which results in over 230,000 child deaths. [12]

Challenges like high population density, which puts more people in a smaller area, solid waste production, unsanitary conditions, and a growing need for water supply and sanitary facilities are all visible. It is one of the primary causes of the high prevalence of waterborne illnesses like cholera, typhoid, dysentery, and diarrhea among the impoverished in both rural and urban areas. A reliable water supply is unavailable to about 1.1 billion people (one-sixth of the world's population), and 2.4 billion people (two-fifths) do not have access to sanitary facilities (WHO and UNICEF). Most of these individuals reside in Asia and Africa. Water-related illnesses are a challenging problem for developing nations in Asia and Africa, for instance. [13]

Materials and Methods

It was a cross-sectional descriptive type of study that was conducted in Keraniganj Upazila, Dhaka, Bangladesh. The total period of study was 4 months, from July to October 2023, and the sample size was 428. The study population was adult people who reached or completed his/her 20th birthday. A purposive non-probability sampling method was used for selecting the sample. Data were collected by face-to-face interviews. A semi-structured questionnaire was developed to collect data according to the objectives of the study. The questionnaire was pre-tested, and necessary modifications were done before finalization. After explaining the purpose of the study, written and verbal consent was obtained from the respondents. The research protocol was approved by the Community Medicine department of Ad-din Women's Medical College.

Result

The participant's ages ranged from below 20 to 65 years or older, with a mean age of 37.77 ± 20.78 years**.** The majority belonged to the 21–35 years age group which is 170 (39.7%)**,** followed by 36–50 years 113 (26.4%)**.** A smaller proportion was aged ≥65 years 33 (7.7%)**.** The study sample was predominantly female 283 (66.1%)**,** while male participants constituted 145 (33.9%) of the total population. The study sample comprised mostly

Table I: Socio-demographic characteristics of the respondents. (n=428)

Variables		Frequency (%)
Age group	≥20	43 (10%)
(years)	21-35	170 (39.7%)
	36-50	113 (26.4%)
	51-64	69 (16.2%)
	≥65	33 (7.7%)
	Mean (±SD)	37.77 (±20.78)
Gender	Male	145 (33.9%)
	Female	283 (66.1%)
Religion	Muslim	411 (96.0%)
	Hindu	17 (4.0%)
Education	Illiterate	106 (24.8%)
	Primary Education	139 (32.5%)
	Secondary Education	144 (33.6%)
	Graduate	27 (6.3%)
	Post-Graduate	12 (2.8%)
Occupation	Housewife	249 (58.2%)
	Business	50 (11.7%)
	Service holders	30 (7.0%)
	Farmers	10 (2.3%)
	Others	89 (20.8%)

females 283 (66.1%), with males making up 145 (33.9%). A significant proportion of participants had primary 139 (32.5%) or secondary education 144 (33.6%), while 106 (24.8%) were illiterate. A smaller fraction had graduate 27 (6.3%) or postgraduate 12 (2.8%) qualifications. The most common occupation was housewife 249 (58.2%), reflecting the high female representation in the sample.

Table 02 presents the distribution of respondents based on their knowledge of personal hygiene practices. The findings indicate that participants have a high level of awareness of key hygiene behaviors. The majority 420 (98.1%) reported washing their hands before meals, while only 8 (1.9%) did not practice this habit. Similarly, 422 (98.6%) of respondents washed their hands after defecation, with only 6 (1.4%) not adhering to this practice. These high percentages suggest a strong awareness of hand hygiene, which is crucial for preventing infectious diseases. 398 (93.0%) of participants reported keeping food covered, while 30 (7.0%) did not. 383 (89.5%) of respondents practiced proper disposal of garbage, whereas 45 (10.5%) did not. This indicates that while most individuals understand the importance of food hygiene, a small proportion still engage in risky practices that may lead to food contamination.

Table 02: Distribution of the respondents by their knowledge about Personal hygiene (n=428)

Variables	Yes (%)	No (%)
Washing hands before meal	420 (98.1)	8 (1.9)
Washing hands after defecation	422 (98.6)	6 (1.4)
Keep food covered	398 (93.0)	30 (7.0)
Proper disposal of garbage	383 (89.5)	45 (10.5)

Table 03 presents the distribution of the study population based on their source of drinking water and the type of latrine used. The majority of respondents 257 (60.0%) rely on deep tube wells for drinking water, which is generally considered a safer source compared to surface water. The majority 367 (85.7%) use sanitary latrines, reflecting good hygiene practices. Overall, the data suggest that while a significant portion of the population has access to improved water and sanitation facilities, there is still a small group using unsafe water sources and suboptimal latrines, highlighting areas for public health intervention.

Table 03: Distribution of the respondents by their practices about basic sanitation (n=428)

Variables	Frequency (%)
Source of drinking water	
Tap Water	169 (39.5%)
Deep Tube Well	257 (60.0%)
Pond Water	2 (.5%)
Type of latrine used	
Sanitary latrines	367 (85.7%)
Tin shed latrines	48 (11.3%)
Kacha latrines	13 (3.0%)

A majority of 337 (78.7%) of respondents reported using ORS to manage diarrhea, indicating good awareness and practice of this effective rehydration method in Table 04.

Table 04: Distribution of the respondents ORS used drinking water (n=428)

ORS used during diarrhea (n=428)	Frequency (%)
ORS used	337 (78.7)
Not used	27 (6.3)
Other measures	64 (15)

The highest percentage (48.4%) of respondents dispose of waste in closed spaces, indicating a preference for contained waste management. This practice helps reduce environmental contamination and health hazards in figure 1.

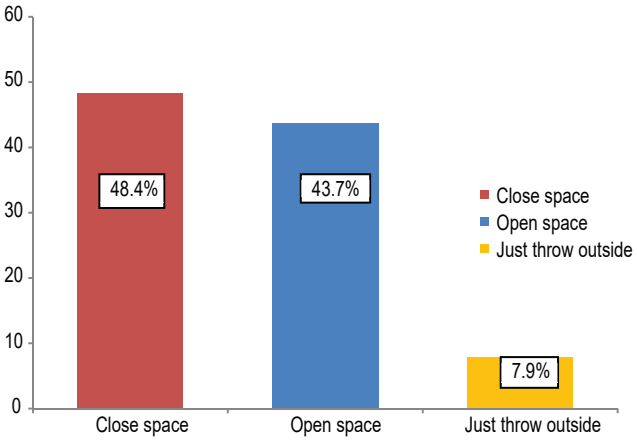

Figure 1: Distribution of the respondents' practices about disposal of garbage

While a majority of respondents 43% use some form of water purification, a notable percentage 32% still consume untreated water, which could increase the risk

of waterborne diseases. This highlights the need for awareness campaigns and better access to safe water purification methods to improve public health outcomes in figure 2.

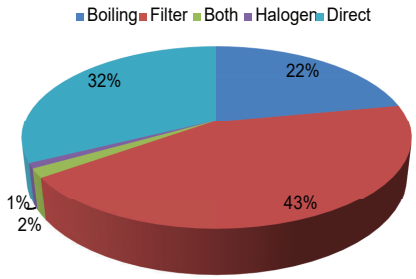

Figure 2: Distribution of the respondents by purification of drinking water

Discussion

The study found that most participants had a high level of knowledge and good hygiene practices for preventing diarrheal diseases, particularly in handwashing. This aligns with global findings that emphasize handwashing as a key intervention in reducing diarrheal disease. However, despite high awareness, an insignificant number of respondents did not use ORS during diarrhea, indicating gaps in effective management. Similar studies in Bangladesh and other low-income settings have reported challenges in ORS adoption due to lack of awareness or misconceptions. The study found that a significant number of respondents relied on deep tube wells for drinking water, which is a positive indicator of safe water access. However, most of the people drank directly from the supply water, and a small fraction used pond water, which may increase the risk of waterborne infections. Despite a significant number of respondents using sanitary latrines, a small fraction still relied on suboptimal sanitation facilities (tin shed and kacha latrines). This suggests that while sanitation infrastructure is improving, there is still a need for targeted interventions in hygiene promotion and improved waste management. Studies from other developing countries have shown that access to safe drinking water and improved sanitation can reduce diarrheal disease incidence by up to 40%. The findings of this study are consistent with similar research in Bangladesh, where improved sanitation and hygiene behaviors are key determinants in reducing diarrheal disease rates. Compared to national data, the level of hand hygiene practice in this rural setting appears relatively high. A Bangladesh Demographic and Health Survey (BDHS) report suggested that handwashing practices remain inconsistent in many rural regions, indicating possible behavioral improvements in this study area. Although a large number of respondents used ORS during diarrhea, the remaining did not use ORS or relied on other measures. Future interventions should emphasize community education programs that promote the universal use of ORS and zinc supplementation, as recommended by the WHO. Water purification practices were not universally adopted, with small number of respondents consuming untreated water. This highlights the need for further public health education on the risks of consuming unfiltered or untreated water. The findings underscore the importance of strengthening health education programs to promote universal ORS use and improved hygiene. Government and non-governmental organizations should work to increase access to improved sanitation and safe drinking water, particularly in rural areas. Future programs should also focus on behavioral change communication to reinforce safe hygiene and sanitation practices at the household level. A key strength of this study is its relatively large sample size, which enhances the generalizability of findings within the study region. However, the study used a purposive sampling method, which may introduce selection bias. Future studies using randomized sampling would help strengthen the reliability of the results.

Conclusion

The study highlights a high level of awareness and good hygiene practices among the rural adult population regarding the prevention and control of diarrheal diseases. Most respondents demonstrated satisfactory knowledge and adherence to proper hand hygiene, safe water consumption, and sanitation practices. However, gaps remain in ORS utilization during diarrhea, reliance on untreated drinking water, and the use of suboptimal sanitation facilities by a small fraction of the population. Addressing these gaps through targeted health education programs, community interventions, and improved access to safe drinking water and sanitation facilities is crucial. Strengthening behavioral change communication and promoting universal ORS and zinc supplementation use can further reduce the burden of diarrheal diseases. Future research with randomized sampling methods would enhance the generalizability of these findings and contribute to more effective public health strategies.

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Original Article

A Retrospective Observational Study of Socio-Demographic Causes of Death Due to Hanging in Sir Salimullah Medical College Hospital, Dhaka, Bangladesh

Nazmun Nahar Rojy[1], Rafayatul Haidar[2], Sharmin Rahman Linda[3], Md. Abir Hossain[4], Sejuti Saha[5]

Abstract

Background: Hanging is the most common violent asphyxial death in Bangladesh. It is a form of asphyxia by a ligature material around the neck. When the body is suspended by ligature, the body weight constricts force, and the noose moves against gravity.

Objective: To evaluate the profile and socio-demographic characteristics in the cause of death due to hanging.

Materials and Method: The Department of Forensic Medicine & Toxicology at the Sir Salimullah Medical College in Bangladesh carried out a two-year retrospective investigation of hanging deaths from January 2023 to December 2024. Police inquest findings and post-mortem reports were examined. The current study's objective was to examine the different hanging death profiles and contrast the results with previously published research.

Result: Most participants were aged 21-30, and 86 (51.5%) were female. Orna was the top choice 104 (62.3%) for ligatures, then rope 44 (26.3%) and gamcha 13 (7.8%). Neck injuries are observed in most cases;158 (94.6%) cases had a solitary ligature mark, while 2 (1.2%) had a double mark, and 7 (4.2%) had a barely visible one.

Conclusion: Suicide through hanging remains one of the critical health problems that cause death; factors that contribute to suicide include poverty, family conflict, mental illness, and unemployment. The government and non-governmental organizations should work to address this issue by focusing on stress management and providing appropriate mental health education.

Keywords: Hanging, Suicide, Autopsy

Introduction

Asphyxia is a condition where the organs and tissues are deprived of oxygen because of interference with breathing or a lack of oxygen in the air that is being breathed. In this sense, hanging is common since any object that can support body weight while suspended can be used as a ligature, such as sturdy nylon ropes or shoelaces[1]. Hanging is one of the leading causes of unnatural death and a popular suicide technique worldwide is hanging. Since death happens quickly—within minutes of the act—there is no turning back once it has been attempted[2]. The weight or a portion of the body weight acts as a constricting force when the body is suspended with a ligature around the neck, resulting in hanging, a violent asphyxial death[3]. The head's weight is sufficient to exert a constriction. In 15 seconds, a thin rope around the neck will render a person unconscious[4]. A condition when a person's entire body is suspended from above without touching the ground is referred to as "complete hanging". Partial hanging, on the other hand, only suspends a portion of the body. The position of the knot is crucial because uneven pressure on the different

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Received Date : 24 July,2024
Accepted Date : 10 August,2024

parts of the neck can result in a wide range of injuries. Because the earth is not supporting the body's weight when hanging completely, there is a far higher chance of damage than when hanging partially[5]. In this study, we have to assess the sociodemographic traits and profile in the event of a hanging death.

Materials and Methods

The 167 hanging cases that were autopsied in the mortuary of Sir Salimullah Medical College Hospital in Dhaka were included in this retrospective analysis, which was carried out between January 2023 and December 2024. 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. Microsoft Excel was used for analysis once the gathered data was collated on a master chart.

Results

Distribution of hanging cases according to age and sex, out of 167 cases of hanging, 81 (48.5%) were male, and 86 (51.5%) cases were female, thus indicating that the majority of victims were female. These data are given below in Figure 1.

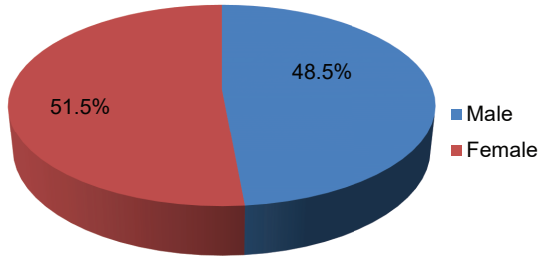

Figure 1: Distribution of participants stratified by sex.

In our observation, we found the majority of people were Muslim 151 (90.4%) whereas 16 (9.6%) were Hindu. No evidence was found in Buddhist and Christian. These are shown in figure 2.

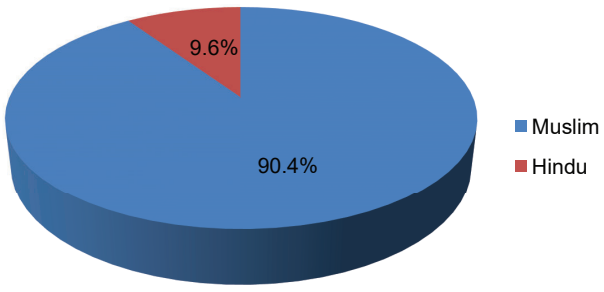

Figure 2: Religion

According to the data presented in Figure 3, 61% was married and 39% was unmarried which is presented below.

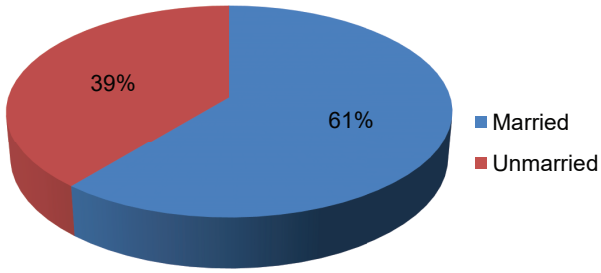

Figure 3: Marital Status

Table 1 shows the ligature mark pattern. It showed that hanging occurs most often by encircling in a single loop 158 (94.6%), and in 7 cases (4.2%) cases, the loop mark tends to be very faint. These observations shown below.

Table 1: Differences in the marks made by ligatures on the neck

Variables	Observation (n=167)
Single	158 (94.6%)
Double	2 (1.2%)
Very Faint	7 (4.2%)

According to the data presented in Table 2, A significant proportion of patients fell within the 21-30 age range, with 45% falling within this category.

Table 2: Age distribution

Variables	Age Group (n=167)
10-20	53 (31.7%)
21-30	75 (45%)
31-40	16 (9.6%)
41-50	14 (8.4%)
51-60	5 (3%)
61-70	3 (1.8%)
71-80	1 (0.60%)

In this study, maximum cases were observed among the housewives (36.70%). Minimum cases were found among the service holders (7.70%). These data were mentioned in Figure 4.

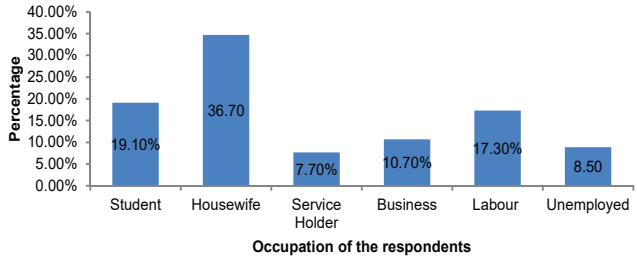

Figure 4: Occupation-wise Distribution

During observation of a variety of hangings, we found complete hanging was 72% of cases and partial hanging cases was 28%, which are mentioned in Figure 5 and given below.

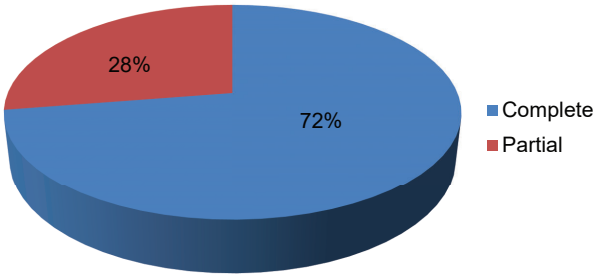

Figure 5: Type of hanging

Saliva stain mark are one of the most critical presentations for hanging cases. However, this stain mark was present in only 27% of the cases. In most cases, 73% presented no saliva stain mark. All of these are shown in Figure 6.

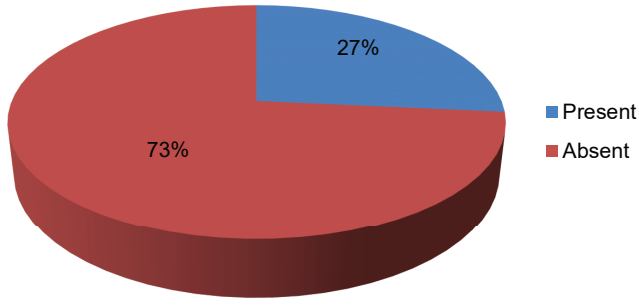

Figure 5: Saliva stain marks

According to Table 4, the most commonly used ligature material for hanging among the patients was orna accounting for 62.3% of cases, followed by rope at 26.3% and gamcha at 7.80%.

Table 4: Ligature Material during the incidence

Material	Number (N=167)
Orna	104 (62.3%)
Rope	44 (26.3%)
Gamcha	13 (7.80%)
Sharee	5 (3%)
Wire	1 (0.60%)

The prevalence of hanging cases reported in a tertiary hospital varied across Dhaka South police stations. South Keraniganj had the highest prevalence, accounting for 38 (22.7%) cases, followed by Keraniganj Model with 35 (20.9%) cases and Demra with 22 (13.1%) cases. Bongshal (6.5%), Nawabganj (3.1%), Kamrangirchor (3.5%), and Kotwali (4.1%) reported moderate cases. In contrast, areas like Kadamtoli (2.9%), Sutrapur (2.3%), Lalbag (1.2%), and Wari 0.6% had the lowest reported cases. Other regions, including Gendraria, Sympur, Sadargahat Nou Ghat, Jatrabari, and Dohar, each contributed between 1.7% and 4.1% of the total cases. These findings highlight the variation in reported cases across police station jurisdictions (Table 5).

Table 5: Prevalence of hanging in a territory hospital among the Dhaka South Police stations based on reported cases.

Police station	Prevalence rate
South Keraniganj	38 (22.7%)
Keraniganj Model	35 (20.9%)
Demra	22 (13.1%)
Bongshal	11 (6.50%)
Kotwali	7 (4.10%)
Nawabganj	15 (3.10%)
Kadamtoli	5 (2.90%)
Sutrapur	4 (2.30%)
Lalbag	2 (1.20%)
Gendraria	7 (4.10%)
Sympur	3 (1.70%)
Sadargahat Nou ghat	3 (1.70%)
Kamrangirchor	6 (3.50%)
Khilgaon	1 (0.60%)
Jatrabari	3 (1.80%)
Dohar	4 (2.40%)
Wari	1 (0.60%)

Maximum cases were observed due to Depression 57 (34.1%) followed by Familial disharmony 41 (24.5%). This data was given below on table 6.

Table 6: Causes of hanging

Cause	Number(N=167)
Familial disharmony	41 (24.5%)
Arrogance	13 (7.8%)
Poverty	31 (18.6%)
Depression	57 (34.1%)
Mental Unsoundness	12 (7.2%)
Anger	13 (7.8%)

Discussion

Every suicide is a terrible tragedy that results in the untimely death of a person and has a lasting impact on the lives of the victim's family and community[6]. It is unknown, how many people in Bangladesh hang themselves every year, but in India, where we have a close ally, there is a suicide every 5 minutes and seven suicide attempts for a total of roughly 100,00 suicide deaths every year[7]. Among the 167 people who were found to have been hanged, a small fraction of respondents were male, and the majority of the respondents were female. Among them significant number of respondents were married. When looking across all age groups, marital strife was the main cause of suicide are argument, mental despair, drug addiction, romantic disappointment, unwanted pregnancies, incurable diseases, mental instability, and a host of other issues in the family were all factors. Young individuals are more likely to commit suicide in both developed and developing countries. Motivating elements include social pressure and mental health difficulties[8]. The most common head covering in Nepal, according to research done by *Pradhan* A between January 2007 and April 2008, was rope, which was followed by shawls (31.81%), sharis (9.09%), and woolen mufflers (4.54%)[9]. The victims push themselves off the ceiling, fan, book, pipe, beam, girder, etc. after standing on a chair, table, or other object. In these situations, a lamppost, tree limb, or other outdoor fixture is frequently used as the suspension point. Using ligature materials like a belt, electric wire, scarf, tie, dressing gown cord, shoelace, curtain cord, telephone cord, shower lead, etc. is not typical in our country[10].

Conclusion

The present research focuses on the many aspects of suicidal hanging in Bangladesh, where married women make up the bulk of those who have committed suicide by hanging in a prohibited area. The primary, most common cause in this study is depression in people aged 21 to 30. Salivary dribbling, seen as an indication of antemortem hanging, was present in a negligible proportion of cases. A small number of cases involving hyoid bone or thyroid cartilage were found.

Source of funding

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

Conflict of interest

No conflicts of interest are disclosed by the author.

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Case Series

Case Studies on Thiamine Replacement Therapy: For Suspected Cardiac Beriberi in Children and Literature Review

Mahmuda Hassan[1], Kona Choudhury[2], Afsana Mukti[3] , Masuma Khan[4] , Marium Begum[5], Hamidur Rahman[6]

Abstract:

Thiamine (vitamin B_1) serves as an important cofactor in metabolism and energy production. It is related to the biosynthesis of neurotransmitters and the production of substances used in defense against oxidative stress. Lack of thiamine affects several systems of the body, predominantly the cardiovascular and nervous systems. The cardiac effect caused by thiamine deficiency is known as cardiac beriberi, also known as wet beriberi. Other than wet beriberi, dry beriberi presents with neurological symptoms. The more severe form is Shoshin beriberi with cardiac failure and lactic acidosis with cold periphery as the presenting feature. The disease is now very rare in developed countries in this era, but still present in South East Asia and developing countries including Bangladesh. Thiamine deficiency (TD) is an important public health problem because almost all of the populations in this area consume polished rice, which is the major staple food, and other primary dietary sources of thiamine are also poor. TD is frequently missed by pediatricians, with potentially fatal consequences. Herein, we present a series of cases to draw attention to cardiac beriberi. We believe that these cases will help prompt us to the importance and also a reminder of this forgotten but notable disease.

Keywords: Beriberi, Heart Failure, Thiamine Deficiency

Introduction

A water-soluble vitamin, thiamine, also known as vitamin B1, has a physiologically active form called thiamine pyrophosphate, which functions as a coenzyme to make vital glucose for energy and is needed for the metabolism of carbohydrates.[1,2] The absence of this active component is commonly denoted as beriberi or thiamine deficiency (TD). In numerous systems, including the cardiovascular system, TD makes pyruvate and some amino acids inaccessible. According to earlier research, TD has a negative long-term impact on cardiac contractility, which may eventually lead to heart failure.[3,4,5] The diagnosis of TD is frequently overlooked without any suspicion because clinically obvious TD is now extremely uncommon in affluent nations, and the majority of patients show no symptoms or indicators.[6,7] Physicians can, however, have a reasonable suspicion of heart failure when there is undernutrition and a history of polished rice consumption by the child or the nursing mother of a baby with heart failure. If treatment is not received, the consequences could be severe.

Here, we describe four cases of cardiac beriberi where prompt, effective treatment triggered a significant clinical improvement within a very short period.

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Received Date : 2 August 2024

Accepted Date : 20 September 2024

These 4 classes were taken randomly and selected from Paediatric Inpatient Department (IPD) of Ad-din Women's Medical College and Hospital.

As there are risks of death from heart involvement and morbidity from permanent psychosis, it is crucial to start thiamine replacement therapy as soon as a thiamine deficiency is identified or even suspected [8]. Since thiamine supplementation can cause symptoms to improve dramatically and quickly, it can even be employed as a diagnostic test in cases of acute heart failure or creeping peripheral neuropathy. For those with thiamine deficiency who have not developed Korsakoff syndrome, the prognosis is promising. Psychosis in Wernicke-Korsakoff syndrome may be everlasting and not get better for months.[9] Clinical symptoms and blood thiamine diphosphate (TDP) levels following therapy are confirmatory for diagnosis in order to confirm TD to do the blood TDP concentrations.

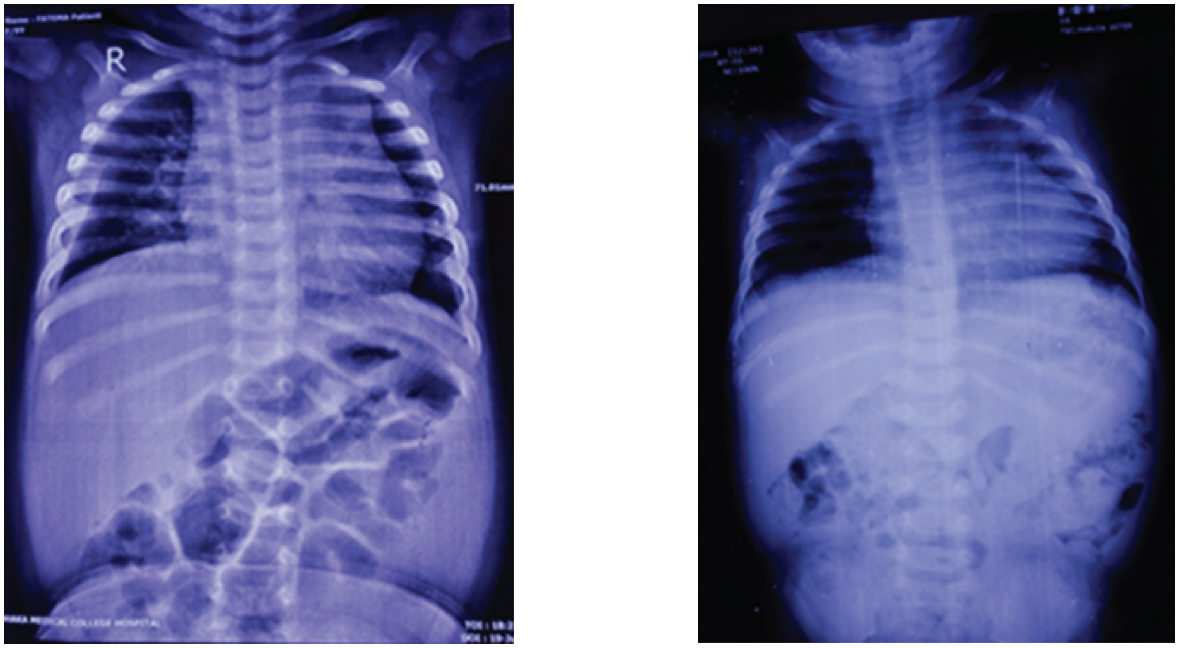
Case Series

Case 1: A 9-month-old female adopted child who was delivered normally had a history of respiratory distress, and presented with fast breathing, respiratory rate of 66 breaths per minute, severe chest indrawing, and flaring of the ala nasi, she was centrally cyanosed on arrival at the hospital, with a SpO2 of 83% in room air, cyanosis dissipated after receiving oxygen 2 liters per minute and succeeding development of SpO2 was> 95%. Blood pressure was 70/30 mm Hg, the pulse rate was 169 beats per minute, and a gallop was on auscultation. Her temperature was normal, and she had no history of fever. She also had feeding difficulty with vomiting. No significant past illness and immunized as per EPI schedule. She was adopted on her 3rd. day of life and fed with diluted formula milk for up to 5 months. After 5 months, rice gruel was given along with diluted milk till hospital admission, with occasional history of having rice-based family food without any protein and vegetable intake.

When examined, the baby was afebrile, severely pale, and had tender hepatomegaly. Also had fast breathing and chest indrawing. Her weight for height was on the 50th centile, her weight was 7 kg (below the 3rd centile), and her length was 65 cm (at the 3rd centile). The infant received the first dosage of furosemide and was kept on nothing orally while receiving restricted intravenous fluid.

The patient was diagnosed provisionally with severe anemia, heart failure, feeding mismanagement, failure to thrive, and presumed sepsis.

CBC showed severe iron deficiency anemia with Hb% 6.3gm/dl, and PBF showed microcytic hypochromic anemia with anisopoikilocytosis with few target cells. Blood C/S subsequently showed no growth, and portable chest X-ray revealed cardiomegaly. It was



Before **After**

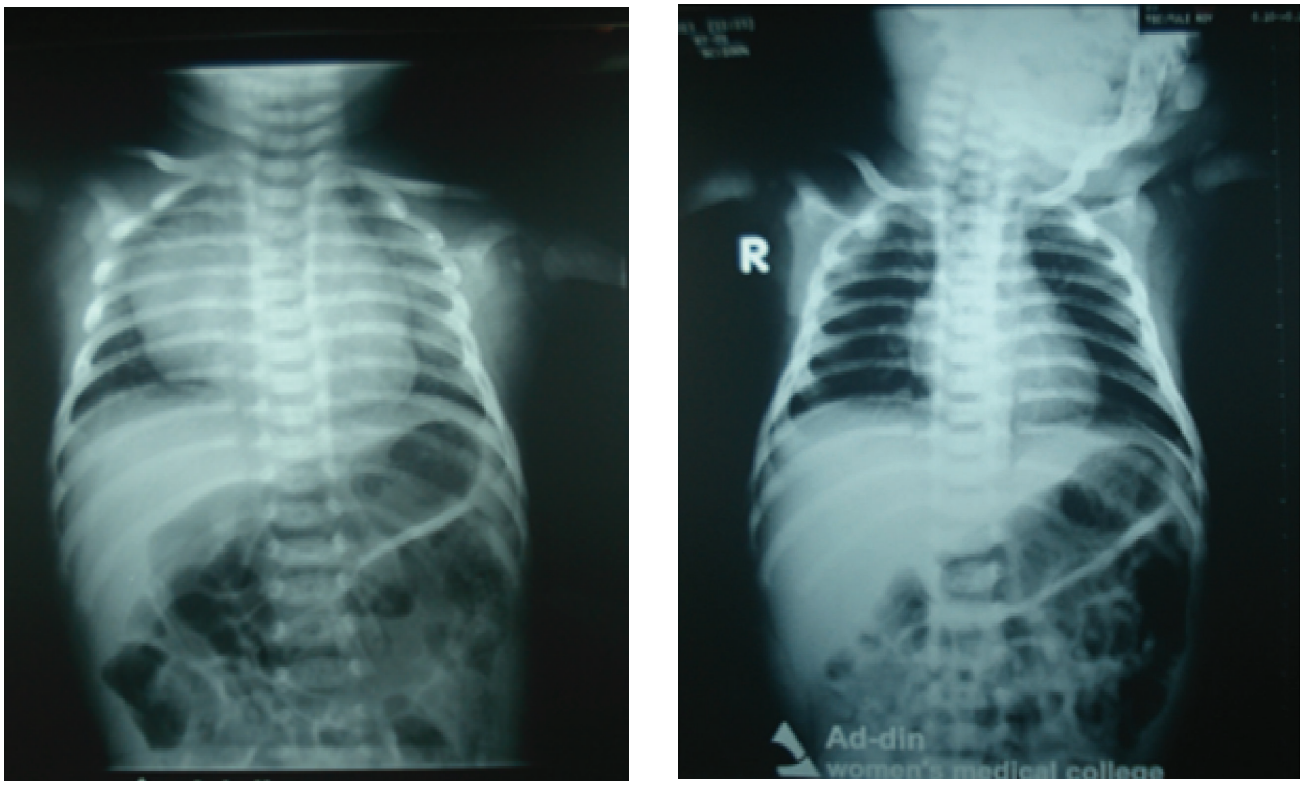
Figure 1: Chest X-ray before and after treatment (Case 1)

planned to perform an ECG and echocardiogram. Within an hour of arriving at the hospital, injectable thiamine was given at a dose of 25 mg twice daily without waiting for further investigations.

According to hospital protocol, antibiotics were started as the bacterial infection was yet to be stopped. Packed Red Blood Cell (PRBC) transfused for anemia after 24 hours of admission. The suspected baby's condition improved surprisingly after getting two doses of injectable thiamine and one dosage of furosemide within eight hours.There was no tachypnea or tachycardia, and the liver size was reduced by 2 cm.

The results of the liver function tests, blood electrolytes, and serum calcium were all within satisfactory levels. The antibiotic was advised to stop on the fourth day after getting blood and urine culture report and kept the patient in the hospital for seven days with regular bedside follow-up for any deterioration clinically or improvement. We continued injectable thiamine, multivitamins, and extra iron. On the seventh day of the hospital stay, a second chest X-ray revealed normal lungs with normal cardiac shadow. The infant was released with dietary advice from a nutritionist for complementary feed.

Case 2: A 1½ month baby belonging to a middle-class family was admitted to our emergency with the complaints of sudden reluctance to feed, hoarseness of crying for 3 days, and severe respiratory distress for 1 day. There was no history of fever, cough, cyanosis, runny nose, or aspiration of milk. The baby was delivered by caesarian section at term due to placenta previa. The mother was on regular antenatal checkups & was transfused with 3 units of blood at 32 weeks of gestation due to severe anemia. After the birth of the baby, the mother took only iron & calcium tablets. Mother including the whole family had a regular habit of having polished milled rice & avoidance of leafy vegetables during postpartum period in the fear of gaseous abdominal distension of the baby. On physical examination, the baby was dyspnoic, crying in a hoarse tone, there was tachycardia, tachypnea, hepatomegaly and laterally shifted apex beat. There was no edema or cyanosis. Immediate chest X-ray showed cardiomegaly. A combination of unexplained heart failure and dysphonia led us to suspect infantile beriberi so 12.5 mg of intravenous thiamin was administered. Within 12 hours, features of heart failure started receding and the cry was also improved.



Day 1 **Day 7**

Figure 2: Chest X-ray before and after treatment (Case 2)

Case 3: A 4-month-old baby, was admitted with the complaints of acute watery diarrhoea for 4 days & aphonia for 2 days. There was no history of cough, vomiting, respiratory distress, or fever. The baby was fed with breast milk along with diluted formula milk up to one month of age. Since then rice powder had been started mixed with diluted milk & misery (locally available sugar crystals). Feeding history of mother revealed an intake of highly polished milled rice. During postpartum period, the mother did not take any vitamin supplementation. On examination, the baby had oedematous and malnutrition. So, in addition to other measures 12.5mg of injection. Thiamine was administered I/V and in next 24 hours, baby cried with a loud voice.

Case 4: A 3-month-old baby boy, only issue of his parents, presented with failure to thrive since one month of age with sudden onset of aphonia for 3 days. He was delivered at home by Normal Vaginal Delivery (NVD) and his birth weight was average. He was being exclusively breastfed but his growth was not satisfactory. His mother's staple food was polished milled rice. They belong to a poor family. His mother was only 16 years of age and was also suffering from malnutrition. On examination along with growth failure, also had angular stomatitis and cheilosis. This suspected baby also received injection thiamin intravenously and his aphonia improved within 72 hours.

Discussion

Despite being extremely uncommon in the modern period, particularly in affluent nations, cardiac beriberi has been documented on numerous occasions throughout history.[6] Numerous studies have underlined the necessity of having a clinical suspicion of cardiac beriberi in patients who appear with heart failure since, in these situations, proper thiamine replacement can quickly improve cardiac function and avoid disastrous outcomes. Following admission, our patients received thiamine injections along with other medicines as needed and intravenous antibiotics following departmental practice, and significant clinical improvement was noted.

Digoxin was not administered because every patient recovered quickly. At the moment, the following three criteria determine the diagnosis of this illness: 1) A history of nutritional insufficiency and clinical symptoms associated with heart failure. 2) Exclusion of other etiologic types of heart disease. 3) Therapeutic response to thiamine administration.[1] Even with the support of sophisticated, contemporary cardiac imaging modalities like echocardiography and cardiac magnetic resonance (CMR), they are not available in most situations at peripheral hospitals. In these situations, the diagnosis of cardiac beriberi is commonly missed without suspicion. However, the echocardiographic findings for cardiac beriberi are very similar to those of other forms of dilated cardiomyopathy, i.e., a reduction in Left Ventricle (LV) systolic function and Left Ventricle (LV) enlargement with or without valvular regurgitation. As such, we cannot establish a diagnosis of cardiac beriberi based exclusively on echocardiography.[10, 11,12] However, myocardial edema, apart from LV systolic dysfunction, is not a specific finding for cardiac beriberi. Besides this, myocardial edema may not constantly be present in cardiac beriberi. We did not place an order for laboratory confirmation of TD as mentioned above. The diagnosis of beriberi can be supported and confirmed by measuring blood levels of thiamine pyruvate, urine excretion of thiamine, and its metabolites and these investigations are not readily available in all hospitals. The diagnosis can also be confirmed by the shortage of any of these three criteria.[13] However, determining these compounds takes a lot of time and money, and it might delay diagnosis and treatment, which could be fatal. Because of these factors, thiamine replacement is thought to be the most practical, and treatment if given in such a critical baby without thiamine deficiency would have any negative impacts on health. It is reasonable to assume that TD caused the heart failure if the patient reacts to this experiential thiamine replacement, as we have observed in our cases.

Conclusion

Due to its vague symptoms and indicators of cardiac beriberi secondary to TD, it is difficult to diagnose. As a result, a combination of the clinician's suspicion, thorough history and physical examinations can save lives with empirical thiamine replacement without doing any harm to the patients along with the other treatment protocols of the hospital.

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Short Communication

Chikungunya's Lingering Pain: Arthritis in the Aftermath

Richmond Ronald Gomes[1]

Introduction

The term "Chikungunya" originates from the Makonde language, translating to "that which bends up," which reflects characteristic posture of patients exhibiting severe symptoms.[1] The fever is locally also named 'Langra Jor'.

Chikungunya Fever (CHIKF) is caused by an RNA virus (CHIKV) that is single-stranded belonging to the genus Alphavirus belonging to the Togaviridae family, comprising some viruses transmitted (mostly) by arthropods.[2] Only 5% of infected individuals are asymptomatic[3]. The virus was first isolated in 1952-1953 from both men and mosquitoes during an epidemic of fever that was considered clinically indistinguishable from dengue fever in Tanzania[4]. It is a single-stranded RNA virus, heat-labile, and sensitive to temperatures above 58^0 C.

Chikungunya virus is transmitted by Aedes mosquitoes (*Ae. Aegypti & Ae. Albopictus*) which breed in clean water collections in containers, tanks, disposables, and junk material in domestic and peri-domestic situations besides natural habitats like tree holes, plantations etc[5]. Transmission of CHIKV is associated with rainfall, temperature, and other climatic variables, similar to that of dengue mosquitoes. In recent years an increase in CHIKV during monsoon and post-monsoon seasons has been reported due to a varied vector population associating rainfall and its lifespan affected by temperature and humidity. In Bangladesh, *Ae. Aegypti* remain the primary carrier/main vector to transmit CHIKV principally being day biters. The incubation period (time from infection to illness) can be 2-12 days but is usually 3-7 days.[5] Acute Chikungunya fever typically lasts a few days to a couple of weeks, but some patients have prolonged fatigue lasting several weeks. Additionally, most patients have reported incapacitating joint pain, or arthritis which may last for weeks or months. The prolonged joint pain associated with CHIKV is not typical of dengue. Joint pain is often severe, and most often involves the metacarpal-phalangeal and interphalangeal joints of the hands, the wrists, the ankles, and the metatarsal-phalangeal joints of the feet. Less commonly involved but described joints include the shoulders, elbows, hips, knees, and inter-vertebral joints.

Maternal-to-child transmission has also been reported, with up to 50% of neonates acquiring infection during childbirth if born within 5 days of maternal infection. Musculoskeletal manifestations are less prominent in newborns, with CHIKF being more notable for fevers, rash, cytopenias, hepatitis, and/or encephalitis.[5]

Chikungunya in Bangladesh[5]

Bangladesh experienced its first reported outbreak in 2008 during an outbreak in the northwest of the country in two villages near the Indian border. Despite several subsequent isolated outbreaks, culminating in an enormous nationwide epidemic in 2017, very little is known about the burden or dynamics of Chikungunya within the country and the risk factors for infection. A significant outbreak of Chikungunya virus (CHIKV) took place in Bangladesh between April and September 2017, putting more than two million individuals at risk of infection. Between April 1, 2017, when the outbreak began, and September 7, 2017, the Ministry of Health, Govt. of Bangladesh documented 984 cases confirmed through real-time PCR testing, alongside over 13,176 clinically confirmed cases across 17 out of 64 districts.

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Received Date : 2 August,2024
Accepted Date : 30 August,2024

Criteria for the Identification of Chikungunya Infection[5]

Clinical criteria:

- acute onset of fever >38.5°C
- severe arthralgia/arthritis not explained by other medical conditions

Epidemiological criteria:

- Residing or having visited epidemic areas
- having reported transmission within 15 days prior to the onset of symptoms

Laboratory Criteria:

At least one of the following tests in the acute phase:

- Virus isolation by Cell Culture
- Presence of viral RNA by real-time RT-PCR (Within 5 days of onset of illness)
- Presence of viral-specific IgM antibody in a single serum sample collected within 5 to 28 days of onset of Fever
- Four-fold Rise of IgG antibody in samples collected at least three weeks apart (1st sample after 7 days)

Clinical Presentation[5]

Table 1: Clinical features of Chikungunya fever

Common	Infrequent	Rare in adults but common in children
Fever	Stomatitis	Photophobia
Arthritis/arthralgia	Oral ulcer	Retro orbital pain
Backache	Exfoliative dermatitis	Vomiting/diarrhoea
Headache	Photosensitivity	Mental confusion
Rash	Hyperpigmentation	Signs of meningeal irritation

Table 2: Clinical and laboratory features of chikungunya virus infections compared with dengue virus infections[5]

Trait	Chikungunya	Dengue
Fever (>38.5°C)	+++	++
Arthralgia	+++	+/-
Arthritis	+	-
Headache	++	++
Rash	++	+
Myalgia	+	++
Hemorrhage	+/-	++
Shock	-	+
Lymphopenia	+++	++
Neutropenia	+	+
Thrombocytopenia	+	+++
Hemoconcentration	-	++

Clinical course and outcome[5]

1. Acute symptoms typically resolve within 7–10 days with overall reported case fatality rate of <1% based on epidemics in the Indian Ocean region and the Americas. Nonetheless, case fatality rate is elevated in newborns, older adults, and individuals with preexisting cardiovascular & pulmonary conditions.
2. Some patients may experience a relapse of rheumatologic symptoms, such as polyarthralgia, polyarthritis, and tenosynovitis, several months after the acute illness.
3. In varying proportions of patients, joint pain can persist for months to years.
4. Rare complications associated with the disease include uveitis, retinitis, myocarditis, hepatitis, nephritis, bullous skin lesions, hemorrhage, meningoencephalitis, myelitis, Guillain-Barré syndrome, and cranial nerve palsies.

Vaccination[5]

A Chikungunya vaccine is designed to confer acquired immunity against the Chikungunya virus. The most frequently reported side effects associated with this vaccine include headache, fatigue, muscle pain, joint pain, fever, nausea, and tenderness at the site of injection. The first Chikungunya vaccine was approved for medical use in the United States in November 2023.

Prevention[5]

Although an approved vaccine exists, the most effective means of prevention are protection against contact with disease-carrying mosquitoes and controlling mosquito populations by limiting their habitat. Mosquito control focuses on eliminating the standing water where mosquitos lay eggs and develop as larvae; if elimination of the standing water is not possible, insecticides or biological control agents can be added. Methods of

protection against contact with mosquitos include using insect repellents with substances such as DEET, icaridin, PMD (p-menthane-3,8-diol, a substance derived from the lemon eucalyptus tree), or ethyl butylacetyl aminopropionate (IR3535). However, increasing insecticide resistance presents a challenge to chemical control methods.

Wearing bite-proof long sleeves and trousers also offers protection, and garments can be treated with pyrethroids, a class of insecticides that often have repellent properties. Vaporized pyrethroids (for example in mosquito coils) are also insect repellents. As infected mosquitoes often feed and rest inside homes, securing screens on windows and doors will help to keep mosquitoes out of the house. In the case of the day-active *Ae. Aegypti* and *Ae. Albopictus*, however, this will have only a limited effect, since many contacts between mosquitoes and humans occur outdoors.

Treatment[5]

Currently, there is no specific treatment available for Chikungunya. Supportive care is recommended, and symptomatic treatment of fever and joint swelling includes the use of nonsteroidal anti-inflammatory drugs such as naproxen, non-aspirin analgesics such as paracetamol (acetaminophen), and fluids. Aspirin is not recommended due to the increased risk of bleeding. Despite anti-inflammatory effects, corticosteroids are not recommended during the acute phase of the disease as they may cause immunosuppression and worsen infection.

Passive immunotherapy has potential benefits in the treatment of Chikungunya. Studies in animals using passive immunotherapy have been effective, and clinical studies using passive immunotherapy in those particularly vulnerable to severe infection are currently in progress. Passive immunotherapy involves the administration of anti-CHIKV hyperimmune human intravenous antibodies (immunoglobulins) to those exposed to a high risk of Chikungunya infection. No antiviral treatment for Chikungunya virus is currently available, though testing has shown several medications to be effective in vitro.

Chronic Chikungunya Arthritis/Post Chikungunya arthritis

Arthritis/arthralgia is a principal feature of CHIKF caused by this virus, with high risk of progression to functional and quality of life sequelae.

The prevalence of chronic arthritis after acute CHIKV infection has been reported at approximately 14%. Factors such as an age of more than 45 years, high viral load (>109/mL) during the acute phase and severe immunologic response in post-viremic phase are predictors of development of chronic symptoms.

Arthritis/arthralgia is a principal feature of CHIKF. Many patients recover within several weeks. When rheumatic disease persists for more than 12 weeks, we refer to these symptoms as chronic Chikungunya arthritis (CCA). Arthritic manifestations can last for weeks, months, or even years. Rodriguez-Morales and colleagues retrospectively studied 283 patients from the 2015 epidemic in Risaralda Department, Colombia. At 26 weeks post-infection, 53.7% of the patients reported chronic musculoskeletal symptoms, including 49.5% with morning stiffness, 40.6% with joint swelling, and 16.6% with joint erythema[6]. Another large observational study from Kerala, India, found that 57% of patients had chronic polyarthralgias, 22% chronic polyarthritis, and 19.5% chronic tenosynovitis 15 months after CHIKF[7].

The classical pattern of arthritis involves the small to medium-sized joints in a peripheral and symmetric distribution. The pattern can resemble Rheumatoid Arthritis (RA), but most patients have negative tests for rheumatoid factor and anti-cyclic citrullinated peptide antibodies[8]. Patients with CCA often meet diagnostic and/or clinical criteria for RA or Spondyloarthritis[9]. The distinguishing clinical feature is a previous history of acute CHIKF, with laboratory confirmation of serum positivity for IgM and/or IgG anti-CHIK antibodies.

During acute CHIK infection, serum cytokines IL-1Ra, IL-1 β, IL-6, IL-7, IL-8, IL-12, IL-15, and IFN-α increase, while RANTES (CCL5) decreases [10,11]. With the transition to CCA, elevated levels of IL-6, GM-CSF, and IL-17 become predominant[11]. The IL-17 signature in particular may drive chronic joint inflammation, stimulating the upregulation of other pro-inflammatory cytokines, including IL-1, IL-6, and TNF-α, matrix metallo-proteinases, and RANK-RANKL, leading to osteoclastogenesis and bone erosions[12]. Alphavirus infection of osteoblasts has been shown to perturb the RANKL-osteoprotegerin ratio, contributing to bone loss. This imbalance may also provide a mechanism for joint erosions in chronic disease[13].

CHIKV primarily infects human epithelial and endothelial cells, fibroblasts, and macrophages. Replication has not

been observed in lymphocytes, monocytes, or monocyte-derived dendritic cells[14]. Viral tropism to the highly vascularized synovial tissues of the joints may be responsible for the prominence of arthritis following acute infection. Whether CHIKV persists in synovial tissue during the chronic phase remains unclear, however, and there is an ongoing debate about whether CCA arises secondary to immunological dysregulation or is due to persistent alphavirus infection of the synovial tissue.

The international literature reports variable frequencies of RF and anti-CCP positivity, reporting between 12% and 43% of positivity RF in India, and between 30% and 50% for RF/anti-CCP according to French series, probably indicating a more severe clinical profile in some of these groups, and with a higher risk of erosion. The identification of a low prevalence IL-17 elevation supports the idea of a less severe clinical profile and possibly an improved prognosis in the long term. In terms of other cytokines profile, the percentage of patients with detectable IL-6 was significant in patients (65%).

Diagnosis of Chronic Chikungunya Arthritis (CCA)

The diagnosis of Chikungunya (CHIK) relies on epidemiological data, distinctive clinical features, the infection's progression, and laboratory confirmation. Many patients either reside in or have recently traveled to regions where Aedes mosquito transmission is endemic. Laboratory testing varies depending on the infection stage. During the acute phase, CHIK viremia typically lasts for 5–7 days, during which serum RT-PCR can provide a definitive diagnosis. Anti-CHIKV IgM antibodies usually appear within 3–8 days and remain detectable for 1–3 months, while IgG antibodies can be identified at 4–10 days and may persist for months to years[4].

Patients with chronic Chikungunya arthritis (CCA) experience debilitating joint symptoms, which can range from morning stiffness and arthralgia to pronounced inflammatory synovitis. A typical pattern involves peripheral involvement of small and medium joints, although mono-arthritis and oligo-arthritis may also occur. In some patients, CCA presents clinically as an RA "mimic," but most patients have negative tests for rheumatoid factor and anti-cyclic citrullinated peptide antibodies[8]. Patients with CCA often meet diagnostic and/or clinical criteria for RA or Spondyloarthritis[9]. The distinguishing clinical feature is a previous history of acute CHIKF, with laboratory confirmation of serum positivity for IgM and/or IgG anti-CHIK antibodies.

Radiographic imaging of affected joints may initially appear normal, especially in the early stages of the disease; however, some patients may later develop bone erosions. Magnetic resonance imaging (MRI) is more sensitive for detecting inflammatory changes and can reveal synovial thickening, bone marrow edema, effusions, and/or tenosynovitis[8].

Treatment of Chronic Chikungunya Arthritis (CCA)

Guidelines for the management of CCA emphasize symptomatic pain control with acetaminophen/paracetamol, codeine, and/or neuropathic medications such as gabapentin. Adjunctive treatment includes physical therapy, thermotherapy, and/or cryotherapy[15]. These approaches can relieve pain and improve function, but are not disease-modifying.

Corticosteroid and non-steroidal anti-inflammatory drugs (NSAIDs)

In an uncontrolled case series conducted during the 2005–2006 Indian Ocean pandemic, short-term corticosteroid therapy was found to alleviate arthritis and tenosynovitis while reducing disability in patients with chronic Chikungunya arthritis (CCA)[16]. Corticosteroid treatment led to greater pain relief and patient satisfaction compared to paracetamol, NSAIDs, medicinal herbs, and physical exercise[17]. Despite positive results, long-term use of corticosteroids is not advised due to well-known risks of infection, cataracts, glaucoma, hyperglycemia and diabetes mellitus, and osteopenia/osteoporosis associated with chronic corticosteroid use.

Chloroquine and Hydroxychloroquine

An open-label pilot study investigating chloroquine (CQ) treatment for chronic Chikungunya arthritis (CCA) in South Africa demonstrated improvements in both patient and physician assessments of disease activity, although it is important to note that this trial was not blinded. Brito and colleagues have recommended hydroxychloroquine (HCQ) at a daily dose of 6 mg/kg as the first-line treatment for CCA, potentially as part of a treatment regimen that could escalate to include triple therapy with sulfasalazine (SSZ) and methotrexate (MTX)[19]. However, the majority of current evidence indicates that antimalarials like CQ and HCQ are generally ineffective for treating CCA.

Sulfasalazine

The Ravindran and Alias trial included SSZ 1000 mg daily in combination with HCQ and MTX as part of triple therapy, compared to HCQ[20]. Although the combination therapy demonstrated greater efficacy, the specific contribution of SSZ apart from MTX could not be determined. Overall, there is limited evidence supporting the effectiveness of SSZ as a monotherapy for chronic Chikungunya arthritis (CCA), though it may prove beneficial when used in combination with other medications such as MTX.

Methotrexate

In the trial conducted by Ravindran and Alias, the combination therapy regimen that included methotrexate (MTX) at a weekly dose of 15 mg, along with sulfasalazine (SSZ) at 1000 mg daily and hydroxychloroquine (HCQ) at 400 mg daily, was found to be more effective than HCQ alone. At 24 weeks, the Disease Activity Score 28 using the erythrocyte sedimentation rate (DAS28-ESR) was below 3.2 for 84% of patients in the combination group, compared to only 14% in the HCQ group. Both groups received prednisolone at a daily dose of 7.5 mg, which was tapered off over 6 weeks [20].

Additionally, in another trial by Ganu and Ganu, patients who did not respond adequately to the combination of SSZ and HCQ were switched to treatment with MTX at doses of 15–20 mg weekly compared to a placebo. The MTX group achieved a superior clinical response versus SSZ/HCQ (71.4% versus 12.5%)[21].

Amaral and colleagues conducted a study involving 48 patients with chronic Chikungunya arthritis (CCA) who were treated with open-label methotrexate (MTX), starting at a weekly dose of 7.5 mg, with adjustments for persistent symptoms after 4 weeks. The average final dose of MTX was 9.2 ± 3.2 mg per week. Nine patients (18%) received MTX in combination with prednisone at a mean daily dose of 6.1 ± 2.2 mg. Additionally, two patients were treated with HCQ at 400 mg daily alongside MTX, while one patient also received sulfasalazine (SSZ) at 1000 mg daily. At the initial visit, the average pain score measured by a visual analog scale was 7.7 ± 2.0. By the 4-week and 8-week marks, the mean pain scores had decreased to 3.0 and 2.6, respectively[22].

Overall, MTX has shown potential as a treatment for CCA; however, previous trials either involved combinations with HCQ and SSZ or were unblinded. Further randomized trials are necessary to assess the efficacy of MTX monotherapy.

Biologics

To date, no human trials have been performed to assess the efficacy of biologic therapies utilizing monoclonal antibodies for the treatment of chronic Chikungunya arthritis (CCA). Bouquillard and Combe treated patients with acute CHIKF followed by the diagnosis of RA (not categorized as CCA) with TNF-α inhibitors. These patients had been refractory to initial therapy with MTX. 6 out of 6 patients had a good clinical response (four with etanercept, two with adalimumab)[23]. The majority of the patients had been diagnosed with seronegative RA, which was not distinguished from CCA.

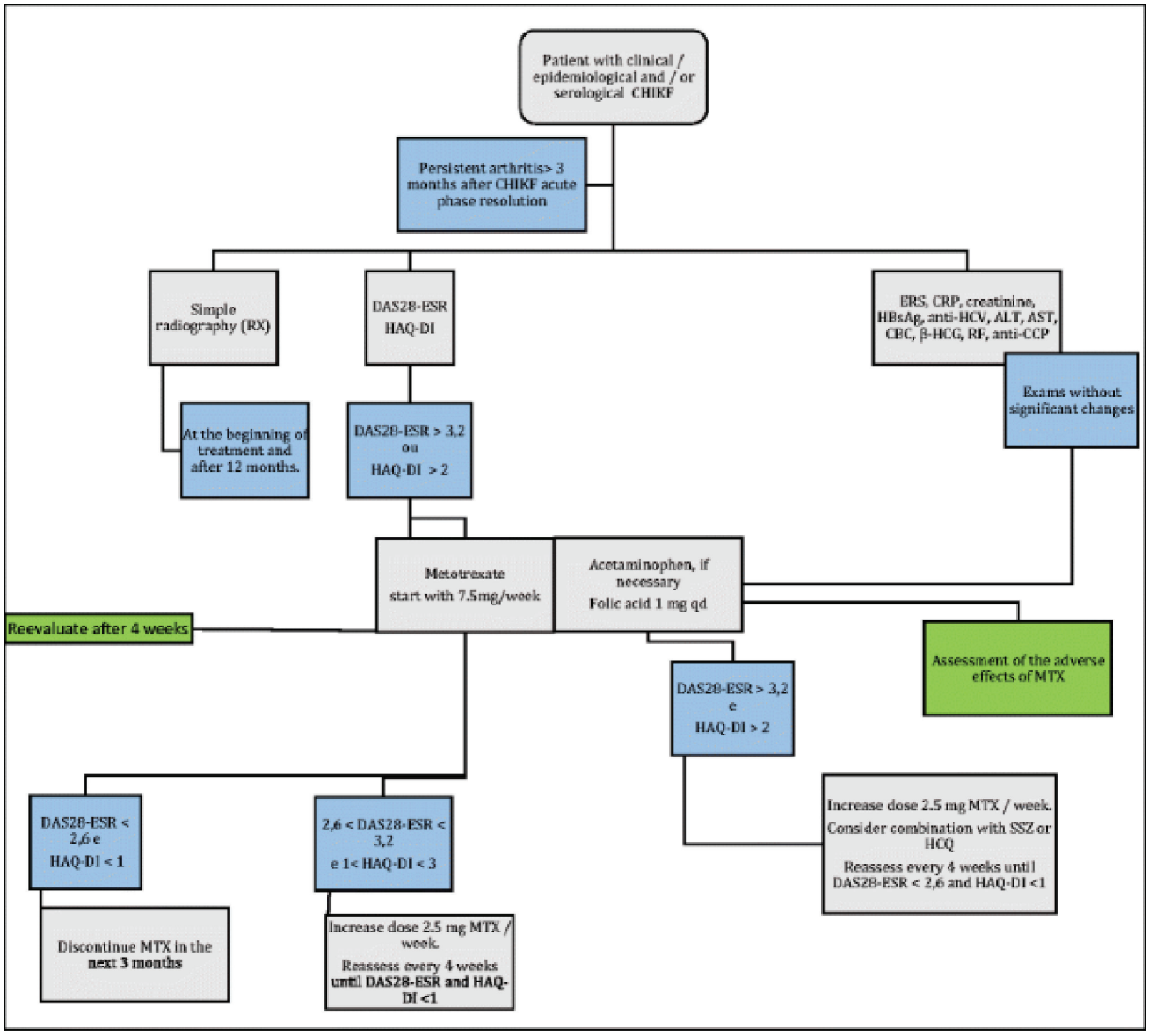
Treatment of CHIKV acutely-infected mice with the anti-CTLA-4 monoclonal antibody abatacept showed decreased T cell infiltration of joint tissues without affecting viral replication[24]. There is currently no data for its use in humans nor for its use in treating CCA.

Novel agents

Pentosan polysulfide is an innovative glycosaminoglycan-like molecule designed for the treatment of alphavirus infections. In experiments with CHIKV-infected mice, treatment with pentosan polysulfide led to a reduction in cartilage thinning and immune cell infiltration in joints25. Intra-articular levels of the pro-inflammatory cytokines IL-6, IL-9, CCL2, and G-CSF were decreased, and levels of the anti-inflammatory IL-10 were increased through unclear mechanisms[26].

While it was initially developed for the treatment of acute Chikungunya infection, it is uncertain whether pentosan polysulfide could be effective in preventing joint erosions in patients with Chronic Chikungunya Arthritis (CCA).

Fingolimod, a sphingosine 1-phosphate receptor agonist, was developed for treating multiple sclerosis. In studies involving CHIKV-infected mice, fingolimod treatment resulted in decreased migration of CD4+ T cells into the joints without affecting viral replication[27]. Although the potential of fingolimod for treating CCA has yet to be established, the reduction in T cell migration into the joints could be advantageous.



Proposal treatment of CHIK arthritis using methotrexate. DAS28-ESR Disease Activity Score 28-Erythrocyte Sedimentation Rate, HAQ-DI Health Assessment Questionnaire Disability Index, CBC complete blood count, SSZ sulfasalazine, HCQ hydroxychloroquine, RF rheumatoid factor, ALT alanine aminotransferase, AST aspartate aminotransferase, CHIKF chikungunya.[28]

Conclusion

Chronic Chikungunya arthritis (CCA) is an emerging, chronic, and debilitating rheumatological syndrome that can persist for weeks, months, or even years following an acute Chikungunya fever (CHIKF) episode.

With the global spread of the Chikungunya virus (CHIKV) in recent decades, an increasing number of patients, particularly in developing countries, have developed or are at risk of this chronic and disabling condition. The pathophysiology of CCA remains unclear, although the prevailing evidence suggests that the syndrome may arise from a post-viral autoimmune process that occurs after viral clearance.

Currently, there is limited clinical trial evidence supporting the use of disease-modifying therapies for patients with CCA. Most of the previous trials have been open-label or of questionable quality, highlighting the need for more rigorous research to better understand and treat this condition.

Empiric treatment options, including corticosteroids, NSAIDs, antimalarials, and sulfasalazine (SSZ), may be considered for managing chronic Chikungunya arthritis

(CCA). However, due to the similarities between CCA and Rheumatoid Arthritis (RA), we believe that further evaluation of methotrexate (MTX) as a treatment option is warranted. Additionally, as research progresses, new therapies, including biologics and novel agents like pentosan polysulfate and fingolimod, may become viable treatment alternatives for patients with CCA.

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Review Article

The Risks of Forceful Feeding: Lentil Soup Aspiration and Its Association to Hypersensitivity Pneumonitis (HP) in Weaning Young Children

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Abstract

Forceful feeding practices, especially during the weaning period, are prevalent in South Asian countries, such as Bangladesh, where lentil soup is commonly introduced to young children. However, this practice can lead to accidental aspiration of food, resulting in hypersensitivity pneumonitis (HP), an immune-mediated inflammatory lung disease. This article explores the association between lentil soup aspiration due to forceful feeding and HP in pediatric patients. The pathophysiology of HP involves immune complex-mediated (Type III) and delayed-type hypersensitivity (Type IV) reactions, triggering inflammatory responses in the lungs, which may lead to chronic inflammation and fibrosis. Case studies reveal that male infants are particularly vulnerable, as their anatomical characteristics increase the likelihood of retaining aspirated particles in the lungs, which can result in granuloma formation and fibrotic lesions. Clinical features of aspiration pneumonia include persistent cough, fever, and dyspnea. Investigations such as chest radiographs, high-resolution computed tomography, and bronchoalveolar lavage are essential for diagnosis, revealing typical radiological patterns and granulomatous inflammation. Treatment includes corticosteroids, proton pump inhibitors, and prokinetic agents, along with preventive strategies focusing on safe feeding practices. Educating caregivers about proper feeding techniques is crucial in preventing aspiration pneumonia and ensuring long-term respiratory health for children.

Keywords: Hypersensitivity Pneumonitis, Aspiration, Granuloma Formation, Chronic Inflammation, Fibrosis

Introduction

Forceful feeding to young children, especially during the period of weaning, is a common practice in our country. Hypersensitivity Pneumonitis (HP) is an inflammatory lung disease triggered by organic particles, which, with repeated exposure to chronic inflammation, fibrosis, and other respiratory complications in pediatric patients [1,2,3]. This condition is relevant in regions like Bangladesh, India, Pakistan, and other countries in Southeast Asia. This article explained the association between lentil soup aspiration due to forceful feeding and HP in young children.

In South Asia, particularly in Bangladesh, lentil soup is widely introduced during weaning. Mothers and near relatives often resort to forceful feeding methods using manual and bottle feeding, where children are restrained, and their mouths forcibly opened, which can lead to accidental aspiration and the combined effects of gastroesophageal reflux[4]. Studies indicate that such occult aspiration due to force-feeding practices can initiate persistent inflammatory responses in the lungs, potentially resulting in fibrosis in certain cases[5,6].

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Received Date: 20 July, 2024

Accepted Date: 23 August, 2024

It's found that male infants are particularly vulnerable to this form of HP due to anatomical factors such as increased airway resistance, which may facilitate the retention of antigens in the respiratory tract, thereby leading to chronic inflammation and granuloma formation, cellular infiltrates, leading to fibrotic lung lesions characteristic of chronic HP[7,8,9].

Pathophysiology of HP

HP represents a complex immune-mediated inflammatory response that primarily affects the lungs. HP's immunopathogenesis mainly involves immune complex-mediated hypersensitivity (Type III) and delayed-type hypersensitivity (Type IV) reactions[10]. When lentil soup is aspirated into the lower respiratory tract during forceful feeding, lentil proteins and other plant antigens enter the alveoli and bronchioles. These foreign antigens are recognized as non-self by the immune system, triggering a cascade of immune responses[11,12,13].

In immune complex-mediated hypersensitivity (III), inhaled lentil proteins bind with antibodies, typically IgG, forming immune complexes that deposit within the lung parenchyma. This complex deposition activates the complement system, leading to a release of inflammatory mediators, such as cytokines and chemokines, which attract neutrophils and other inflammatory cells into the alveolar spaces[14,15]. If antigen exposure persists, this acute inflammatory process can evolve into chronic inflammation.

The structure of lentils, particularly their cellulose-rich shell, with repeated exposure, can intensify this reaction to delayed-type hypersensitivity (IV). Here, antigen-presenting cells process lentil proteins and present them to T-helper cells, which activate macrophages and lead to granuloma formation. The cellulose acts as a granuloma-inducing substance, resulting in the formation of multiple patches or nodular lesions throughout the lungs. Chronic inflammation in response to these antigens can further result in fibrotic changes within the alveolar walls and bronchioles, creating a restrictive lung pattern, compromised gas exchange, and progressive respiratory dysfunction[16,17].

Histologically, these nodules are characterized by granulomas surrounding the small bronchi or bronchioles, containing acute and chronic inflammatory cells with accompanying fibrotic tissue. This fibrosis progressively disrupts normal lung architecture, causing long-term damage[18].

Case Studies

Food aspiration in childhood, particularly with hypersensitivity pneumonitis (HP), remains significantly understudied. While case reports suggest a link between lentil aspiration and lung inflammation, a critical gap exists, especially in regions like Bangladesh. Here, lentils are a dietary staple, and forceful feeding practices are prevalent, potentially increasing aspiration risks.[19,20,21].

In some case reports, children subjected to forceful feeding at the weaning stage often experienced episodes of coughing, choking, and respiratory distress shortly after being fed lentil soup. Physical examination and clinical findings frequently revealed hypoxemia and persistent respiratory symptoms, including cough, fever, and shortness of breath[22]. Bronchoalveolar lavage and high-resolution imaging typically confirmed inflammatory responses consistent with HP, and in many instances, granulomas were detected, often surrounding bronchioles and small airways. This pathological finding is attributed to the unique antigenic composition of lentils, whose cellulose-rich outer layer acts as a granuloma-inducing substance when aspirated into the respiratory tract[23,24].

One retrospective study observed that aspiration-induced HP in children often exhibited faster symptom onset and more severe progression than HP triggered by other inhaled antigens, possibly due to a combination of immune response immaturity and structural characteristics of the infant airway, which can trap particulates and antigens more readily in children than adults[25].

Such case studies underscore the importance of raising awareness among healthcare providers and caregivers about the risks of forceful feeding, especially with lentil-based foods. Comprehensive clinical protocols to assess aspiration risk, especially in infants with pre-existing respiratory conditions, may help prevent HP and its associated complications, including chronic lung damage and pulmonary fibrosis[26].

Clinical features

Aspiration pneumonia resulting from forceful feeding of lentil soup during weaning presents distinctive clinical features. Key symptoms include persistent cough, dyspnea, and fever following lentil aspiration. The cough is often unrelenting and can worsen after feeding sessions, particularly when forceful feeding is involved. Dyspnea manifests as labored breathing or increased respiratory effort, which may cause concern among

caregivers and is often accompanied by tachypnea. Fever generally appears within hours to days post-aspiration and may be persistent[27].

Taking a comprehensive history is critical to establishing a link between the child's symptoms and aspiration events during the weaning period. Inquiry about feeding practices and any episodes of gagging, choking, or coughing during meals can provide essential clues, as these events are often overlooked when diagnosing respiratory issues in infants and young children[28].

Investigations

The investigation of forceful feeding-induced aspiration pneumonia in infants reveals distinctive radiological and cytological findings. In cases where lentil aspiration during weaning causes pneumonia, chest radiographs (CXR) and high-resolution computed tomography (HRCT) scans provide critical diagnostic insights. CXR findings predominantly show involvement of the perihilar and lower lung lobes, with a high prevalence of reticulonodular patterns (44%), isolated consolidation (22%), and combined findings (33%)[29]. CT imaging further elucidates parenchymal abnormalities, where nodular patterns appear in 78% of cases, consolidations in 67%, reticular features in 22%, and ground-glass opacities in another 22%[30]. Notably, HRCT often reveals irregular consolidations and micronodules, particularly in the lower lobes and perihilar regions, reflecting the typical food aspiration pattern in infants[31].

Bronchoalveolar lavage (BAL) evaluation, including bacterial, fungal, and mycobacterial cultures, is essential to rule out infectious causes in patients from regions where tuberculosis and fungal infections are prevalent[32]. BAL cytology is valuable in assessing inflammatory responses, revealing leukocytosis in 89% of patients, with neutrophilic predominance in 57% and lymphocytic involvement in 31%[33].

Lung biopsies typically reveal aspiration pneumonia features with ill-defined inflammatory foci around bronchioles and alveoli, where vegetable tissue fragments, lentil particles, and cellulose wall fragments are visible [34]. Lung biopsy post-lentil aspiration shows foreign body granulomas with starch-rich cores from lentils, indicating a granulomatous inflammatory response. The biopsy reveals centrilobular nodules, a pattern resembling hypersensitivity pneumonitis (HP), with nodular inflammation and multinucleated giant cells characteristic of granulomatous reactions[35]. Chronic cases often show established fibrosis, resulting in persistent radiological findings[36].

Additionally, hypersensitivity to lentil proteins is confirmed through elevated serum IgG specific to lentil proteins, measured by immunoassays like enzyme-linked immunosorbent assay (ELISA), with levels often ranging from 21 milligrams of antigen-specific antibodies per litre (mgA/L) to over 200 mgA/L. Immunoglobulin E (IgE) specific to lentil proteins is also measured in some cases, further indicating the immune sensitivity contributing to pneumonitis[37].

Clinicians are encouraged to consider hypersensitivity pneumonitis as a differential diagnosis in pediatric patients from regions with forceful feeding practices, especially when there are symptoms of fever, persistent pneumonia, and multiple radiologic nodules.

Treatment and Management

Educating caregivers on weaning counselling for proper feeding techniques and recognizing the risks of forceful feeding plays a key role in preventing recurrent aspiration incidents. Initial assessments focus on ruling out other potential infections or underlying conditions before starting specific treatments for aspiration-induced HP[38].

Once infection has been ruled out, corticosteroids, such as prednisolone, are initiated to control inflammation. Prednisolone is typically started at an appropriate dose and then tapered every 1 to 2 weeks based on clinical response. For most children, the maximum duration of corticosteroid therapy spans up to six months to minimize potential long-term side effects. Additionally, proton pump inhibitors (PPIs), such as lansoprazole, are prescribed to 89% of patients to manage gastroesophageal reflux, which can exacerbate aspiration risk. Prokinetic agents, including domperidone, are prescribed to about 33% of children to enhance gastric emptying, further reducing the chance of aspiration[39].

Close follow-up and monitoring are essential for evaluating the response to treatment and adjusting therapy as necessary. Regular imaging and symptom tracking are advised to assess ongoing inflammation or signs of fibrosis, which may occur in chronic cases. Early intervention and preventive counseling prove to be highly effective in improving outcomes, preventing recurrence, and reducing the risk of chronic lung damage in affected infants and young children[40].

Prevention

Preventing aspiration pneumonia related to forceful feeding involves educating caregivers on safe weaning

practices and the dangers of forced feeding. Proper feeding techniques and allowing self-paced eating reduce aspiration risks significantly. Counseling caregivers about gentle, responsive feeding can prevent HP and improve overall child health[41].

Conclusion

The practice of forceful feeding during weaning, particularly in South Asia, where lentil soup is commonly introduced, has been identified as a significant risk factor for aspiration pneumonia and subsequent development of hypersensitivity pneumonitis (HP) in young children. Given the potential for long-term lung damage, it is critical to emphasize early identification, thorough investigation, and timely intervention in affected pediatric patients.

Investigation of suspected aspiration-induced HP in children should involve a comprehensive approach, including radiological assessment through chest X-rays and high-resolution computed tomography (HRCT) to identify characteristic lung changes, such as reticulonodular patterns, consolidations, and micronodules. Bronchoalveolar lavage (BAL) and lung biopsy play a crucial role in confirming the diagnosis, revealing granulomatous inflammation and foreign body reactions indicative of HP. Additionally, serum IgG and IgE testing for lentil proteins can be an important diagnostic tool in confirming hypersensitivity to lentils.

From a treatment perspective, a well-structured management plan is necessary to address both the acute inflammatory response and the prevention of further damage. Corticosteroids, such as prednisolone, should be administered to control inflammation, with gradual tapering based on clinical response. For children at high risk of aspiration due to gastroesophageal reflux, proton pump inhibitors (PPIs) and prokinetic agents may be prescribed to alleviate reflux and enhance gastric emptying, thereby reducing the likelihood of aspiration. Close follow-up and regular imaging are essential to monitor disease progression and adjust treatment as needed, particularly in chronic cases where fibrosis may occur.

Most importantly, education and preventive counseling for caregivers are key to reducing the incidence of aspiration-related HP. Promoting safe and responsive feeding techniques and discouraging forceful feeding practices are critical steps in safeguarding pediatric respiratory health. By implementing these measures, healthcare professionals can significantly reduce the risk of aspiration pneumonia, HP, and associated chronic respiratory complications in young children[42].

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Abstracts

Autoimmune and Infectious Encephalitis: Development of A Discriminative Tool for Early Diagnosis and Initiation of Therapy

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Background: Encephalitis originates from diverse autoimmune and infectious etiologies. Diagnostic challenges arise due to the spectrum of presentation and the frequent absence of specific biomarkers. This study aimed to comprehensively characterize and differentiate autoimmune encephalitis (AE) from infectious encephalitis (IE) in adults, and disentangle clinical, paraclinical, and therapeutic differences.

Methods: A cohort study spanning 10 years was conducted across three Austrian tertiary care hospitals. Inclusion criteria comprised adults with probable or definite encephalitis. Demographics, clinical features, technical findings, treatment modalities, and outcomes were collected from the electronic patient files. A follow-up was performed via telephone interviews and clinical visits.

Results: Of 149 patients, 17% had AE, 73% IE, and 10% encephalitis of unknown etiology. Significant differences between AE and IE included the prevalence of acute symptomatic seizures (AE: 85% vs. IE: 20%, $p<0.001$), fever (8% vs. 72%, $p<0.001$), headache (15% vs. 61%, $p<0.001$), and focal neurological deficits (56% vs. 23%, $p=0.004$), respectively. Paraclinical differences comprised lower CSF pleocytosis in AE compared to IE (median 6 cells/µl vs. 125 cells/µl, $p<0.001$). Epileptic discharges on EEG and MRI lesions were more prevalent in AE than IE (50% vs. 14%, $p<0.001$; 50% vs. 28%, $p=0.037$). The modified Rankin Scale scores at discharge and last follow-up (median duration 2304 days, IQR 1433–3274) indicated favorable outcomes in both groups.

Conclusion: This comprehensive analysis provides insights into the epidemiology, clinical, paraclinical, and therapeutic aspects and the outcomes of AE and IE in adults. We developed a diagnostic tool that facilitates early differentiation between AE and IE, aiding in timely therapeutic decision-making.

Keywords: Encephalitis, Inflammation, Infection, Differential diagnosis, Prognosis, Therapeutic management

Reference: Moser T, Gruber J, Mylonaki E, Böhm V, Schwarzenhofer D, Tröscher AR, Lenzenweger E, Krehan I, Söllradl E, Leitinger M, Helbok R. Autoimmune and infectious encephalitis: development of a discriminative tool for early diagnosis and initiation of therapy. Journal of Neurology. 2024;271(12): p7583-7591

Human metapneumovirus infection is associated with a substantial morbidity and mortality burden in adult inpatients

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Background: Human metapneumovirus (hMPV) is one of the leading respiratory viruses. This prospective observational study aimed to describe the clinical

features and the outcomes of hMPV-associated lower respiratory tract infections in adult inpatients.

Methods: Consecutive adult patients admitted to one of the 31 participating centers with an acute lower respiratory tract infection and a respiratory multiplex PCR positive for hMPV were included. A primary composite end point of complicated course (hospital death and/or the need for invasive mechanical ventilation) was used.

Results: Between March 2018 and May 2019, 208 patients were included. The median age was 74 [62–84] years. Ninety-seven (47%) patients were men, 187 (90%) had at least one coexisting illness, and 67 (31 %) were immunocompromised. Median time between first symptoms and hospital admission was 3 [2–7] days. The two most frequent symptoms were dyspnea (86 %) and cough (85%). The three most frequent clinical diagnoses were pneumonia (42%), acute bronchitis (20%) and acute exacerbation of chronic obstructive pulmonary disease (16%). Among the 52 (25 %) patients who had a lung CT-scan, the most frequent abnormality was ground glass opacity (41 %). While over four-fifths of patients (81%) received empirical antibiotic therapy, a bacterial coinfection was diagnosed in 61 (29%) patients. Mixed flora (16%) and enterobacteria (5%) were the predominant documentations. The composite criterion of complicated course was assessable in 202 (97 %) patients, and present in 37 (18%) of them. In the subpopulation of pneumonia patients (42%), we observed a more complicated course in those with a bacterial coinfection (8/24, 33 %) as compared to those without (5/60, 8%) ($p = 0.02$). Sixty (29%) patients were admitted to the intensive care unit. Among them, 23 (38 %) patients required invasive mechanical ventilation. In multivariable analysis, tachycardia and alteration of consciousness were identified as risk factors for complicated course.

Conclusion: hMPV-associated lower respiratory tract infections in adult inpatients mostly involved elderly people with pre-existing conditions. Bacterial coinfection was present in nearly 30% of the patients. The need for mechanical ventilation and/or the hospital death were observed in almost 20% of the patients.

Keywords: Human metapneumovirus, Pneumonia, Viral pneumonia, Respiratory viruses

Reference: Philippot Q, Rammaert B, Dauriat G, Daubin C, Schlemmer F, Costantini A, Tandjaoui-Lambiotte Y, Neuville M, Desrochettes E, Ferré A, Contentin LB. Human metapneumovirus infection is associated with a substantial morbidity and mortality burden in adult inpatients. Heliyon. 2024;10(13), e33231

News

Asian Pacific Digestive Week (APDW) 2024

Presenter name	:	**Prof. Dr. Md Akmat Ali**
Designation	:	Professor (CC)
Department	:	Department of Hepatology, Ad-din Women's Medical College, Dhaka
Type of presentation	:	Pre-recorded video
Presented At	:	Asian Pacific Digestive Week (APDW) 2024
Venue	:	Bali, Indonesia
Date	:	20/11/2024- 25/11/2024

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

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