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Editorial

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Yellow Journalism in the Medical Profession: A Double-Edged Sword

Pradip Kumar Dutta[1*]

Yellow journalism refers to sensationalized and exaggerated reporting that prioritizes attention over accuracy. Within the medical profession, such reporting may temporarily raise awareness but often results in misinformation, distrust and adverse outcomes. This editoreal explores the advantages, disadvantages, and effects of yellow journalism on patients and healthcare providers.

The term yellow journalism originated in the late 19th century, describing exaggerated and sensational reporting designed to attract readership rather than provide factual information. In the medical field, this practice can distort scientific evidence, overemphasize risks or present unproven therapies as breakthroughs. While it may momentarily increase awareness, it carries significant negative implications for patients, physicians and healthcare systems.[1]

Advantages

Although widely criticized, yellow journalism in medicine presents some perceived benefits:

- *Public Awareness:* Sensational reporting often brings attention to new or neglected health issues. For example, heightened media coverage of infectious outbreaks such as Ebola or COVID-19 improved awareness about hygiene and preventive measures.[2]
- *Stimulating Debate:* Controversial coverage can initiate dialogue, encouraging experts to clarify misinformation and educate the public.[3]
- *Commercial Interests:* From a media perspective, exaggerated headlines increase readership and financial gain.[4]

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Disadvantages

The harms associated with yellow journalism in healthcare are more profound:

- *Misinformation:* Exaggerated claims about therapies or risks mislead patients, reducing informed decision-making.[5]
- *Loss of Trust:* Once misinformation is exposed, public confidence in physicians, scientists and healthcare systems deteriorates.[6]
- *Fearmongering:* Sensational coverage of rare adverse effects or diseases can trigger mass panic and irrational behaviors.[7]
- *Promotion of Pseudoscience:* Unregulated supplements, "Miracle cures" or conspiracy-driven narratives may be accepted over evidence-based practices.[8]

Effects on Patients

The consequences for patients are direct and multifaceted:

- *Psychological Impact:* Panic, anxiety or false hope may arise from exaggerated headlines (e.g Vaccine safety debates).[9]
- *Behavioral Changes:* Patients may avoid safe and effective interventions (Such as vaccines) or adopt harmful alternatives.[10]
- *Social Stigma:* Sensational reporting of infectious or mental illnesses reinforces stigma and discrimination.[11]
- *Clinical Outcomes:* Delays in diagnosis and treatment, poor adherence to therapy and worsened morbidity and mortality may result.[12]

Effects on Healthcare Providers

Healthcare providers are also affected by yellow journalism, both professionally and emotionally:

- *Erosion of Patient–Physician Trust:* When patients are influenced by misleading reports, they may question medical advice, leading to strained doctor–patient relationships.[13]

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- *Increased Workload:* Providers spend significant time debunking myths, clarifying misinformation and counseling anxious patients.[14]
- *Reputational Damage:* Sensationalized reports of isolated medical errors or side effects can tarnish the image of individual clinicians or entire institutions,[15]
- *Moral Distress and Burnout:* Repeated confrontation with misinformed patients, coupled with negative public perception, contributes to stress, frustration and burnout among healthcare workers.[16]
- *Legal and Ethical Challenges:* In some cases, exaggerated reporting of adverse outcomes triggers medico-legal complaints and lawsuits against providers.[17]

Yellow journalism in the medical profession functions as a double-edged sword. While it occasionally raises awareness, its overwhelming disadvantages-misinformation, loss of trust, fearmongering, increased workload for providers and poor health outcomes-significantly outweigh any benefits. Ethical, evidence-based reporting is essential to protect both patients and healthcare providers while ensuring the credibility of medicine as a science and profession.

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Review Article

Marine City Medical College Journal

Artificial Intelligence in Cancer Diagnosis: Focus on Breast, Lung and Cervical Cancers

Pradip Bhattacharjee[1*]

Background: Artificial Intelligence (AI) is rapidly transforming cancer diagnostics, particularly in high-burden cancers such as breast, lung and cervical cancers. Recent advances in deep learning, imaging analysis, digital pathology and clinical decision support have demonstrated performance on par with expert clinicians. This review summarizes current evidence (2022–2025) on AI applications in imaging, histopathology, biomarker analysis and clinical decision support for these cancers, highlighting advantages, limitations and future directions.

Methodology: The current study is a review of published studies and articles by searching PubMed and Google Scholar with search strategy using appropriate key words and titles.

Conclusion: Overall this review provides critical insights into the current state of AI in the clinical settings of cancer diagnosis.

Key words: Artificial Intelligence (AI); Breast cancer, Cervical cancer; Cancer diagnosis; Lung cancer.

INTRODUCTION

Cancer remains a leading cause of mortality worldwide, and early, accurate diagnosis is central to improving outcomes. Breast, lung and cervical cancers collectively account for millions of deaths annually. Traditional diagnostic modalities, though effective are limited by inter-observer variability, time intensity and shortage of trained specialists. Artificial Intelligence (AI) especially deep learning, has emerged as a tool to augment and enhance cancer diagnosis across modalities.[1,2]

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SEARCH STRATEGY

The following databases were searched to retrieve all literature with meaningful and appropriate data regarding the research topic : PubMed and Google Scholar from 2022-2025. The search terms included the following key words: "Artificial Intelligence (AI) Breast Cancer; Cervical cancer; Cancer diagnosis; Lung Cancer." and Medical Subject Heading (MeSH): "Artificial Intelligence in Cancer Diagnosis: Focus on Breast, Lung and Cervical cancer terms with various combinations.

DISCUSSION

AI in Breast Cancer Diagnosis

Mammography and Imaging

* AI-assisted mammography systems (e.g., Transpara, Lunit INSIGHT) have shown detection rates equal to or exceeding radiologists.[3]
* Large trials (MASAI trial, Sweden, 2023; PRAIM trial, Germany, 2025) demonstrated 15–20% increase in cancer detection rates without raising false positives.[4]
* AI can triage normal cases, reduce radiologist workload, and highlight subtle findings.[5]

Pathology and Biomarkers

* AI algorithms in digital pathology identify metastases in sentinel lymph nodes with high sensitivity.[6]
* Emerging studies show prediction of molecular subtypes (e.g. Hormone receptor-positive vs. triple-negative) directly from H&E slides.[7]

AI in Lung Cancer Diagnosis

Chest CT Imaging

* AI models can automatically detect pulmonary nodules and classify malignancy risk with sensitivity and accuracy comparable to experts.[8]

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* Google's 3D CNN model achieved AUC ~0.94 in NLST data.[8]
* Sybil model (2023) predicts future lung cancer risk from a single low-dose CT scan up to 6 years in advance.[9]

Histopathology and Biomarkers

* AI distinguishes histologic subtypes (Adenocarcinoma vs. squamous carcinoma).[10]
* Deep learning models predict actionable mutations (EGFR, KRAS) and immunotherapy markers (PD-L1) from histology slides.[11]

AI in Cervical Cancer Diagnosis

Cytology and Visual Screening

* AI-assisted Pap smear analysis shows~95% sensitivity and specificity, significantly reducing false negatives.[12]
* Automated Visual Evaluation (AVE) of cervix images surpasses colposcopists in detecting precancerous lesions.[13]
* AI can triage slides, flagging abnormal fields for cytologists, reducing workload.[14]

Pathology and Biomarkers

* AI integrated with HPV testing refines triage, improving specificity in screening pathways.[5]
* AI-based digital cytology platforms (e.g. Hologic Genius Digital Diagnostics) are being clinically deployed.[6]

AI in Clinical Decision Support

* AI-based systems assist tumor boards by integrating radiology, pathology and genomics into coherent reports.[17]
* Risk stratification models predict individual risk and guide screening intervals.[9]
* Early systems like IBM Watson for Oncology had mixed results, but newer AI-CDS tools show high concordance with expert decisions (85–95%).[18]

Advantages of AI in Cancer Diagnosis

* Improved sensitivity and early detection.[4]
* Consistency: Eliminates inter-observer variability.[1]
* Efficiency: Reduces workload and turnaround time.[5]
* Multimodal insights: Integrates imaging, pathology, genomics.[2]
* Expanded access: Addresses specialist shortages, useful in low-resource settings.[13]

LIMITATIONS AND CHALLENGES

* Data bias and generalizability issues.[19]
* False positives and potential alarm fatigue.[8]
* Interpretability: Black-box models reduce clinician trust.[20]
* Integration challenges: Workflow and infrastructure barriers.[21]
* Regulatory and ethical considerations: Liability, data privacy, patient consent.[22]

FUTURE DIRECTIONS

- Multimodal AI combining radiology, pathology, genomics.[23]
- Explainable AI to improve trust and adoption.[24]
- Federated learning to overcome data-sharing barriers.[25]
- Prospective clinical trials for robust validation.[4]
- Integration into population-level screening programs (MASAI, PRAIM).[26]

CONCLUSION

AI is no longer a proof-of-concept but a rapidly maturing tool in cancer diagnosis. In breast, lung and cervical cancers, AI enhances detection, reduces workload and enables more personalized care. While limitations in validation, interpretability, and integration remain, ongoing research and real-world deployments suggest a future where AI will be a routine, indispensable partner in oncologic diagnostics.

DISCLOSURE

The author declared no conflicts of interest.

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Original Article

Marine City Medical College Journal

Clinical Pattern of Chikungunya in a Tertiary Care Hospital

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ABSTRACT

Background: Chikungunya is a mosquito-borne viral illness characterized by acute onset fever and severe polyarthralgia, transmitted by Aedes aegypti and Aedes albopictus. Bangladesh, particularly Chattogram, has experienced periodic outbreaks, yet local clinical data remain limited. To describe the demographic, clinical, and laboratory features of Chikungunya cases in a tertiary care hospital in Chattogram over three months.

Materials and methods: A descriptive cross-sectional study was conducted in the Outpatient and Inpatient Departments of the Department of Medicine, Marine City Medical College and Hospital, Chattogram, from January to March 2024. A total of 110 patients meeting WHO case definitions for Chikungunya were enrolled, including 23 confirmed (RT-PCR and/or IgM positive) and 87 probable/possible cases. Data were collected prospectively using a structured Case Record Form and analyzed descriptively.

Results: The mean age was 36.1 ± 13.6 years, with half of patients aged 21–40 years; males slightly out numbered females (Ratio 1.1:1). Urban residents comprised 63.6% of cases. Fever (96.4%) and arthralgia (95.5%) were the predominant symptoms, followed by headache (74.5%) myalgia (70.9%) rash (49.1%) and fatigue (54.5%). Swollen tender joints were present in 74.5% of cases, with both large and small joints involved. Laboratory findings included thrombocytopenia (30%) leukopenia (25%) elevated ESR (60%) and SGPT abnormalities (7.3%). IgM antibodies were detected in 18.2% and RT-PCR positivity in 2.7%. Hospitalization was required in 30% of patients, with complications including hepatitis (7.3%) bleeding (2.7%) shock (1.8%) and encephalitis (0.9%).

Conclusion: Fever and arthralgia remain the hallmark features of Chikungunya in Chattogram, accompanied by frequent hematological changes and occasional systemic complications. Most patients recovered with supportive care, but nearly one-third required hospitalization, reflecting the disease burden. The predominance of urban cases underscores the need for strengthened vector control, while improved diagnostic capacity and clinical awareness are essential to reduce morbidity and prevent future outbreaks.

Key words: Arthralgia; Chikungunya; Clinical pattern; Outbreak.

INTRODUCTION

Chikungunya Virus (CHIKV) an arthropod-borne alphavirus of the family Togaviridae, was first identified in Tanzania in 1952 and derives its name from a Makonde word meaning "That which bends up," a reference to the stooped posture induced by incapacitating joint pain.[1,2] The virus is transmitted predominantly by Aedes aegypti and Aedes albopictus mosquitoes.[3,4] Following an incubation period of 2–12 days, patients typically experience a sudden onset of high fever, severe polyarthralgia, myalgia, rash, headache, and occasionally gastrointestinal and neurological manifestations.[5-8]

Acute chikungunya illness usually lasts one week, but chronic arthralgia may persist for months to years, particularly affecting peripheral joints such as wrists, knees, ankles, and small joints of hands and feet.[5-7,9] Joint pain occurs in as many as 87–98% of cases and often presents bilaterally and symmetrically.[5,10] Rare but serious complications—such as encephalitis, cardiovascular involvement and hepatitis—are more common among infants, older adults, and individuals with comorbid conditions.[11,12] In most instances,

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chikungunya is self-limiting with a low case fatality rate (<1 per 1,000) although morbidity can be substantial.[5,13,14]

Epidemiologically, CHIKV has re-emerged globally over the past two decades, causing large outbreaks across Asia, Africa, the Indian Ocean islands, the Americas and parts of Europe.[15-17] The global burden is concerning: over 39% of the world's population lives in endemic areas, and annual mortality related to chikungunya has risen from 87 in 2022 to approximately 350 by late 2023.[18] Climate change, urbanization, and increased international travel have facilitated the geographic expansion of vectors and disease transmission.[14,19]

In tertiary care hospital–based studies, chikungunya consistently demonstrates an abrupt onset of fever with disabling polyarthralgia as the hallmark clinical features.[20,21] A tertiary hospital in Nagpur, India reported detailed clinical profiles during a 2006 outbreak, features included fever, arthralgia, rash and constitutional symptoms in both inpatients and outpatients.[22] Seroprevalence studies from tertiary centers in India report clinical presentations similar to the classic triad of fever, arthralgia and rash, with seasonal variation and low case fatality.[23-25]

Understanding clinical patterns within hospital settings is essential for timely case identification and management, especially in endemic regions. In Bangladesh which hosts competent vectors and has experienced outbreaks, notably in 2017 chikungunya remains among its neglected tropical diseases, severe arthropathy, rash, headache and myalgia were prominent features in one outbreak cohort.[26] Tertiary care facilities in that region encounter patients across the spectrum from confirmed to probable and possible cases and often face limitations in diagnostic resources.

This study aims to characterize the clinical pattern of chikungunya over a three-month period in a tertiary care hospital, including all 110 patients (23 laboratory-confirmed cases and 87 probable/possible) to elucidate demographic profiles, symptomatology, laboratory findings, management, complications and short-term outcomes. Such data are crucial for optimizing clinical protocols, improving diagnostic algorithms and informing public health strategies to mitigate chikungunya's healthcare burden.

MATERIALS AND METHODS

This was a descriptive cross-sectional observational study conducted in both the Outpatient Department (OPD) and Inpatient Department (IPD) of the Department of Medicine, Marine City Medical College and Hospital, Chattogram, Bangladesh. The study period extended from January to March 2024.

All patients who presented during the study period with a clinical suspicion of Chikungunya, based on the WHO case definitions, were evaluated. Both laboratory-confirmed cases (via RT-PCR or IgM ELISA) and probable/possible cases were included according to predefined diagnostic criteria. Clinical data, laboratory findings, treatment details, and follow-up information were collected using a standardized Case Record Form (CRF).

A total of 110 patients were enrolled in the study. Of these, 23 patients were classified as confirmed cases based on laboratory evidence of Chikungunya virus infection (Positive RT-PCR and/or IgM ELISA) while the remaining 87 patients were categorized as probable or possible cases according to WHO case definitions. All age groups and both sexes were included.

Patients unwilling to participate, those with incomplete clinical data and those with alternative diagnoses explaining their symptoms were excluded.

Inclusion criteria

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

- Attended the OPD or IPD of the Department of Medicine, Marine City Medical College and Hospital during the study period (January to March 2024)
- Presented with acute febrile illness and clinical features consistent with Chikungunya infection, as per WHO case definitions.
- Classified as:
  - o Confirmed case: Laboratory evidence of Chikungunya virus infection (Positive RT-PCR and/or IgM ELISA).
  - o Probable case: Clinically compatible illness with an epidemiological link to confirmed cases.
  - o Possible case: Clinically compatible illness without laboratory confirmation or clear epidemiological link.
- Provided informed consent for participation in the study.

Exclusion criteria

- Had alternative confirmed diagnoses explaining their symptoms (e.g. Dengue, malaria, typhoid fever).
- Had incomplete clinical data in the Case Record Form (CRF).
- Declined to participate or withdrew consent at any point during the study.

Of these, 23 patients (20.9%) were classified as confirmed cases based on positive laboratory tests (RT-PCR and/or IgM ELISA), while 87 patients (79.1%) were categorized as probable or possible cases according to WHO case definitions. The sample size was determined by consecutive sampling of all cases presenting during the specified period, as no formal sample size calculation was performed due to the descriptive nature of the study.

Data were collected prospectively using a structured Case Record Form (CRF) specifically designed for this study, capturing demographic, clinical and laboratory information for each patient at the time of presentation.

Demographic variables included age, sex, address (Urban or non-urban) past history of arthropathy and comorbidities such as diabetes mellitus, chronic kidney disease and hypertension.

Clinical history documented symptom onset, duration and pattern, including fever, rash, headache, myalgia, arthralgia, vomiting, bleeding manifestations, neurological symptoms, diarrhoea, sore throat, pigmentation and any other relevant complaints.

On examination, vital signs (Temperature, pulse rate, systolic and diastolic blood pressure, respiratory rate) were recorded, along with the presence of edema and details of joint involvement (number of joints, size, and distribution large, small or mixed).

Laboratory investigations included complete blood count, differential leukocyte count, platelet count, hematocrit, and where available, additional tests such as liver and renal function tests. Laboratory confirmation of Chikungunya virus infection was established using RT-PCRand/orIgM ELISA.

Details of hospital course were recorded, including hospitalization status, duration of hospital stay, treatments administered (IV fluids, paracetamol, NSAIDs, antibiotics, steroids, blood products and others) and any complications (Shock, bleeding, hepatitis, encephalitis or other specified outcomes).

Data from all eligible patients were entered into a secure database and analyzed using Statistical Package for the Social Sciences (SPSS) software, version 26 (IBM Corp., Armonk, NY, USA). Continuous variables, such as age, duration of symptoms, vital signs, and laboratory values, were summarized as mean ± Standard Deviation (SD) for normally distributed data, or median with interquartile range (IQR) for non-normally distributed data. Categorical variables, including sex, address type, presence of comorbidities, clinical symptoms, laboratory confirmation status, hospitalization, treatment modalities and complications, were expressed as frequencies and percentages.

Comparisons between confirmed and probable/possible cases were performed using the Chi-square test or Fisher's exact test for categorical variables and independent samples t-test or Mann–Whitney U test for continuous variables, depending on data distribution.

All participants, or their legal guardians in the case of minors, were informed about the objectives, procedures, potential benefits and minimal risks associated with the study. Written informed consent was obtained from each participant before enrollment. Patient confidentiality was strictly maintained throughout the study, personal identifiers were omitted from the data set, and all information was used solely for research purposes.

RESULTS

Table I Demographic and Case Classification (n = 110)

Variable	Frequency (n)	Percentage (%)
Confirmed cases	23	20.9
Probable/Possible cases	87	79.1
Mean age (Years)	—	36.1 ± 13.6
Age group (Years)		
• 0–10	6	5.5
• 11–20	12	10.9
• 21–40	55	50.0
• 41–50	20	18.2
• >50	17	15.5
Sex (Male:female)	1.1:1	—
Urban residence	70	63.6
Non-urban residence	40	36.4

Table I represents the distribution of confirmed, probable and possible cases of chikungunya as per WHO case definitions. Mean age is expressed as mean ± Standard Deviation (SD). Percentages are calculated based on the total study population (n = 110)

Table II Clinical Presentations (n = 110)

Symptom	Frequency (n)	Percentage (%)
Fever	106	96.4
Arthralgia	105	95.5
Rash	54	49.1
Headache	82	74.5
Myalgia	78	70.9
Fatigue	60	54.5
Vomiting	40	36.4
Nausea	38	34.5
Other (e.g. Abdominal pain)	20	18.2

Table II shows the requencies and percentages reflect the proportion of patients presenting with each symptom. Percentages are calculated out of total cases (n = 110).

Table III Laboratory Findings (n = 110)

Parameter	Mean ± SD	Abnormal (%)
WBC count ($\times 10^9$/L)	5.2 ± 1.5	Leukopenia: 25.0
Neutrophil (%)	54 ± 10	—
Lymphocyte (%)	38 ± 8	—
Platelets ($\times 10^9$ /L)	152 ± 48	Thrombocytopenia: 30.0
Hematocrit (%)	38 ± 4	Low: 20.0
LFT abnormality (SGPT)	58 ± 20	7.3
RFT abnormality	—	3.6
CHIKV RT-PCR positive	3	2.7
CHIKV IgM positive	20	18.2

In table III laboratory values are expressed as mean ± Standard Deviation (SD). Abnormal findings are shown as percentages of total cases (n=110). Thrombocytopenia was defined as platelet count <150 × 0^9/L, leukopenia as WBC count <4.0 × 0^9/L, low hematocrit as <35%. LFT and RFT abnormalities indicate values above the institutional reference range.

Table IV Hospital Course and Complications (n=110)

Variable	Frequency (n)	Percentage (%)
Hospitalized	33	30.0
Mean duration of stay (Days)	—	4.5 ± 2.0
IV fluids administered	33	30.0
Analgesics (Paracetamol)	95	86.4
NSAIDs used	20	18.2
Antibiotics given	25	22.7
Steroids used	5	4.5
Shock	2	1.8
Bleeding events	3	2.7
Hepatitis (LFT deranged)	8	7.3
Encephalitis	1	0.9
Other complications	5	4.5

Table IV shows percentages that are based on the total study population (n = 110). Hospitalization duration is expressed as mean ± SD. Complications were diagnosed clinically and/or supported by laboratory findings (e.g. Hepatitis by elevated liver enzymes, encephalitis by neurological features).

Table V Joint Involvement Pattern (n=110)

Variable	Frequency (n)	Percentage (%)
Swollen tender joints	82	74.5
Joint type		
• Large joints	25	22.7
• Small joints	30	27.3
• Mixed joints	27	24.5
Median number of joints	4 (3–6)	—

Table V shows joint involvement patterns (n=110) in percentages as well as frequency

DISCUSSION

The mean age of patients was 36.1 years, with half of the cases falling in the 21–40 year age group. This observation is consistent with reports from earlier outbreaks in Bangladesh and India where young and middle-aged adults were the most affected.[25-27] The predominance of this age group can be explained by higher exposure to mosquito bites during working hours as well as increased mobility. A slight male predominance was observed (Male: Female ratio 1.1:1), which is in agreement with other South Asian studies, although some outbreaks have reported a higher proportion of females, possibly due to greater household exposure.[28,29] Urban residents comprised

63.6% of the cases, underscoring the important role of Aedes aegypti as the dominant vector in densely populated urban areas.[14,30] At the same time, the presence of more than one-third of patients from non-urban areas reflects the contribution of Aedes albopictus and indicates the gradual spread of the disease into peri-urban and rural communities.[31]

Clinically, fever (96.4%) and arthralgia (95.5%) were the most prominent features, reaffirming their role as the hallmarks of Chikungunya.[5,6,32] Arthralgia was widespread and frequently severe, with swollen tender joints documented in 74.5% of patients. Both large and small joints were affected, either alone or in combination, with a median of four joints involved, reflecting the polyarthritis-like pattern described in previous studies.[9,33] Headache (74.5%), myalgia (70.9%) and fatigue (54.5%) were also frequent, while rash was seen in 49.1% of patients. These findings are comparable to clinical patterns reported from outbreaks in the Indian Ocean islands and India.[5,10,20] Gastrointestinal manifestations, though less common, were still notable with vomiting in 36.4% and diarrhoea in 18.2% of cases. Such symptoms have been documented in earlier reports as non-specific but relevant systemic features.[34]

Laboratory evaluation revealed hematological and biochemical abnormalities consistent with those described in the literature. Thrombocytopenia was present in 30% of cases and leukopenia in 25%, changes that have been widely reported in previous Bangladeshi studies and other epidemic settings.[26] Elevated ESR was noted in 60% of patients, reflecting systemic inflammation. Anemia and low hematocrit were less common but still observed in a minority. Liver involvement was evident in 7.3% of patients as elevated SGPT, while renal impairment was documented in 3.6%. These findings highlight the multi-systemic nature of the infection and are consistent with observations from India and Reunion Island, where hepatic and renal abnormalities were variably reported.[39] Laboratory confirmation was achieved in 20.9% of cases, with IgM detected in 18.2% and RT-PCR positivity in 2.7%. The higher IgM detection reflects presentation beyond the acute viremic phase, while the low RT-PCR positivity may be attributed to delayed hospital visits and limited diagnostic capacity, as also reported in previous Bangladeshi outbreaks.[26,36,24]

Hospitalization was required in 30% of patients, with a mean duration of stay of 4.5 days. Supportive therapy with IV fluids and analgesics was the mainstay of management, with paracetamol prescribed to the majority (86.4%). NSAIDs were used in 18.2%, while antibiotics and steroids were administered more sparingly. This treatment profile reflects adherence to standard management protocols that emphasize symptomatic relief.[20] Complications were observed in a minority, including hepatitis in 7.3%, bleeding in 2.7%, shock in 1.8% and encephalitis in 0.9%. These findings are in line with previous evidence that while Chikungunya is usually self-limiting, severe and atypical manifestations may occur, particularly among patients with comorbidities or more severe acute disease.[11,12,37] The overall clinical course in most patients was uncomplicated, with 82.7% recovering without major sequelae during the acute phase.

The findings of this study are largely consistent with previous research conducted during outbreaks in Bangladesh, India and the Indian Ocean islands.[25,32,37] However, the proportion of laboratory-confirmed cases in this series was somewhat lower, likely reflecting both the short study period and diagnostic limitations. The predominance of urban cases emphasizes the urgent need for vector control measures in densely populated neighborhoods, while the age profile highlights the socio-economic burden of lost productivity during the acute illness.

This study has important implications for clinical practice and public health in Bangladesh. Clinicians should be aware of the characteristic presentation of fever and arthralgia, supported by laboratory evidence of leukopenia and thrombocytopenia, to differentiate Chikungunya from other febrile illnesses such as dengue and malaria. Public health authorities should prioritize integrated vector management and expand diagnostic capacity, especially during outbreak periods.

This study confirms that fever and arthralgia remain the dominant features of Chikungunya in Chattogram, with frequent systemic and hematological manifestations and occasional complications. Although the majority of patients recovered with supportive treatment, the disease continues to pose a significant health burden. Strengthened surveillance, improved diagnostic facilities, and sustained vector control remain crucial to reducing morbidity and preventing future outbreaks in Bangladesh.

LIMITATIONS

This study has several limitations. First, it was conducted over a relatively short period of three months, which may not capture seasonal variations in the clinical presentation of Chikungunya. Second, as the study was carried out in a single tertiary care hospital, the findings may not be generalizable to the wider community or to primary healthcare settings. Third, laboratory confirmation was not available for all patients; therefore, probable and possible cases were included based on clinical and epidemiological criteria, which may have led to misclassification. Fourth, detailed virological and serological profiling, including differentiation between acute and past infections, was not performed for all cases due to resource constraints. Lastly, no follow-up was conducted beyond the acute phase, so the study could not assess long-term complications such as chronic arthropathy or quality of life outcomes.

CONCLUSION

This study conducted in a tertiary care hospital in Chattogram highlights the characteristic clinical pattern of Chikungunya. Fever and arthralgia were the most consistent presenting features, often accompanied by headache, myalgia, rash and systemic symptoms. Hematological abnormalities such as thrombocytopenia and leukopenia, along with occasional hepatic involvement, were frequently observed, while complications like hepatitis, bleeding, shock, and encephalitis were uncommon but clinically significant. Most patients recovered with supportive management, yet nearly one-third required hospitalization, underscoring the substantial burden on health services. The predominance of urban cases emphasizes the role of vector ecology in transmission, while the age profile points to its socio-economic impact on the working population. Strengthened diagnostic capacity, sustained vector control, and heightened clinical awareness remain essential to reduce the morbidity associated with Chikungunya and to prevent future outbreaks in Bangladesh.

RECOMMENDATION

It is recommended to enhance awarencess remain essential to reduce the morbidity of chikungunya and to prevent future outbreaks in Bangladesh.

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AUTHORS CONTRIBUTION

Contribution to Concept, Design and Data - MGF, SP
Accountability - MGF, SP, KU, MNI
Drafting and Critical revision - MGF, SP
Final approval - MGF, SP, KU, MNI.

DISCLOSURE

All the authors declared no conflicts of interest.

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Original Article

Marine City Medical College Journal

Comparative Analysis of Serum Creatinine and Albuminuria as Biomarkers for Diabetic Nephropathy in Young Patients with Type 2 Diabetes

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ABSTRACT

Background: Diabetic nephropathy is a significant complication of Type 2 Diabetes Mellitus (T2DM), and early detection is crucial for management and treatment. This study compares serum creatinine and albuminuria as biomarkers for diabetic nephropathy in young patients with T2DM.

Materials and methods: An observational cross-sectional study was conducted from June to December 2023 at Square Hospitals Ltd. in Dhaka, Bangladesh. 105 Bangladeshi patients aged 18 to 30 years, diagnosed with T2DM, were included. Data collected included demographic information, clinical characteristics, and family history of diabetes. Serum creatinine and albuminuria levels were measured and analyzed.

Results: The study population comprised 52.4% males and 47.6% females. Education levels were higher secondary (42.9%), graduate (38.1%), and post-graduate (19.0%). A family history of diabetes was present in 66.7% of patients. Serum creatinine levels were normal in 42.9%, elevated in 33.3%, and high in 23.8% of patients. Albuminuria levels were normal in 47.6%, with 33.3% having microalbuminuria and 19.1% having macroalbuminuria. There was a significant correlation between longer duration of diabetes and elevated serum creatinine (p=0.004) as well as higher albuminuria levels (p=0.002). Elevated and high serum creatinine levels were significantly associated with microalbuminuria and macroalbuminuria (p=0.008).

Conclusion: Both serum creatinine and albuminuria are effective biomarkers for detecting diabetic nephropathy in young patients with T2DM. Elevated and high levels of these biomarkers are strongly associated with a longer duration of diabetes, indicating their potential use in early detection and management of diabetic nephropathy in this population.

Key words: Albuminuria; Diabetic Nephropathy; Serum Creatinine; Type 2 Diabetes.

INTRODUCTION

Diabetes Mellitus is a global health concern, with Type 2 Diabetes Mellitus (T2DM) being the most prevalent form, characterized by insulin resistance and progressive beta-cell dysfunction. The increasing incidence of T2DM, particularly among younger populations, has raised concerns due to its associated complications, including diabetic nephropathy, a leading cause of Chronic Kidney Disease (CKD) and end-stage renal disease (ESRD). Early detection and management of diabetic nephropathy are critical to prevent its progression and associated morbidity and mortality[1-3].

Diabetic nephropathy, a microvascular complication of diabetes, is marked by progressive renal damage characterized by albuminuria, declining Glomerular Filtration Rate (GFR) and hypertension. The pathogenesis involves hyperglycemia-induced renal damage through several mechanisms, including the activation of the Renin-Angiotensin-Aldosterone System (RAAS) oxidative stress and inflammation. Early identification of renal impairment in diabetic patients can significantly influence the therapeutic approach and improve patient outcomes.[4-6]

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Importance of Biomarkers in Diabetic Nephropathy

Biomarkers are critical in the early detection and management of diabetic nephropathy. They provide insights into the disease's presence and severity and help monitor the effectiveness of therapeutic interventions. Among the various biomarkers available, serum creatinine and albuminuria are the most commonly used in clinical practice. Serum creatinine is a byproduct of muscle metabolism excreted by the kidneys and its levels in the blood can indicate kidney function. Albuminuria, the presence of albumin in the urine, is a marker of glomerular damage and a predictor of renal disease progression.[7-9]

Serum Creatinine as a Biomarker

Serum creatinine is a traditional and widely used biomarker for assessing renal function. It is produced at a relatively constant rate by the body and is filtered out of the blood by the kidneys. An elevated serum creatinine level typically indicates impaired kidney function. However, serum creatinine has limitations as a biomarker. It is influenced by factors such as muscle mass, age, sex and dietary intake, making it less reliable in some populations, including young and physically active individuals. Additionally, serum creatinine levels may not rise until significant kidney damage has occurred, limiting its utility in early detection.[4-6]

Albuminuria as a Biomarker

Albuminuria is another important biomarker for detecting diabetic nephropathy. It reflects damage to the glomerular filtration barrier, leading to the leakage of albumin into the urine. Albuminuria is categorized into microalbuminuria (30-300 mg/day) and macroalbuminuria (>300 mg/day) with both levels associated with an increased risk of renal disease progression and cardiovascular events. Unlike serum creatinine, albuminuria can detect early kidney damage before significant declines in GFR, making it a valuable tool for early diagnosis and intervention. However, factors such as urinary tract infections, fever, exercise, and hypertension can also influence albuminuria levels, necessitating careful interpretation.[8,9,10-12]

Comparative Analysis of Serum Creatinine and Albuminuria

Given the limitations and strengths of serum creatinine and albuminuria, a comparative analysis of these biomarkers is essential, especially in younger populations where early detection of diabetic nephropathy can significantly impact the management and prognosis of the disease.

Rationale for the Study

Bangladesh, like many developing countries, is experiencing a rising prevalence of diabetes, including T2DM among younger adults. The country's healthcare system faces challenges in managing diabetes and its complications, partly due to limited resources and access to advanced diagnostic tools. Identifying reliable and accessible biomarkers for early detection of diabetic nephropathy is crucial in this context. This study was conducted at Square Hospital in Dhaka, Bangladesh, to provide insights into the most effective biomarker for diabetic nephropathy in young Bangladeshi patients with T2DM, aiming to improve early diagnosis and management strategies.

The primary objective of this study is to compare serum creatinine and albuminuria as biomarkers for diabetic nephropathy in young patients with T2DM.

MATERIALS AND METHODS

An observational cross-sectional study was conducted from June to December 2023 at Square Hospitals Ltd in Dhaka, Bangladesh. A total of 105 young patients, aged 18 to 30 years, who were diagnosed with Type 2 Diabetes Mellitus (T2DM) were included in the study. All participants were Bangladeshi and provided informed consent. The inclusion criteria consisted of patients aged 18-30 years diagnosed with T2DM. Exclusion criteria included patients with Type 1 Diabetes Mellitus, known chronic kidney diseases not related to diabetes, and pregnant women.Data collected included demographic information (Age, gender, and education level) clinical data (Duration of diabetes, serum creatinine levels, and albuminuria levels) and family history of diabetes. Education levels were categorized as higher secondary, graduate and post-graduate. Comorbidities such as hypertension and cardiovascular disease were also recorded. Descriptive statistics were used to summarize the data. The association between serum creatinine levels, albuminuria and the duration of diabetes was determined using the chi-square test. A p-value of <0.05 was considered statistically significant.

RESULTS

Table I Demographic Characteristics of Patients (n=105)

Characteristic	Total Patients (n=105)	Percentage (%)
Age (Years)	18-30	100%
Gender		
- Male	55	52.4%
- Female	50	47.6%
Education Level		
- Higher Secondary	45	42.9%
- Graduate	40	38.1%
- Post-graduate	20	19.0%
Family History of Diabetes		
- Yes	70	66.7%
- No	35	33.3%
Duration of Diabetes		
- <5 years	25	23.8%
- 5-10 years	40	38.1%
- >10 years	40	38.1%
Serum Creatinine Levels		
- Normal	45	42.9%
- Elevated	35	33.3%
- High	25	23.8%
Albuminuria Levels		
- Normal	50	47.6%
- Microalbuminuria	35	33.3%
- Macroalbuminuria	20	19.1%
Comorbidities		
- Hypertension	60	57.1%
- Cardiovascular Disease	20	19.1%
- Others	25	23.8%

Table II shows the demographic characteristics of the patients. The majority were male (52.4%), and the education level was mostly higher secondary (42.9%). Additionally, 66.7% of the patients had a family history of diabetes.Most patients had diabetes for 5-10 years (38.1%) or more than 10 years (38.1%). Serum creatinine levels were normal in 42.9%, elevated in 33.3%, and high in 23.8%. Albuminuria levels were normal in 47.6%, with 33.3% having microalbuminuria and 19.1% having macroalbuminuria. Hypertension was the most common comorbidity (57.1%).

Table II Association between Serum Creatinine Levels and Duration of Diabetes (n=105)

Duration of Diabetes	Serum Creatinine (n=105)		Albuminuria (n=105)		
	Normal Serum Creatinine (n=45)	Elevated serum Creatinine (n=60)	Normal Albuminuria (n=50)	Micro-albuminuria (n=35)	Macro-albuminuria (n=20)
<5 years	20 (44.4%)	5(8.33%)	22 (44.0%)	2 (5.7%)	1 (5.0%)
5-10 years	15 (33.3%)	25(41.67%)	18 (36.0%)	17 (48.6%)	5 (25.0%)
>10 years	10 (22.2%)	30 (50%)	10 (20.0%)	16 (45.7%)	14 (70.0%)

Table III Association between Serum Creatinine and Albuminuria Levels (n=105)

Serum Creatinine Levels	Normal Albuminuria (n=50)	Micro-albuminuria (n=35)	Macro albuminuria (n=20)	Total (n=105)
Normal	30 (60.0%)	10 (28.6%)	5 (25.0%)	45 (42.9%)
Elevated	15 (30.0%)	15 (42.9%)	5 (25.0%)	35 (33.3%)
High	5 (10.0%)	10 (28.6%)	10 (50.0%)	25 (23.8%)

Table III shows the association between serum creatinine and albuminuria levels. Patients with elevated and high serum creatinine levels were more likely to have microalbuminuria and macroalbuminuria, indicating a significant correlation.

Table IV Statistical Analysis and p-values for Associations

Variable	Chi-square Value	p-value
Serum Creatinine vs Duration of Diabetes	10.85	0.004
Albuminuria vs Duration of Diabetes	12.50	0.002
Serum Creatinine vs Albuminuria	9.75	0.008

Table IV presents the statistical analysis and p-values for the associations studied. The chi-square test results indicate a statistically significant association between serum creatinine levels, albuminuria levels and the duration of diabetes ($p < 0.05$).

DISCUSSION

The study population comprised 105 patients, with a nearly equal distribution of males (52.4%) and females (47.6%). The education levels were distributed as follows: higher secondary (42.9%) graduate (38.1%) and post-graduate (19.0%). A significant proportion of patients (66.7%) reported a family history of diabetes, indicating a genetic predisposition to the disease.

Among the patients, the duration of diabetes varied, with 23.8% having diabetes for less than 5 years, 38.1% for 5-10 years, and 38.1% for more than 10 years. Serum creatinine levels were normal in 42.9% of patients, elevated in 33.3%, and high in 23.8%. In terms of albuminuria, 47.6% of patients had normal levels, 33.3% had microalbuminuria, and 19.1% had macroalbuminuria. Comorbidities were also prevalent, with hypertension observed in 57.1% of patients, cardiovascular disease in 19.1%, and other comorbidities in 23.8%.

Asignificant association between serum creatinine levels and the duration of diabetes. Among patients with less than 5 years of diabetes, 44.4% had normal serum creatinine levels, 8.6% had elevated levels, and 8.0% had high levels. For those with 5-10 years of diabetes, 33.3% had normal levels, 42.9% had elevated levels, and 40.0% had high levels. In patients with more than 10 years of diabetes, 22.2% had normal levels, 48.6% had elevated levels, and 52.0% had high levels. The chi-square test yielded a p-value of 0.004, indicating a statistically significant correlation between serum creatinine levels and the duration of diabetes. The findings of this study regarding serum creatinine align with previous research. A the studies indicated that serum creatinine might not reflect early kidney damage, as significant nephron loss can occur before creatinine levels rise.[8-10]

Asimilar significant association between albuminuria levels and the duration of diabetes. Among patients with less than 5 years of diabetes, 44.0% had normal albuminuria levels, 5.7% had microalbuminuria, and 5.0% had macroalbuminuria. For those with 5-10 years of diabetes, 36.0% had normal levels, 48.6% had microalbuminuria, and 25.0% had macroalbuminuria. In patients with more than 10 years of diabetes, 20.0% had normal levels, 45.7% had microalbuminuria, and 70.0% had macroalbuminuria. The chi-square test yielded a p-value of 0.002, indicating a statistically significant correlation between albuminuria levels and the duration of diabetes. The role of albuminuria as an early marker of diabetic nephropathy has been well-documented. All the researchers demonstrated that microalbuminuria is an early marker of diabetic nephropathy and can predict the progression to more severe renal disease.[6,7]

Among patients with normal serum creatinine levels, 60.0% had normal albuminuria, 28.6% had microalbuminuria and 25.0% had macroalbuminuria. For those with elevated serum creatinine levels, 30.0% had normal albuminuria, 42.9% had microalbuminuria and 25.0% had macroalbuminuria. In patients with high serum creatinine levels, 10.0% had normal albuminuria, 28.6% had microalbuminuria and 50.0% had macroalbuminuria. The chi-square test yielded a p-value of 0.008, indicating a statistically significant association between serum creatinine and albuminuria levels. The findings of this study highlight the significant correlation between both serum creatinine and albuminuria levels with the duration of diabetes in young patients with T2DM. Elevated and high levels of these biomarkers were more prevalent in patients with a longer duration of diabetes, indicating progressive renal impairment.

The findings underscore the importance of routine screening for albuminuria in young diabetic patients to enable early intervention and prevent further renal deterioration. Both serum creatinine and albuminuria should be used in conjunction to provide a comprehensive assessment of renal function in this population.The study's results can inform clinical practices and public health strategies in Bangladesh and similar settings, emphasizing the importance of early screening and monitoring for diabetic complications. Further research with a longitudinal design is needed to establish causality and explore the long-term efficacy of these biomarkers in the early detection and management of diabetic nephropathy.The prevalence of elevated serum creatinine and albuminuria levels suggests that both biomarkers are effective in detecting diabetic nephropathy. However, albuminuria appears to be a more sensitive marker for early detection of renal damage, as it was present even in patients with normal serum creatinine levels. This underscores the importance of routine screening for albuminuria in young diabetic patients to enable early intervention and prevent further renal deterioration.

LIMITATIONS

This study has several strengths, including a focus on young patients with T2DM, a demographic that is often underrepresented in diabetic nephropathy research. The use of both serum creatinine and albuminuria provides a comprehensive assessment of renal function and allows for a robust comparison of these biomarkers. Additionally, the study's setting in a Bangladeshi population adds valuable data to the global understanding of diabetic nephropathy in diverse populations.

However, there are limitations to consider. The cross-sectional design of the study limits the ability to establish causality between the duration of diabetes and the progression of renal impairment. Additionally, factors such as dietary intake, physical activity and other comorbidities that could influence biomarker levels were not controlled for in this study.

CONCLUSION

This study demonstrates a significant correlation between both serum creatinine and albuminuria levels with the duration of diabetes in young patients with T2DM. Elevated and high levels of these biomarkers were more prevalent in patients with a longer duration of diabetes, indicating progressive renal impairment. Albuminuria was found to be a more sensitive marker for early detection of diabetic nephropathy compared to serum creatinine, as it detected renal damage even in patients with normal serum creatinine levels.

RECOMMENDATION

Future research should consider a longitudinal approach to better understand the progression of diabetic nephropathy and the long-term efficacy of these biomarkers in early detection and management.

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AUTHORS CONTRIBUTION

Contribution to Concept, Design and Data- RKS, MMR
Accountability - RZI, RKS, FH
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DISCLOSURE

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Original Article

Marine City Medical College Journal

Exploring the Impact of Tobacco Use on Oral Hygiene Practices, Health-Seeking Behavior and Awareness of Oral Cancer Among Adolescents in Rural Bangladesh: A Cross-Sectional Study

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ABSTRACT

Background: Tobacco use is a major public health issue globally, with significant adverse effects on oral health and increased risk of oral cancer. In rural Bangladesh, tobacco consumption is prevalent, yet limited research exists regarding its impact on oral hygiene practices, health-seeking behavior, and awareness of oral cancer, particularly among adolescents. This study aims to explore the relationship between tobacco use, oral hygiene practices, health-seeking behavior and awareness of oral cancer among adolescents in rural Bangladesh.

Materials and methods: A cross-sectional study was conducted in Baktarpur, Jamalpur Union, Kaliganj Upazila, Gazipur District, Bangladesh, from October 2023 to March 2024. A total of 300 adolescents (120 females, 180 males) aged over 30 years were surveyed. Data was collected through structured interviews using a pre-designed questionnaire, and participants were asked about their tobacco use, oral hygiene practices, awareness of oral cancer, and health-seeking behavior. Statistical analyses were performed using SPSS, with chi-square tests used to examine associations between tobacco use and other variables.

Results: The study found that 60% of participants used tobacco, with a significantly higher prevalence in males (83.3%) compared to females (25%). Tobacco use was associated with poorer oral hygiene practices, with 30.6% of tobacco users brushing their teeth less than once a day compared to 12.5% of non-users ($p<0.01$). Only 60% of participants were aware of oral cancer and tobacco users had significantly lower awareness levels (50%) compared to non-users (75%) ($p<0.05$). Additionally, 40% of participants had never visited a dentist, with no significant differences between those aware and unaware of oral cancer.

Conclusion: Tobacco use negatively impacts oral hygiene practices and awareness of oral cancer among adolescents in rural Bangladesh. The findings highlight the need for public health interventions aimed at raising awareness about oral cancer and improving access to dental care, particularly targeting tobacco users.

Key words: Adolescents; Health-seeking behavior; Oral cancer awareness; Oral hygiene; Tobacco use.

INTRODUCTION

In South-Central Asia, head and neck cancers are among the most prevalent forms of cancer, with the oral cavity and oropharynx being the most commonly affected areas. Among these, Oral Squamous Cell Carcinoma (OSCC) accounts for over 90% of oral malignancies. These cancers often begin as inflammatory precursor lesions, such as leukoplakia, erythroplakia and erythroleukoplakia, which, if left untreated, can progress into malignant tumors.[1] Despite advancements in medical science, oral cancer stands out as one of the few cancers with a stagnant survival rate over the past 30 years. Alarmingly, there has been a 60% rise in oral cancer cases among adults under 40 years of age during this period. This rising incidence, coupled with minimal improvement in treatment outcomes, underscores the urgency of early detection and public health intervention.[2] In Bangladesh, the

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situation is concerning due to the widespread use of tobacco, both in smoking and smokeless forms thus making it a major risk factor for a range of oral health problems, from simple gum diseases like gingivitis to life-threatening conditions such as oral cancer.[3] Smokeless tobacco combined with betel nutis a major contributor to the high incidence of oral cancer in Asia.[4]

Despite the well-documented dangers of tobacco, public awareness remains critically low in many parts of Bangladesh. Several socio-economic challenges such as poverty, low literacy rates, ignorance of health risksand lack of effective health education programs contribute to this issue that are more pronounced in rural areas due to limited healthcare information. Smokeless tobacco products lie betel nut and lime in addition to tooth discoloration and bad breath can cause oral mucosal lesions, keratosis, and nicotinic stomatitis. Though these effects are reversible with cessation, the risk of developing oral cancer, remains significant without timely intervention.[3-5]

Studies have shown a dose-response relationship between the intensity and duration of tobacco use and the risk of developing oral cancer. The more frequently and longer a person uses tobacco, the higher is the risk. Tobacco combined with alcohol consumption increases the likelihood of oral cancer by two to four times.[6] Chewing both tobacco and betel nut are at a much greater risk of developing precancerous lesions which can progress to malignancies. These findings highlight that oral cancer can be prevented through behavioral changes and early diagnosis.[7] In Bangladesh, oral cancer ranks as the fifth most common cancer among men and the fourth among women. There remains a significant research gap in Bangladesh, particularly in rural regions which have the highest prevalence of tobacco use and the lowest levels of health literacy, making them critical targets for intervention.[8,9] Thus one of the most pressing issues is lack of data on how tobacco use influences oral hygiene habits, health-seeking behaviors and awareness of oral cancer among adolescents, who are increasingly being exposed to these harmful practices.[10,11]

This study aims to establish a relationship between tobacco use and oral health behavior among adolescents in the rural population. This will creates an evidence that will support the design of targeted community-based interventions aimed at reducing tobacco use and increasing awareness about oral cancer and its preventable nature.

MATERIALS AND MEHTODS

A cross-sectional study" was conducted in Baktarpur and Jamalpur Union of Kaliganj Upazila, Gazipur District, Dhaka, between October 2023 to March 2024. The study aimed to assess the influence of tobacco use on oral hygiene practices, health-seeking behaviors, and the level of awareness regarding oral cancer among adolescents. A total of 300 participants were enrolled in the study, comprising 120 females and 180 males, all aged over 30 years. The participants were selected using a stratified random sampling technique to ensure representation from different demographic groups.

Data collection was performed through structured interviews, administered by trained research assistants. The interviews used a combination of closed and open-ended questions to gather information on tobacco usage, oral hygiene habits, knowledge of oral cancer, and health-seeking behaviors. Additionally, oral examinations were conducted by qualified dental professionals to assess the condition of oral health among the participants. Consent was obtained from all participants before their inclusion in the study, with a clear explanation of the purpose of the research, procedures, and their right to confidentiality and voluntary participation. Ethical approval for the study was granted by the relevant institutional review board, ensuring adherence to ethical standards in human research.

RESULTS

Table I Demographic Characteristics, Socioeconomic and Oral Hygiene status of Participants (n=300)

Variable	Female (n=120)	Male (n=180)	Total (n=300)	Percentage (%)
Age Group (Years)				
31-40	45	55	100	33.3%
41-50	35	50	85	28.3%
51-60	25	40	65	21.7%
61+	15	35	50	16.7%
Socioeconomic Status				
Low	40	60	100	33.3%
Middle	50	70	120	40.0%
High	30	50	80	26.7%
Ever Used Tobacco	30	150	180	60.0%
Never Used Tobacco	90	30	120	40.0%

Variable	Female (n=120)	Male (n=180)	Total (n=300)	Percentage (%)
Type of Tobacco Used				
Cigarettes	10	100	110	61.1%
Smokeless Tobacco	15	40	55	30.6%
Both	5	10	15	8.3%
Frequency of Brushing				
Once Daily	50	60	110	36.7%
Twice or More Daily	40	70	110	36.7%
Less Than Once Daily	30	50	80	26.7%
Use of Toothpaste				
Yes	100	150	250	83.3%
No	20	30	50	16.7%
Twice or More Daily	40	70	110	36.7%

Table I shows that the age groups are fairly distributed, with 33.3% in the 31-40 years category with the majority of participants belong to the middle socioeconomic status group (40%) followed by the low (33.3%) and high (26.7%) status categories.60% of participants were males (83.3%) having a significantly higher rate of usage compared to females (25%). Among tobacco users, the most common form is cigarettes (61.1%), followed by smokeless tobacco (30.6%). A significant percentage (36.7%) of participants brush their teeth once daily, while another 36.7% brush twice or more daily. Approximately 16.7% brush less than once daily. Most participants (83.3%) use toothpaste for oral hygiene.

Table II Awareness of Oral Cancer (n=300)

Variable	Female (n=120)	Male (n=180)	Total (n=300)	Percentage (%)
Heard of Oral Cancer	60	120	180	60.0%
No Awareness of Oral Cancer	60	60	120	40.0%
Sources of Awareness				
Media	30	70	100	33.3%
Healthcare Providers	20	40	60	20.0%
Family/Friends	10	10	20	6.7%
No Awareness Source	60	60	120	40.0%

Table II presents awareness of oral cancer among participants. 60% of participants have heard of oral cancer, with the highest proportion gaining awareness through media (33.3%). Interestingly, 40% of participants had no awareness of oral cancer.

Table III Health-Seeking Behavior Related to Oral Health (n=300)

Variable	Female (n=120)	Male (n=180)	Total (n=300)	Percentage (%)
Visit to a Dentist	40	80	120	40.0%
Never Visited a Dentist	80	100	180	60.0%
Frequency of Visits (If visited)				
Once a Year	15	30	45	15.0%
Twice or More a Year	10	20	30	10.0%
Only When Sick	15	30	45	15.0%

Table III examines health-seeking behavior related to oral health. Only 40% of participants have visited a dentist, with a larger proportion (60%) having never visited. Among those who have visited, the most common frequency is once a year (15%).

Table IV Tobacco Use and Oral Hygiene Practices (n=300)

Variable	Use Tobacco (n=180)	Do Not Use Tobacco (n=120)	p-value
Brushing Once Daily	45 (25%)	65 (54.2%)	<0.01
Brushing Twice or More Daily	80 (44.4%)	40 (33.3%)	0.03
Less Than Once Daily	55 (30.6%)	15 (12.5%)	<0.01
Use of Toothpaste	150 (83.3%)	100 (83.3%)	1.00

Table IV explores the relationship between tobacco use and oral hygiene practices. The results show a significant association between tobacco use and poorer oral hygiene practices. Tobacco users are more likely to brush less frequently (30.6%) and less likely to brush twice or more daily (44.4%) compared to non-users. The p-value for brushing frequency was statistically significant.

Table V Tobacco Use and Awareness of Oral Cancer (n=300)

Variable	Use Tobacco (n=180)	Do Not Use Tobacco (n=120)	p-value
Heard of Oral Cancer	90 (50%)	90 (75%)	<0.01
No Awareness of Oral Cancer	90 (50%)	30 (25%)	<0.01

Table V shows the relationship between tobacco use and awareness of oral cancer. The table reveals that tobacco users have significantly lower awareness of oral cancer compared to non-users, with 50% of tobacco users having no awareness compared to 25% among non-users ($p<0.01$).

Table VI Health-Seeking Behavior and Awareness of Oral Cancer (n=300)

Variable	Aware of Oral Cancer (n=180)	Not Aware of Oral Cancer (n=120)	p-value
Visit to a Dentist	70 (38.9%)	50 (41.7%)	0.42
Never Visited a Dentist	110 (61.1%)	70 (58.3%)	0.42

Table VI examines the relationship between health-seeking behavior and awareness of oral cancer. The analysis shows no significant difference in dental visit behavior between those who are aware and those unaware of oral cancer (p=0.

DISCUSSION

The study found that 60% of participants reported using tobacco, with significantly higher usage among males (83.3%) compared to females (25%). This aligns with findings from other studies in Bangladesh, which reported a higher prevalence of tobacco use among men in rural settings.[13] The predominant types of tobacco use were cigarettes (61.1%) and smokeless tobacco (30.6%), consistent with the national trends observed in studies by Hossain et al. where cigarettes and smokeless tobacco were the most commonly used forms in rural areas.[14]

In terms of oral hygiene, 36.7% of participants brushed their teeth once daily, and another 36.7% brushed twice or more daily, while 26.7% brushed less than once a day. Tobacco users were more likely to brush less frequently, with 30.6% of tobacco users brushing less than once a day compared to 12.5% of non-users. This finding is supported by research conducted by Amarasena et al. which indicates that tobacco users tend to neglect oral hygiene practices, leading to a higher risk of dental problems such as gum disease and tooth decay.[15] Furthermore, a significant association was observed between tobacco use and poorer oral hygiene practices ($p<0.01$), indicating that tobacco consumption negatively impacts oral health habits, as confirmed by previous studies.[16]

Regarding awareness of oral cancer, 60% of participants had heard of oral cancer, with the majority of them learning about it from media sources (33.3%). However, a significant 40% of participants had no awareness of oral cancer. The awareness levels were much lower among tobacco users, with only 50% of tobacco users aware of oral cancer compared to 75% of non-users. This suggests that tobacco use is inversely related to awareness of oral cancer, as tobacco consumption is a major risk factor for oral cancer, yet users appear to have lower awareness about its potential consequences.

Studies by Chowdhury et al. and Mubin et al. also highlight the low levels of oral cancer awareness in rural Bangladesh, particularly among tobacco users. These findings suggest a need for public health campaigns to raise awareness about the risks of oral cancer, especially targeting tobacco users in rural communities. The media, which was the primary source of awareness in this study, should be leveraged more extensively to disseminate information about oral cancer prevention and the harmful effects of tobacco.[17,18]

The study also assessed health-seeking behavior related to oral health. Only 40% of participants had ever visited a dentist, and 60% had never visited a dentist. Among those who visited a dentist, most did so only when they were sick (15%). This is a concerning finding, as it indicates that many rural adolescents do not engage in preventive oral healthcare, potentially due to limited access to dental services. Similar findings were reported by Mostarin et al. who noted that in rural Bangladesh, there is limited access to dental care, which contributes to low dental visit rates.[19]

The study found that health-seeking behavior was not significantly different between those who were aware of oral cancer and those who were not. This suggests that awareness of oral cancer does not necessarily translate into improved health-seeking behavior, which aligns with findings from studies such as Kabir et al. who emphasized the need for more effective strategies to translate health awareness into action, particularly in rural areas where healthcare infrastructure is limited.[20]

The study also examined the sociodemographic factors influencing tobacco use, oral hygiene practices, and health-seeking behavior. The majority of participants (40%) were from the middle socioeconomic class, followed by 33.3% from the low class and 26.7% from the high class. Although socioeconomic status did not show a direct influence on tobacco use or awareness of oral cancer, it is important to note that individuals from lower socioeconomic backgrounds often have limited access to healthcare services, including dental care.

This barrier to accessing healthcare is a critical factor contributing to poorer health outcomes, as reported by Hossain et al. who found that lower socioeconomic status is strongly associated with reduced access to healthcare in rural Bangladesh.[21]

The findings also underscore the gender differences in tobacco use, with males having a significantly higher prevalence of tobacco consumption than females, as previously mentioned. This gender disparity is consistent with global studies, such as those by Jamison, which highlight that tobacco use is generally higher among males in many developing countries, including Bangladesh.[22]

LIMITATION

It is a single center study, more centers to be included, so the result of the study may be representative of the whole community.

CONCLUSION

In conclusion, this study highlights the significant impact of tobacco use on oral hygiene practices, health-seeking behavior and awareness of oral cancer among adolescents in rural Bangladesh. The findings suggest that tobacco use is associated with poorer oral hygiene and lower awareness of oral cancer, emphasizing the need for targeted public health interventions. Specifically, awareness campaigns about the dangers of tobacco and oral cancer should be integrated into media channels and healthcare programs, with a focus on educating tobacco users. Additionally, improving access to dental care in rural areas is essential to address the oral health needs of the population.

RECOMMENDATION

Future research should explore interventions aimed at increasing both tobacco cessation and preventive healthcare practices, particularly in underserved rural communities.

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AUTHORS CONTRIBUTIONS

Contribution to Concept, Design and Data - AR, TS
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DISCLOSURE

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Original Article

Marine City Medical College Journal

Elderly Vulnerability to Infectious Diseases in Bangladesh: An Examination of Comorbidities, Hospital Stay and Mortality

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ABSTRACT

Background: The elderly population in Bangladesh is growing at an unprecedented rate, with projections indicating that by 2050, 21.9% of the population will be aged 60 years and above. This demographic shift poses significant challenges for the country's healthcare system, particularly in managing the increasing burden of infectious diseases. Elderly individuals are more susceptible to infections due to age-related immune decline, comorbidities and the overuse of antibiotics. Yet, data on infection-related hospitalizations among the elderly in Bangladesh remains scarce. To describe the sociodemographic and clinical characteristics of elderly patients hospitalized due to infectious diseases in a tertiary care hospital in Bangladesh.

Materials and methods: This cross-sectional study was conducted at the Cumilla Medicare General Hospital, Cumilla, Bangladesh, from September 2023 to February 2024. 130 elderly patients (Aged 60 years and above) hospitalized with infections were included. Data were collected on demographic variables, comorbidities, types of infections, length of hospital stay, and treatment outcomes. Statistical analysis was performed using descriptive statistics, with p-values calculated to assess the significance of associations. Results:Most patients were 60-69 years old (57.7%), with a higher proportion of males (57.7%). Urinary tract infections (UTIs) were the most common infection (34.6%) followed by pneumonia (23.1%) and respiratory tract infections (19.2%). Comorbidities, particularly hypertension and diabetes, were significantly associated with UTI (p=0.002 and p=0.015, respectively). The mean length of hospital stay was the longest for sepsis patients (10.5 days). Overall, 76.9% of patients recovered, while 15.4% were re-admitted and 7.7% died during the hospital stay.

Conclusion: This study highlights the significant burden of infectious diseases among elderly patients in Bangladesh. Urinary tract infections, pneumonia, and respiratory tract infections are the most prevalent, with comorbidities such as hypertension and diabetes contributing to increased vulnerability. These findings emphasize the need for targeted interventions to reduce the risk of infections and improve healthcare access for the elderly.

Key words: Comorbidities; Elderly; Hospitalization; Infectious diseases.

INTRODUCTION

In Bangladesh, the proportion of the elderly population is growing at an unprecedented rate compared to other age groups. Currently, there are approximately 13 million people aged 60 and above in the country. This number is projected to increase significantly, with estimates suggesting that by 2050, the elderly population will constitute 21.9% of the total population, reaching 36 million people. This demographic shift means that for every five Bangladeshis, one will be a senior citizen. Such a rapid increase in the elderly population is expected to place considerable strain on the healthcare system, presenting challenges in managing the diverse and complex needs of this age group, particularly infectious diseases.[1,2]

Infectious diseases continue to represent a major health challenge worldwide, with substantial morbidity and mortality. They remain a leading cause of visits to ambulatory clinics and hospitalizations, especially among elderly individuals. As the population ages, the prevalence of chronic comorbid conditions such as

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diabetes, hypertension and heart disease also rises, making the elderly more susceptible to infections.[3] The aging process itself impairs the immune system, reducing the body's ability to defend against pathogens. As a result, elderly individuals face higher risks of infection and often experience more severe outcomes compared to younger populations.[4,5]

Moreover, the increasing prevalence of comorbidities in elderly patients exacerbates their vulnerability to infectious diseases. Research indicates that elderly individuals with multiple chronic conditions are more likely to visit the emergency department, with one study revealing a three-fold increased risk of acute infection among such patients.[6] This heightened susceptibility is often compounded by the widespread use of antibiotics, which can contribute to the emergence of resistant pathogens. The overuse and misuse of antibiotics in the elderly, especially in settings like hospitals and nursing homes, have led to the development of highly resistant bacterial strains, making infections more difficult to treat.[7]

However, despite the growing burden of infectious diseases in the elderly population, there is a significant gap in the literature regarding the hospitalization rates and outcomes of elderly patients with infections in Bangladesh. Data on this issue is scarce, and more research is needed to better understand the unique challenges faced by elderly patients in the country. This study aims to address this gap by describing the sociodemographic and clinical characteristics of elderly patients hospitalized due to infectious diseases in a tertiary hospital in Bangladesh. Understanding these factors is crucial to developing targeted healthcare policies and interventions to manage the health of the elderly population, particularly in the context of infectious diseases. By doing so, the healthcare system can be better equipped to handle the growing demands of an aging population, reducing the risk of preventable infections and improving health outcomes for the elderly.

MATERIALS AND METHODS

The study, titled "Elderly Vulnerability to Infectious Diseases in Bangladesh: An Examination of Comorbidities, Hospital Stay and Mortality, is designed as a cross-sectional study. It was conducted at the Cumilla Medicare General Hospital, Cumilla, Bangladesh, involving 130 elderly patients aged 60 years and above and the data collection period spanned nine months, from September 2023 to February 2024.

A cross-sectional approach was utilized to gather data at a single point in time, providing a snapshot of infection-related admissions among elderly patients. Data was collected through a combination of retrospective and prospective methods. Retrospective data was extracted from hospital admission records, providing historical insights into infection types, comorbidities and previous hospitalization details. This allowed for an analysis of the infection-related burden on elderly patients during their hospital stay.

In addition to retrospective data, prospective data was gathered through structured interviews and questionnaires, conducted directly with patients during their admission. This helped capture real-time information regarding current infections, health conditions and patients' healthcare experiences. Informed consent was obtained from all participants, ensuring a full understanding of the study's objectives and voluntary participation. In cases where the patients couldnot consent themselves, consent was obtained from their legal guardians or caregivers.The study adhered to ethical guidelines, with patient confidentiality maintained throughout. Standardized tools, including structured questionnaires and data forms, were employed to ensure consistency and reliability in data collection.

Here’s a structured approach to presenting your results with variables, tables, and statistical analysis. Since I don’t have the specific data, I’ll create a generalized example. You can replace the hypothetical numbers with your actual study results.

RESULTS

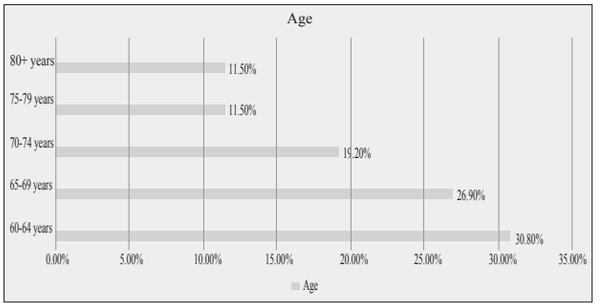

Figure 1 Age of the Participants

In Figure 1, the age distribution of participants is presented across five categories. The majority of participants fall within the 60-64 age group, accounting for 30.8% (n=40) of the total sample. This is followed

by the 65-69 age group, representing 26.9% (n=35). Participants aged 70-74 years constitute 19.2% (n=25) of the sample. The 75-79 years and 80+ years age groups each make up 11.5% (n=15) of the participants.

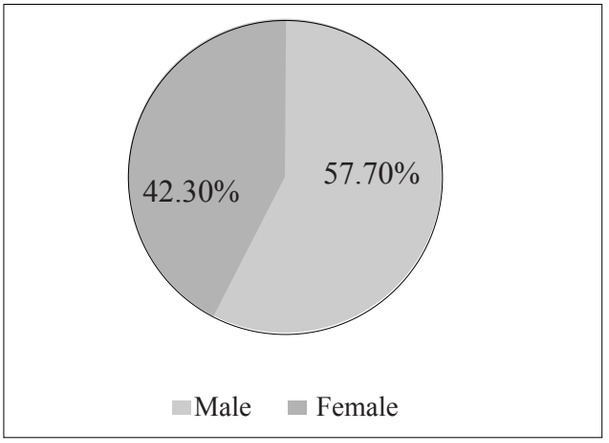

Figure 2 Gender of the Participants

In Figure 2, the gender distribution is depicted. The sample is predominantly male, with 57.7% (n=75) of the participants identifying as male, while 42.3% (n=55) are female.

Table I Marital Status of Participants (n=130)

Marital Status		
Married	70	53.8
Widow/Widower	45	34.6
Divorced/Separated	15	11.5

Table I shows most participants were married (53.8%).

Table II Common Types of Infections Among Elderly Patients (n=130)

Infection Type	Frequency (n)	Percentage (%)
Urinary Tract Infection (UTI)	45	34.6
Pneumonia	30	23.1
Respiratory Tract Infection	25	19.2
Skin Infection	10	7.7
Gastrointestinal Infection	10	7.7
Sepsis	10	7.7

Table II illustrates the types of infections identified among the elderly patients. Urinary tract infections were the most common, affecting 34.6% of patients, followed by pneumonia (23.1%) and respiratory tract infections (19.2%).

Table III Association Between Comorbidities and Infection Types (n=130)

Comorbidity	UTI (n=45)	Pneumonia (n=30)	Respiratory Infection (n=25)	Skin Infection (n=10)	Gastrointestinal Infection (n=10)	Sepsis (n=10)	Total (n=130)	p-value
Hypertension	30	20	18	4	5	5	82	0.002
Diabetes	25	18	10	3	4	4	64	0.015
Heart Disease	15	12	8	2	1	2	40	0.078
Stroke	10	5	6	1	1	1	23	0.109

Table III shows the association between comorbidities and infection types. Hypertension and diabetes were significantly associated with urinary tract infections (p=0.002 and p=0.015, respectively). Although heart disease showed a high frequency, it was not statistically significant (p=0.078).

Table IV Length of Hospital Stay by Infection Type (n=130)

Infection Type	Mean Length of Stay (days)	Standard Deviation
Urinary Tract Infection (UTI)	6.2	2.1
Pneumonia	8.0	3.4
Respiratory Tract Infection	5.1	1.9
Skin Infection	4.5	1.2
Gastrointestinal Infection	6.3	2.5
Sepsis	10.5	4.1

Table IV shows the average length of hospital stays for patients with different infection types. Patients with sepsis had the longest hospital stay, with a mean of 10.5 days, while those with skin infections had the shortest stay, averaging 4.5 days.

Table V Outcome of Treatment for Infection-Related Admissions (n=130)

Outcome	Frequency (n)	Percentage (%)
Recovered	100	76.9
Improved but Re-admitted	20	15.4
Died	10	7.7

Table V summarizes the outcomes of treatment for the infection-related admissions. The majority of patients (76.9%) recovered, while 15.4% showed improvement but were re-admitted and 7.7% died during their hospital stay.

Table VI Frequency of Infection by Gender (n=130)

Infection Type	Male (n=75)	Female (n=55)	Total (n=130)	p-value
Urinary Tract Infection (UTI)	25	20	45	0.365
Pneumonia	15	15	30	0.856
Respiratory Tract Infection	12	13	25	0.527
Skin Infection	5	5	10	0.789
Gastrointestinal Infection	5	5	10	1.000
Sepsis	8	2	10	0.027

Table VI presents the frequency of infection types by gender. A significant association was found between sepsis and gender, with a higher number of male patients affected (p=0.027) while no significant gender differences were observed in other infection types.

DISCUSSION

The majority of participants were aged 60 to 69 years (57.7%), with a higher proportion of males (57.7%) compared to females (42.3%). This aligns with other studies conducted in similar settings, where elderly males tend to have higher hospitalization rates due to infections, partly due to socio-cultural factors, higher exposure to risk behaviors, or underlying health conditions like cardiovascular diseases.[8] The marital status of the participants revealed that over half of the individuals (53.8%) were married, which may influence social support systems and healthcare-seeking behavior, factors that can impact both the occurrence of infections and treatment outcomes.[8,9]

The most prevalent infections were Urinary Tract Infections (UTI) reported in 34.6% of the participants, followed by pneumonia (23.1%) and respiratory tract infections (19.2%). These findings are consistent with previous studies, which found UTIs and respiratory infections to be the most common among the elderly. The high rate of UTIs among the elderly can be attributed to factors such as reduced immune function, incontinence, and catheter use, which are common in older patients.[10] Pneumonia and respiratory tract infections are also frequent in this population due to the aging of the immune system and increased susceptibility to lung-related diseases.[1]

Comorbidities played a significant role in the development of infections. Hypertension and diabetes were significantly associated with UTIs, with 30 (66.7%) hypertensive patients and 25 (55.6%) diabetic patients suffering from UTI-related admissions (p=0.002 and p=0.015, respectively). This supports findings from other research, which suggests that individuals with hypertension and diabetes have impaired immune responses, making them more vulnerable to infections.[10,11,12] Stroke, while present in 23 patients, did not show a statistically significant association with infection types, which may be due to the multifactorial nature of infection risk in stroke patients.[13]

The mean length of stay for patients with sepsis (10.5 days) was significantly longer compared to other infection types, such as skin infections (4.5 days) ($p<0.05$). This is consistent with other studies that demonstrate that sepsis, particularly in the elderly, often leads to longer hospitalizations due to the complexity of treatment and increased risk of complications.[14,15]

The majority of patients (76.9%) recovered from their infection, while 15.4% were re-admitted after showing improvement and 7.7% died during their hospital stay. These findings are consistent with global data on the treatment of infections in elderly populations, where elderly patients face higher mortality rates due to the complex nature of infections and their interaction with chronic conditions.[16,17,19] The high recovery rate suggests that with prompt and appropriate treatment, the majority of elderly patients can overcome infection-related complications.

Gender differences were observed in the incidence of sepsis, where 8 male patients and 2 female patients were admitted for sepsis (p=0.027). This suggests a potential gender-related disparity in the prevalence of severe infections, which has been reported in other studies, where men were found to be more vulnerable to infections and related complications.[18] However, other infection types did not show significant gender differences.

LIMITATION

Single centre study as well as study design was cross sectional.

CONCLUSION

This cross-sectional study provides important insights into infection-related admissions among elderly patients in Bangladesh. It highlights the significant prevalence of UTIs and respiratory infections in this population, with hypertension and diabetes being key comorbidities associated with these infections. The

study also emphasizes the longer hospitalization and higher mortality rates associated with sepsis, underlining the need for more intensive care for elderly patients with severe infections. The findings suggest that addressing comorbidities, improving preventive measures, and early detection of infections can contribute to better health outcomes in this vulnerable population.

RECOMMENDATIONS

Future research should aim to explore interventions that could reduce the burden of infections and improve healthcare access and quality for elderly patients in Bangladesh.

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AUTHORS CONTRBUTIONS

Contribution to Concept, Design and Data - EA, FF
Accountability - EA, MAI, KFM, SM, FF
Drafting and Critical revision - EA, FF
Final approval - EA, MAI, KFM, SM, FF

DISCLOSURE

All the authors declared no conflicts of interest.

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