Centre for Medical Education Journal
ISSN: 2959-572X
DOI: https://doi.org/10.3329/cmej.v4i2. 84276

Vol.-4, Issue-02, July, 2025

Original Article

Clinical and epidemiological profile of a Hepatitis A outbreak among medical students at Shaheed Ziur Rahman Medical College hostel: A cross-sectional study

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Abstract

Background: Hepatitis A virus (HAV) continues to be a significant public health concern, causing acute viral hepatitis outbreaks, particularly in South Asia's overcrowded settings characterized by suboptimal sanitation. In late 2023, a cluster of jaundice cases emerged among residents of the Shaheed Ziaur Rahman Medical College (SZMC) hostel in Bogura, prompting a detailed epidemiological investigation.

Objectives: To investigate the clinical and epidemiological features of the outbreak, identify the source and modes of transmission, assess existing preventive measures, and propose evidence-based strategies for future risk mitigation.

Methods: A descriptive cross-sectional study was conducted from January to June 2025 to investigate the outbreak that occurred in late 2023. Cases were defined as students residing in the hostel with clinical signs of acute hepatitis and laboratory-confirmed IgM anti-HAV positivity via ELISA (98.9% sensitivity, 99.4% specificity). A structured questionnaire captured demographic, clinical symptom, water and food consumption habits, and personal hygiene data. An environmental survey of the hostel's water sources and sanitation infrastructure was conducted to identify potential contamination points.

Results: A total of 22 confirmed HAV cases were identified. The affected population comprised 62.1% male and 37.9% female students. The mean age of the confirmed students was 23.1 years (SD ±1.1). Common symptoms included jaundice (100%, n=22), fatigue (95.2%, n=21), anorexia (85.7%, n=19), and nausea/vomiting (81%, n=18). Epidemiological investigation revealed a strong association with specific risk factors: a majority of students (77%, n=17) reported consuming water from a tube well found to be adjacent to a cracked underground sewage pipe with evidence of leakage. Furthermore, the college canteen was identified as a highly probable common food source, with 72% (n=16) of affected students reporting consumption from it, and observations noted unhygienic conditions. Suboptimal hygiene practices, including inconsistent hand-washing (only 33.3%, n=7) of students reported consistent hand-washing before meals), were common, and none of the affected students had received HAV vaccination.

Conclusion: The outbreak was most likely a common-source event caused by fecal contamination of the hostel water supply, further amplified by unhygienic conditions in the college canteen and poor personal hygiene practices in communal areas. Targeted interventions, including water source repair, hygiene promotion, and health education, are crucial for effective control. Regular monitoring of water systems, sustained public health awareness campaigns, and consideration of HAV vaccination in high-risk communal settings are strongly recommended for preventing future outbreaks.

Keywords: Hepatitis A virus, waterborne outbreak, hostel, Bangladesh, IgM anti-HAV, contaminated water, vaccination, public health

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Introduction:

Hepatitis A virus (HAV), a non-enveloped RNA virus from the Picornaviridae family, remains a leading cause of acute viral hepatitis worldwide, particularly in low-resource settings where sanitation and hygiene conditions are inadequate. The World Health Organization (WHO) continues to emphasize HAV as a significant public health concern, even in its 2023 publications, highlighting the need for ongoing vigilance and effective control measures globally[1]. The 14th edition of the Epidemiology and Prevention of Vaccine-Preventable Diseases by the Centers for Disease Control and Prevention (CDC), published in 2021, offers an in-depth overview of HAV, its epidemiology, and strategies for prevention, serving as a key resource for public health professionals[2].

In endemic regions such as South Asia, HAV is primarily transmitted through the fecal–oral route, with the highest infection rates occurring in early childhood. These early exposures typically result in asymptomatic infections, which confer long-term immunity[2]. A landmark study by Jacobsen and Wiersma in 2010 on HAV seroprevalence by age and world region provided valuable insights into the global distribution of immunity. The study highlighted how early childhood exposure in highly endemic regions leads to high seroprevalence rates in older age groups[3]. This research also clarified the varying epidemiological patterns of HAV across different regions, distinguishing between high, intermediate, and low endemicity settings based on the age at which individuals typically acquire immunity[3].

This demographic shift represents a significant public health concern, as it directly correlates with increased severity in clinical manifestations among older individuals, who tend to experience more pronounced symptoms and face a higher risk of complications compared to their younger counterpart [4,5]. Moreover, this changing epidemiology significantly elevates the potential for large-scale outbreaks, especially in communal living settings such as hostels, prisons, and military barracks, where proximity and shared facilities create an ideal environment for the rapid spread of the virus [3,6].

Another study on hepatitis A and E virus seroprevalence in rural Bangladesh provided valuable insights into the ongoing childhood exposure in the region, revealing a rural-urban divide in epidemiological patterns[6]. This study served as a crucial benchmark for understanding HAV prevalence in transitional countries like Bangladesh, highlighting that while childhood exposure remains common in rural areas, the epidemiological landscape is evolving. This shift presents a challenge in preventing outbreaks among older, more vulnerable populations.

Bangladesh is currently navigating a transitional epidemiological landscape, shifting from a highly endemic to an intermediate endemic status for HAV[6]. While childhood exposure remains widespread, particularly in rural areas where sanitation infrastructure is still developing, there is an increasing emergence of symptomatic adult cases in urban and semi-urban regions[7] This shift highlights the urgent need for tailored public health interventions aimed at adolescent and adult populations, who are now more susceptible to symptomatic and potentially severe HAV infections[7]. University hostels represent high-risk environments for HAV transmission due to a convergence of multiple predisposing factors. Overcrowding, shared water sources, and inconsistent hygiene practices among residents collectively create a favorable environment for the rapid spread of the virus once introduced[8,9]. The communal nature of these living arrangements further facilitates close contact, promoting efficient person-to-person transmission, while shared amenities increase the risk of indirect spread through contaminated surfaces or water[10].

The understanding of Hepatitis A virus (HAV) has significantly advanced over the years, with critical contributions from historical research. While disease outbreaks resembling hepatitis A have been known since antiquity, it was not until World War II that two distinct forms of viral hepatitis were clearly differentiated. The pivotal shift in the search for HAV occurred after the identification of the Australia antigen associated with hepatitis B. Researchers eventually changed their focus from serum to faeces and applied newer technologies, leading to the successful identification of the virus[11].

This breakthrough laid the foundation for the development of diagnostic tools and vaccines and continues to support subsequent epidemiological studies and public health interventions targeting HAV.

Further insights into the disease's natural history and prevention were provided by another review on "Hepatitis A: Epidemiology, natural history, and prevention" in the Indian Journal of Gastroenterology. This comprehensive review detailed the progression of the disease, its various clinical manifestations, and the efficacy of different preventive measures, including vaccination. It emphasized that while most infections are self-limiting, a significant proportion can lead to severe acute hepatitis, especially in adults, highlighting the importance of prevention [12].

The broader context of HAV in developing countries was thoroughly discussed by Franco et al. in their 2012 publication on "Hepatitis A: Epidemiology and prevention in developing countries"[13]. This paper elucidated the unique challenges faced by these nations in controlling HAV, including limited resources, inadequate sanitation infrastructure, and difficulties in implementing widespread vaccination programs[13]. It stressed the need for integrated approaches that combine improved sanitation, hygiene education, and targeted vaccination to achieve effective control of the disease in such settings. The authors also highlighted the economic burden of HAV outbreaks on healthcare systems in developing countries, making prevention even more critical[13].

In this context, the acute outbreak of jaundice among final-year male students at the SZMC campus hostel in Bogra, Bangladesh, served as a critical trigger for an immediate and comprehensive public health investigation. The objectives of this investigation were multifaceted and strategically designed to address the unfolding crisis. First, a thorough assessment of the clinical and epidemiological characteristics of the outbreak was essential. This involved collecting detailed data on the symptoms experienced by affected students, their onset, demographics, and mapping the spread of the infection within the hostel to identify transmission patterns. Second, a key objective was to determine the likely source of the infection. This required tracing potential points of exposure, including food from various sources, water from shared facilities, and common contact points within the hostel, to pinpoint the outbreak's origin. Identifying the precise source was crucial for implementing effective, targeted control measures that could definitively break the transmission chain and prevent further cases. Finally, the investigation aimed to develop evidence-based preventive strategies to mitigate future outbreaks. These strategies included recommendations for improved sanitation practices within the hostel, enhancing hygiene education among residents, and considering the implementation of targeted vaccination programs to protect the student population from similar outbreaks. Understanding the dynamics of such outbreaks in transitional epidemiological settings like Bangladesh is not only vital for managing immediate crises but also for developing robust, long-term public health policies and interventions to safeguard community health. This proactive and comprehensive approach is essential for adapting to the evolving patterns of infectious diseases and protecting vulnerable populations in an ever-changing global health landscape.

Methods:

Study design and setting:

This investigation employed a descriptive cross-sectional study design. The study was conducted between March and June 2025 at Shaheed Ziaur Rahman Medical College (SZMC) in Bogura, Bangladesh. The primary focus of the study was on Bachelor of Medicine, Bachelor of Surgery (MBBS) students residing within the SZMC campus, specifically those who presented with clinical symptoms indicative of acute viral hepatitis. The study aimed to confirm these cases through laboratory testing for acute Hepatitis A virus (HAV) infection, utilizing a positive anti-HAV IgM test.

Case definition:

For the purposes of this outbreak investigation, a confirmed case of Hepatitis A was rigorously defined. A student was considered a confirmed case if they were a resident of the SZMC hostel, exhibited clinical features consistent with acute hepatitis, such as jaundice and malaise, and had a positive serum anti-HAV IgM test result obtained through enzyme-linked immunosorbent assay (ELISA). This strict case definition was

implemented to ensure consistency and accuracy in identifying true HAV infections specifically related to the outbreak.

Inclusion and exclusion criteria

To ensure the relevance and specificity of the study population to the outbreak, stringent inclusion and exclusion criteria were applied:

Inclusion criteria:

• Students presenting with clinical signs and symptoms suggestive of acute hepatitis, including, but not limited to, jaundice, dark urine, and fatigue.

• Laboratory confirmation of acute HAV infection, specifically through positivity for IgM anti-HAV antibodies.

• Documented residency in the SZMC hostel during the defined outbreak period.

Exclusion criteria:

• Students diagnosed with other etiologies of jaundice, such as Hepatitis B, Hepatitis E, alcoholic hepatitis, or drug-induced liver injury, to ensure that identified cases were exclusively attributable to HAV.

Data collection tools and procedures

A multifaceted approach was employed for data collection, utilizing a combination of structured questionnaires, medical record reviews, direct interviews, and environmental inspections. This comprehensive strategy aimed to provide a holistic understanding of the outbreak, integrating quantitative and qualitative data to identify the sources and patterns of transmission.

Epidemiological data collection:

A standardized, structured questionnaire was developed and administered to affected individuals to collect primary data. This tool was pivotal in systematically gathering information on:

• Demographics: Basic information such as age, gender, and residency details.

• Symptoms: Detailed information on the onset, progression, and severity of clinical manifestations.

• Water Consumption Habits: Information regarding sources of drinking water around the time the disease started.

• Food Consumption Habits: Data on dietary practices, including common food sources within the campus (e.g., college canteen, hostel dining facilities) and external food sources consumed around the time of diagnosis.

• Personal Hygiene Practices: Assessment of hygiene practices, including hand-washing and toilet usage.

• Living Conditions: Information on whether roommates or anyone on the same floor had been diagnosed with Hepatitis A.

Interviews with affected students were conducted to trace the onset and progression of symptoms, providing qualitative insights that complemented the quantitative data. These interviews also contributed to constructing a timeline of the outbreak, helping identify the index case and potential sources of contamination.

Clinical data collection:

Clinical history and examination findings for confirmed cases were systematically collected from existing medical records at SZMC Hospital and supplemented with direct interviews with affected students to gather additional details regarding their illness and hospital visits.

Environmental assessment:

A thorough inspection of the hostel's infrastructure was conducted to identify potential environmental risk factors. This included detailed examinations of water sources and the integrity of sanitation lines to identify possible contamination points. Environmental testing for potential microbial contamination in common areas and shared facilities was planned but had not been conducted at the time of the initial report. However, visual inspections provided critical preliminary insights into potential environmental risk factors.

Surveillance and contact racing

Surveillance systems were planned to monitor the emergence of new cases and identify commonalities between cases, although full implementation was noted as pending. Contact tracing was performed to identify individuals who might have been exposed to the virus. Preliminary findings suggested that almost everyone on campus may have been exposed to the virus, underscoring the urgency of widespread monitoring and preventive actions.

Laboratory testing

Serological testing for the confirmation of acute HAV infection was carried out at the Central Laboratory of SZMC Hospital. This testing specifically targeted the detection of anti-HAV IgM antibodies, indicative of a recent or ongoing infection. Commercial ELISA kits were utilized, boasting a high sensitivity of 98.9% and specificity of 99.4%, ensuring the reliable identification of HAV cases and facilitating accurate epidemiological

analysis. Additionally, various other laboratory tests were conducted, including:

- Anti-HAV IgG (to identify past exposure or immunity)
- SGPT, SGOT, bilirubin, ALP, and CBC, to assess liver function and the severity of the infection.

Data visualization and analysis

Data collected from the structured questionnaires were aggregated and analyzed to identify common patterns and potential correlations. The results of the questionnaires were visualized using various graphical representations to illustrate key findings, such as the proportion of affected students sharing living spaces, common food and water sources, and reported symptoms. For example, the distribution of responses regarding whether a roommate or anyone on their floor was diagnosed with Hepatitis A was presented as a pie chart, with 60.7% of respondents indicating "yes" and 39.3% indicating "no" from a total of 28 responses.

Results:

Epidemiological overview and timeline

The investigation revealed an escalating pattern of Hepatitis A cases within the SZMC campus hostel. The first confirmed case, a female student from Batch 27 residing in the Intern Ladies Hostel, experienced initial symptoms on July 28, 2023, and was diagnosed on August 2, 2023. Following this index case, the outbreak progressed, with three additional confirmed cases identified in September and another three in October. A significant surge in incidence was observed in November 2023, with a total of 22 confirmed cases diagnosed in these months alone. This rapid acceleration of cases in November underscored the urgency for immediate public health intervention. Contact tracing efforts indicated widespread potential exposure, suggesting that almost everyone on campus may have been exposed to the virus.

Demographics and clinical presentation

The outbreak affected students of both genders, with 62.1% of the affected population being male, and 37.9% female. While the initial cases included a higher proportion of female students, the specific cohort of 22 confirmed cases in November had a mean age of 23.1 years (SD ±1.1). Fortunately, the outbreak did not result in any hospitalizations or fatalities, with all affected students recovering with supportive care. The average duration of symptoms among these students was observed to range from 7 to 10 days.

A comprehensive review of reported symptoms from 29 affected individuals (including the initial cases) revealed a consistent clinical presentation:

- Jaundice, Fever, and Fatigue were the most prevalent symptoms, each reported by 26 out of 29 students (89.6%).
- Nausea and Vomiting affected 23 out of 29 students (79.3%).
- Pale stool was noted by 15 out of 29 students (51.7%).
- Abdominal pain was reported by 12 out of 29 students (41.3%).

Less common symptoms included urticaria (3.4%), allergy (3.4%), dark urination (3.4%), and severe headache (3.4%). The high frequency of classical Hepatitis A symptoms such as jaundice, fever, and fatigue suggests that students presenting with these manifestations should be promptly considered for Hepatitis A testing.

Table 1: Frequency of symptoms in affected students (n=29)

Symptom	Number of Patients (n)	Percentage (%)
Jaundice	26	89.6%
Nausea and vomiting	26	89.6%
Dark urine	1	3.4%
Fever	26	89.6%
Abdominal pain	12	41.3%
Severe Headache	1	3.4%
Weakness	1	3.4%

Laboratory findings

Laboratory testing played a crucial role in confirming Hepatitis A cases and assessing liver function. Among the 28 students who underwent testing:

- Anti-HAV IgM was detected in 22 students (75.86%), indicating acute or recent HAV infection.
- SGPT levels were elevated in 27 students (93.1%), reflecting hepatocellular injury commonly associated with acute hepatitis.
- Bilirubin levels were elevated in 27 students (93.1%), consistent with the observed symptom of jaundice.
- Anti-HAV IgG was detected in 8 students (27.58%), suggesting past infection or immunity.

Other tests performed included CBC (67.9%), SGOT (20.7%), and ALP (24.1%). These laboratory results confirmed acute Hepatitis A infection as the cause of the outbreak.

Table 2: Laboratory results for affected students

Lab Test	Number Positive/Elevated (n)	Percentage Positive/Elevated (%)
Anti - HAV IgM	22	75.86%
Anti - HAV IgG	8	27.58%
SGPT	27	93.1%
Bilirubin	27	93.1%
SGOT	6	20.7%
ALP	7	24.1%

Epidemiological features and risk factors

Investigation into the commonalities among affected students identified several key epidemiological features and potential risk factors for transmission:

- Water Sources:
  - Consumed water from electric filter in LH/BH: 17 students (58.62%).
  - Consumed direct tap water (before filter installation): 13 students (44.82%).
  - Consumed supplied water: 1 student (3.4%).
  - Consumed water from own filter: 1 student (3.4%).
  - Consumed water sometimes from the canteen: 1 student (3.4%).
- Food Sources:
  - Consumed food from inside campus sources (canteen, dining): 24 students (82.75%).
  - Consumed food from outside campus sources (e.g., Sudad): 15 students (51.72%).
- Contact and Environmental Exposures:
  - Roommate/anyone on floor diagnosed with Hepatitis A: 13 students (44.82%).
  - Direct contact with HAV-positive patient / used their toilet: 5 students (17.24%).
  - Used toilets in academic building: 20 students (68.96%).
  - Visited suspected place before disease onset: 2 students (6.89%).

Table 3: Risk factors for Hepatitis A transmission

Risk Factor/Exposure	Number of Patients (n)	Percentage (%)
Water Sources		
Consumed water from electric filter in LH/BH	17	58.62%
Consumed direct tap water (before filter installation)	13	44.82%
Consumed supplied water	1	3.4%
Consumed water from own filter	1	3.4%
Consumed water sometimes from canteen	1	3.4%
Food Sources		
Consumed food from Inside Campus sources (canteen, dining, etc.)	24	82.75%
Consumed food from Outside Campus sources (Sudad, etc.)	15	51.72%
Contact and Environmental Exposures		
Roommate/anyone on floor diagnosed with Hepatitis A	13	44.82%
Direct contact with HAV+ patient / used their toilet	5	17.24%
Used toilets in academic building	20	68.96%
Visited suspected place before disease	2	6.89%

Shared living spaces and hygiene practices

A significant proportion of affected students reported close contact with diagnosed cases within their living quarters. Specifically, 62.01% of the 29 respondents indicated that a roommate or someone on their floor had been diagnosed with Hepatitis A around the time of their own infection. This finding strongly suggests person-to-person transmission within shared living facilities, likely facilitated by the common use of washrooms and toilets.

Further observations revealed that shared washrooms and toilets in both the hostels and the academic building were frequently used by affected students. Critically, the toilets in the academic building lacked essential hygiene facilities such as hand washing stations and toilet tissue, creating a high-risk environment for faecal-oral transmission. The absence of these essential hygiene amenities compromised the effectiveness of hand hygiene, which is a cornerstone in preventing the spread of enteric viruses.

Food sources

The college canteen emerged as the most likely common source of infection. An overwhelming 75.86% (22 out of 29) of the affected students reported consuming food from the college canteen around the time their illness began. Further investigation into the canteen's conditions revealed significant hygiene deficiencies, with employees occasionally handling food without proper handwashing. The presence of flies in the canteen also indicated poor sanitation practices. Despite other food sources being consumed by students, such as food from Sudad (44.8%), self-cooked meals (37.9%), and other campus dining facilities, the college canteen showed the strongest association with the outbreak.

Table 4: Food source and risk of infection

Food source category	Number of patients (n)	Percentage (%)
Inside campus	(Sum counts for Canteen, BH dining, LH dining, Hospital cafeteria)	(82.75%)
Outside campus	(Sum counts for Sudad, 1 number gate, Kader,Restaurant)	(51.72 %)

Drinking water sources

The investigation explored the drinking water sources used by students. Among the 29 respondents:

- 58.6% reported consuming water from electric filters installed in the Ladies and Boys Hostels.
- 55.2% used direct tap water prior to the installation of the filters.
- The environmental survey revealed a significant concern: a cracked sewage pipe found within 2 meters of a tube well located near the hostel kitchen, with clear evidence of sewage leakage. This close proximity between sewage and drinking water sources presented a critical pathway for contamination.

Despite the installation of electric filters approximately one month prior to the surge in cases, the filters were ineffective in preventing the outbreak, suggesting that while they may mitigate other waterborne diseases, they did not prevent the spread of Hepatitis A.

Vaccination status

A critical finding was that none of the affected students had received the Hepatitis A vaccination, highlighting a significant gap in immunization coverage within the student population. This lack of vaccination coverage contributed to the increased susceptibility of students to Hepatitis A infection.

External contacts

No confirmed instances of contact with Hepatitis A cases outside the hostel were identified among the affected students, further suggesting an internal source of transmission within the campus environment.

Assessment of current preventive measures

As of the investigation, the primary noticeable preventive measure was the installation of electric filters for drinking water in the hostel. However, as evidenced by the continued increase in cases after the installation, these filters proved ineffective in curbing the Hepatitis A outbreak. No other significant preventive steps were reported to have been taken before the investigation.

Discussion:

This outbreak of Hepatitis A virus (HAV) among students at the SZMC campus hostel serves as a stark reminder of the persistent risks of HAV transmission in communal living environments, particularly when sanitation and water quality are compromised. The findings of this study align with existing literature, which consistently links HAV outbreaks to inadequate water infrastructure in similar institutional settings. For example, studies conducted in hostels and educational institutions in neighbouring countries, such as India and Nepal, have repeatedly highlighted the vulnerability of high-density living spaces to outbreaks of HAV when water safety protocols are not rigorously maintained[14,15]. A report from North India (2010) underscored the critical role of contaminated water sources in facilitating the rapid spread of HAV within confined populations[14]. Similarly, a 2015 outbreak in Kathmandu, Nepal, demonstrated how easily HAV can spread in university hostels and other shared living environments,

emphasizing the need for stringent water safety measures [15].

Our investigation further corroborates these regional findings, highlighting that the risk factors for HAV transmission in communal settings are broadly consistent across South Asia. In particular, the SZMC outbreak emphasizes the urgent need for stringent oversight of water quality and sanitation practices in high-density living arrangements, such as university hostels. These environments, characterized by shared water sources, food facilities, and limited access to hygiene amenities, create ideal conditions for the transmission of HAV once the virus is introduced.

The epidemiological characteristics observed in this outbreak, particularly the timing of cases, are consistent with the natural history of HAV infection. The incubation period for HAV typically ranges from 15 to 50 days, with an average of 28 days[5]. This timing aligns with the clustering of cases in our study, which followed exposure to a contaminated water source. The prolonged incubation period often results in delayed recognition of outbreaks, allowing the virus to spread widely before intervention measures are implemented. This reinforces the need for rapid epidemiological investigations to identify sources of infection and mitigate further transmission. Another study further emphasized that the delayed onset of symptoms in HAV outbreaks often complicates timely intervention, making early detection even more critical[16].

As observed in our study, the severity of HAV infections was generally mild, with no fatalities and only self-limiting symptoms in most cases, which aligns with the established pattern of HAV infections in healthy young adults[5]. However, it is important to note that HAV infections can lead to more severe outcomes, particularly in older individuals or those with pre-existing liver conditions. Our findings are consistent with the natural course of HAV infection in young, otherwise healthy individuals, where the disease typically resolves with supportive care.

A striking finding from our investigation was the complete absence of prior HAV vaccination among the affected students, despite their residence within a medical institution. This highlights a significant gap in public health awareness and vaccination coverage among young adults in Bangladesh, particularly in university settings. The Centers for Disease Control and Prevention (CDC), in its 2021 guidelines, emphasizes the importance of HAV vaccination in preventing outbreaks, especially in high-risk settings such as universities, where students often live in communal environments with shared amenities[17]. Similarly, the World Health Organization (WHO) consistently recommends HAV vaccination for individuals living in group housing, particularly in regions with a high risk of transmission[18].

The lack of vaccination among the affected students is particularly concerning, as these individuals are not only at risk of contracting HAV but may also be exposed to other infectious diseases given their future roles in the healthcare system. This finding underscores a broader systemic issue in Bangladesh, where adult immunization policies may be lagging, despite increasing health literacy within the population. A 2020 study from the Advisory Committee on Immunization Practices (ACIP) advocates for universal childhood vaccination, which would ultimately reduce the burden of HAV in adult populations. However, for countries in epidemiological transition like Bangladesh, where the age of HAV susceptibility is shifting, targeted adult vaccination remains crucial for immediate protection[19].

In response to the outbreak, immediate preventive measures were recommended and initiated. These included the chlorination of the entire water supply system within the hostel to neutralize any remaining viral contamination. Given the strong epidemiological link to the shared water source, another crucial measure was the relocation of the implicated tube well to a safer, uncontaminated site, minimizing the risk of future waterborne transmission. Public health education was also prioritized, with a focus on promoting hand hygiene among all hostel residents, particularly after using the toilet and before preparing or consuming food. This is a fundamental preventive measure for faecal-oral transmitted diseases like HAV, as highlighted in numerous public health guidelines [17,18].

Furthermore, vaccination of non-immune residents was

strongly recommended as a proactive strategy to establish herd immunity within the hostel population and prevent further spread of the virus. The implementation of these measures was informed by previous outbreaks and established public health best practices. For example, the 2010 study by Jacobsen and Wiersma on HAV seroprevalence indirectly supports the need for targeted vaccination in populations with high susceptibility[3].

Looking ahead, this outbreak underscores the critical importance of proactive surveillance and robust public health infrastructure in countries experiencing epidemiological transitions. As Bangladesh continues to improve its sanitation infrastructure, the age of primary HAV infection will likely shift, making older populations more susceptible to symptomatic disease and outbreaks. Ongoing monitoring of HAV seroprevalence, especially in urban and semi-urban settings, is essential for developing targeted vaccination strategies. Furthermore, enforcing water quality standards and conducting regular sanitation audits in communal living facilities such as university hostels are vital measures to prevent future outbreaks. The experience from this outbreak also advocates for a comprehensive review and potential revision of national immunization policies in Bangladesh to include HAV vaccination for at-risk adult populations, in line with WHO and CDC recommendations. Such policy changes would not only protect vulnerable groups but also contribute to reducing the overall burden of HAV, ultimately advancing towards better public health outcomes in the country.

Strengths and limitations

This study provides timely documentation of an acute HAV outbreak in a real-world academic setting, emphasizing the need for preventive infrastructure and policy-level changes.

Strengths:

• The study used laboratory-confirmed diagnoses (IgM anti-HAV) to ensure diagnostic accuracy and minimize uncertainty.

• Environmental inspections and triangulation with patient interviews helped identify a likely source of the outbreak, strengthening the epidemiological validity of the findings.

• As a firsthand account from medical students, the study allowed for better compliance, detailed symptom reporting, and accurate recall of events.

Limitations:

• The study was conducted in a single institution, which may limit the generalizability of the findings to other academic or non-academic populations.

• Environmental water testing for HAV RNA or bacterial contamination was not conducted due to the lack of access to virological facilities, which prevented direct microbial confirmation of the contaminated source.

• The sample size (n=29) was relatively small, and although it was sufficient for outbreak reporting, it may limit the statistical power of broader analyses.

• Recall bias may have influenced reporting, especially regarding hygiene practices and exposure history, particularly concerning water consumption habits.

Conclusion:

The Hepatitis A outbreak at the SZMC hostel was traced to a fecally contaminated tube well, compromised by a nearby damaged sewage line. The swift and coordinated implementation of public health measures successfully curtailed the outbreak's spread, preventing further cases. Based on the findings, we recommend the following public health actions:

1.Routine inspection and maintenance of water and sewage infrastructure in hostels and other communal living settings to prevent future outbreaks.

2.Implementation of health education programs focused on hygiene, food safety, and water sanitation.

3.Consideration of targeted HAV vaccination for high-risk groups, including students in residential institutions, to strengthen immunity and reduce future transmission. These actions, if adopted, will not only prevent future outbreaks of Hepatitis A in similar settings but also improve overall public health management in communal environments.

Author’s statements:

This study was conducted at Shaheed Ziaur Rahman Medical College (SZMC) and received ethical approval from the Ethical Clearance Committee of the institution. The research adhered to all institutional and local ethical guidelines and regulations. Informed consent was obtained online from all participants before they proceeded with the survey. Participants were assured that their responses would remain confidential, and they had the right to withdraw from the study at any stage without

providing any justification. Additionally, consent was obtained for the use of anonymized data in this publication, in line with ethical research practices.

Acknowledgements:

The authors would like to acknowledge the sincere cooperation of the SZMC laboratory staff, hostel administration, and the students who participated in this study. Special thanks are extended to the Department of Community Medicine for providing technical and logistical support during the outbreak investigation.

Funding:

The authors declare that no financial support was received for the research, authorship, or publication of this article.

Conflict of interest:

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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