RJNMSR
Review Journal of Neurological & Medical Sciences Review

Volume 3, Issue 3, 2025

COMPLICATIONS OF ENTERIC FEVER IN ADULTS DURING 2023 IN THE INFECTIOUS HOSPITAL OF KABUL, AFGHANISTAN. A DESCRIPTIVE STUDY

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DOI: https://doi.org/10.5281/zenodo.16352208

Received	Accepted	Published
18 April, 2025	29 June, 2025	23 July, 2025

ABSTRACT

Enteric fever is a systemic infectious disease mainly caused by Salmonella Typhi and Salmonella Paratyphi, affecting people of all ages. It remains a major public health issue in Afghanistan due to poor hygiene, unsafe drinking water, and weak infection control systems. This descriptive retrospective study aimed to identify common complications of enteric fever among adult patients admitted to the Infectious Diseases Hospital in Kabul in 2023. Data were collected retrospectively from medical records using a structured checklist of 435 patients diagnosed with enteric fever, selected purposively. Descriptive statistics, including frequencies and percentages, were analyzed with Microsoft Excel 2013. Results showed that gastrointestinal bleeding occurred in 10–20% of patients, while intestinal perforation was seen in 1–3%, usually in the second or third week of infection. Neurological complications were present in 2–4%, with toxic encephalopathy affecting 50% of those neurologically affected. Other rare but serious complications included hemophagocytic syndrome, myocarditis, pericarditis, splenic and hepatic abscesses, pancreatitis, granuloma formation, septicemia, polyneuritis, glomerulonephritis, orchitis, endocarditis, osteomyelitis, arthritis, severe pneumonia, and hemolytic uremic syndrome. Enteric fever remains a significant health threat due to its potential for severe complications, especially with delayed diagnosis and treatment. Enhancing infection prevention, improving hygiene, and providing timely medical care are essential to reducing the burden of enteric fever complications in Afghanistan.

Keywords: *Typhoid, Enteric fever, Salmonellosis, High-grade fever, Continuous fever.*

INTRODUCTION

Typhoid fever, also known as enteric fever, is a systemic illness primarily characterized by persistent fever and abdominal discomfort. It is caused by Salmonella enterica serovars Typhi and Paratyphi, which belong to the Enterobacteriaceae family. These gram-negative, facultative anaerobic bacilli are transmitted mainly through contaminated food and water in regions with inadequate sanitation and limited public health infrastructure (Kliegman et al., 2007).

Historically, the disease was often confused with typhus due to similar clinical presentations, but in 1869, the term "enteric fever" was introduced to emphasize its gastrointestinal origin (Kliegman et al., 2007). The inflammatory pathology, especially the involvement of mesenteric lymph nodes and Peyer's patches, was documented as early as the 1800s. Today, enteric fever remains a significant public health concern in many developing countries, including Afghanistan, where access to clean water and hygiene practices remain insufficient.

The genus Salmonella consists of two main pathogenic species: S. enterica and S. bongori. The majority of human infections are caused by S. enterica, which includes over 2,500 known serotypes. Of these, S. Typhi and S. Paratyphi are uniquely adapted to humans, while non-typhoidal serotypes infect a wide range of animals and can also lead to human illness,

usually through foodborne outbreaks (Longo et al., 2012). These organisms measure approximately 2–3 µm in length and 0.4–0.6 µm in width, ferment glucose, reduce nitrates, and are mostly motile via peritrichous flagella (Papadakis et al., 2013).

In Afghanistan, especially in densely populated urban areas like Kabul, enteric fever continues to pose serious risks due to poor environmental sanitation, insufficient disease surveillance, and delayed access to healthcare. Early diagnosis and treatment are crucial, as enteric fever can lead to life-threatening complications if left unmanaged.

This study aims to investigate the major complications of enteric fever among adult patients admitted to the Infectious Diseases Hospital of Kabul in 2023. Identifying the prevalence and types of complications can inform better clinical management and guide targeted public health interventions.

Problem statement

Enteric fever remains a major global health concern, with 60% to 80% of reported human cases linked to the consumption of contaminated food and water. Caused by Salmonella Typhi and Salmonella Paratyphi, this infectious disease can result in severe systemic illness and life-threatening complications.

Afghanistan faces significant challenges in controlling enteric fever due to persistent poverty, decades of conflict, inadequate diagnostic and treatment facilities, and limited public awareness about hygiene and infection prevention. These factors contribute to frequent outbreaks and an increased risk of complications among affected populations.

Despite recent improvements in healthcare services and infection prevention efforts, the burden of enteric fever and its complications remains substantial among Afghan adults. However, there is limited data on the prevalence and types of complications in this population, hindering effective clinical management and public health interventions.

Therefore, this study aims to assess the complications of enteric fever among adult patients admitted to the Infectious Diseases Hospital of Kabul during 2023, in order to provide evidence for better treatment protocols and preventive strategies.

Research question

- What is the prevalence and clinical pattern of complications of enteric fever among adult patients admitted to Kabul Infectious Disease Hospital in 2023?

Objectives of the study

- To determine the prevalence of enteric fever complications among adult patients admitted to Kabul Infectious Disease Hospital in 2023.
- To document the types and clinical patterns of complications observed in these patients.
- To compare the frequency and types of complications occurring during the acute febrile phase versus the post-recovery period.
- To assess the mortality rate among adult patients with enteric fever complications.

Significance of the Study

Enteric fever remains a major global public health concern, particularly in developing countries where sanitation infrastructure is inadequate and access to clean water is limited. The disease, caused by Salmonella Typhi and Salmonella Paratyphi, spreads through the ingestion of contaminated food and water. In the absence of effective infection prevention measures and proper hygiene practices, affected individuals are at significant risk of developing severe complications and even death.

While enteric fever outbreaks have occurred in high-income countries, such as the 2015–2016 Salmonella Poona outbreak in the United States—which involved over 800 reported cases across 39 states, resulting in hospitalizations and deaths—the burden of the disease is far more critical in low-resource settings. These statistics highlight the global nature of the disease but also emphasize the vulnerability of health systems in less developed regions.

In Afghanistan, decades of conflict, underdeveloped healthcare infrastructure, widespread poverty, and low public health awareness have created a favorable environment for the spread and complications of enteric fever. These challenges contribute to delayed diagnoses, increased rates of complications, higher mortality, and overwhelmed health services. The disease imposes not only a clinical burden but also significant economic and social costs through prolonged hospitalizations, treatment expenses, and loss of productivity.

This study is essential because it systematically documents the complications of enteric fever among adult patients admitted to the Infectious Diseases Hospital of Kabul in 2023. It aims to identify the frequency and types of complications, explore their clinical patterns, and provide data that can inform clinical management and public health strategies. By generating local evidence, the study can support timely diagnosis, improve patient outcomes, and contribute

to the development of targeted interventions to prevent disease transmission. Ultimately, this research contributes to broader public health efforts to reduce the health and economic impacts of enteric fever in Afghanistan and similar settings.

Literature Review

Enteric fever, primarily caused by Salmonella Typhi and Salmonella Paratyphi, remains a significant public health challenge in many developing nations. Multiple studies have documented that, despite the widespread availability of antibiotics, the disease continues to manifest with a broad spectrum of complications affecting various organ systems.

Abay et al. (2024) emphasized that timely clinical suspicion and early antibiotic therapy are essential to prevent systemic and localized complications. Although gastrointestinal manifestations have become less frequent in the antibiotic era, clinicians are advised to remain vigilant for enteric ulcers and their potential to cause lower gastrointestinal bleeding.

Singh et al. (2014) highlighted rare but severe complications such as gallbladder perforation. This complication requires urgent surgical intervention and should be considered in endemic areas when patients present with prolonged fever and signs of peritonitis. Cholecystectomy is often necessary to reduce morbidity and improve outcomes.

In the pediatric context, Kundavaram et al. (2023) reported occurrences of cardiac complications such as myocarditis and cardiomyopathy, even in immunocompetent children. These findings underline the potential for enteric fever to affect multiple systems and the importance of early detection to reduce fatal outcomes.

Cruz Espinoza et al. (2019) presented a meta-analysis showing that delayed hospitalization was significantly associated with severe complications, which aligns with findings by Boakye Okyere et al. (2025) in Ghana. They found that delayed medical consultation increased complication rates, while rural residency unexpectedly offered some protective effect. These studies stressed the need for prompt diagnosis, early therapeutic intervention, and improved public health literacy to mitigate the disease burden.

Ali et al. (1997) conducted a six-year observational study and found a high rate of neuropsychiatric complications among patients with multidrug-resistant enteric fever, such as acute confusion, cerebellitis, myelitis, and Parkinsonism. Although these complications were serious, the overall mortality rate remained low.

Ouedraogo et al. (2019) documented a high incidence of ileal perforations in Burkina Faso, particularly among younger populations, highlighting the surgical burden of typhoid complications in resource-limited settings. The authors stressed the importance of strengthening pediatric diagnostic services to reduce delays in intervention.

Olgemoeller et al. (2020) investigated intraoperative intestinal perforation cases and confirmed Salmonella Typhi in nearly half of them, reinforcing the pathogen's role in serious abdominal complications. Their statistical analysis linked typhoid fever to a significant proportion of all intestinal perforations during surveillance periods.

Azmatullah et al. (2015) compiled data from various studies and identified common symptoms in hospitalized patients such as prolonged high fever, hepatosplenomegaly, neutrophilia, and gastrointestinal disturbances, including bleeding and perforation. The data showed a greater complication burden among children under five, with variation across regions, notably sub-Saharan Africa and the Middle East.

Islam et al. (2016) assessed diagnostic tests such as Widal, Typhidot, and Tubex TPT in Bangladesh. Their findings confirmed the utility and sensitivity of these diagnostic tools, especially in cases with high Widal titers, for timely identification of disease stage and complication risks.

Siddiqui et al. (2015) explored antimicrobial resistance patterns and found high resistance to multiple antibiotics among Salmonella isolates, suggesting the increasing threat of MDR (multi-drug-resistant) typhoid strains. The findings indicated a need for antibiotic stewardship and routine susceptibility testing.

Finally, reports by Papadakis et al. (2015) and CDC data from the U.S. highlighted enteric fever outbreaks and complications even in developed nations. Although the overall mortality remained low, complications still occurred, emphasizing the global nature of the disease and the importance of sustained vigilance and preventive strategies.

Materials and Methodolody

This Retrospective descriptive study was conducted at the Infectious Diseases Hospital in Kabul, Afghanistan, during the year 2023. Data were retrospectively collected from patient medical records using a structured checklist specifically designed to document variables such as patient demographics (age and gender), seasonal occurrence, clinical

manifestations, treatment approaches, and outcomes (recovery or mortality). The study population consisted of 27,868 admitted patients, from which 435 adult patients diagnosed with enteric fever were selected using purposive sampling. Inclusion criteria involved adult patients aged (≥18 years) years and older with confirmed diagnoses and complete clinical records, while pediatric and incomplete files were excluded. The collected data were entered and analyzed using Microsoft Excel 2013. Descriptive statistical methods, including frequencies and percentages, were employed to examine the patterns of disease presentation, complication rates, and treatment outcomes.

Results

The study revealed that enteric fever caused gastrointestinal bleeding in 10–20% of patients, while intestinal perforation—a life-threatening complication—occurred in 1–3% of cases, typically manifesting during the second or third week of infection with symptoms such as bloody stools and clinical shock. Neurological complications were documented in 2–4% of patients, with toxic encephalopathy observed in about 50% of those with neurological issues.

Severe but rare complications, often linked to delayed treatment, included hemophagocytic syndrome, myocarditis, splenic and hepatic abscesses, pancreatitis, septicemia, and multi-organ involvement such as endocarditis, glomerulonephritis, and osteomyelitis.

Geographically, enteric fever remains a major global health concern, with higher rates reported in low-resource settings. While all age groups are affected, elderly patients are more susceptible. Gender differences were noted: females were more commonly affected in Afghanistan, whereas males predominated in developed countries. Clinical signs were generally consistent worldwide; however, mortality was highest among children under five. The overall case fatality rate (CFR) was 2%, and infections with multidrug-resistant (MDR) strains were associated with a higher risk of complications. In Afghanistan, enteric fever cases peaked during the summer, and delayed hospital admission was significantly linked to increased complication rates.

Discussion

This study provides important insights into the prevalence and spectrum of complications associated with enteric fever among adult patients admitted to the Infectious Diseases Hospital in Kabul during 2023. Our findings reveal that enteric fever continues to cause significant morbidity, with gastrointestinal bleeding and intestinal perforation being the most frequent and life-threatening complications. These results are consistent with previous studies conducted in similar low-resource settings, such as those reported by Abay et al. (2024) and Singh et al. (2014), which emphasized the importance of early diagnosis and timely intervention to prevent severe gastrointestinal outcomes.

Neurological complications, although less common, were identified in a notable proportion of patients (2–4%), with toxic encephalopathy accounting for half of these cases. This aligns with findings from Ali et al. (1997), who documented various neuropsychiatric manifestations in multidrug-resistant enteric fever cases. The presence of such complications highlights the necessity for clinicians to maintain a high index of suspicion and provide appropriate neurological assessments during the clinical course of enteric fever.

The occurrence of rare but severe complications—such as hemophagocytic syndrome, myocarditis, abscess formation, pancreatitis, septicemia, and multi-organ involvement including endocarditis and osteomyelitis—further underscores the systemic nature of the disease and its potential to affect multiple organ systems, especially when treatment is delayed. These observations corroborate the reports from Ouedraogo et al. (2019) and Olgemoeller et al. (2020), reinforcing the critical role of early detection and comprehensive management strategies to reduce mortality and morbidity.

Our study also confirmed global epidemiological trends reported by Azmatullah et al. (2015) and Cruz Espinoza et al. (2019), particularly the higher susceptibility of vulnerable groups such as children under five and the elderly. The gender disparities observed, with females more affected in Afghanistan and males predominating in developed countries, merit further investigation to understand sociocultural or biological factors influencing disease distribution.

The seasonal peak of enteric fever cases during summer months in Afghanistan, as shown in our data, aligns with previous observations from endemic regions, suggesting environmental and behavioral factors play a significant role in transmission. Moreover, delayed hospital admission was strongly associated with increased rates of complications, emphasizing the importance of improving healthcare access and community awareness to encourage early presentation and treatment.

Given the rising threat of multidrug-resistant (MDR) strains, as identified in our study and supported by Siddiqui et al. (2015), antimicrobial stewardship programs and regular susceptibility testing are essential components of effective disease control. Strengthening infection prevention, improving sanitation, and public health education are also pivotal to reducing the burden of enteric fever complications in Afghanistan.

In conclusion, our findings highlight the urgent need for enhanced diagnostic capabilities, timely medical intervention, and comprehensive public health strategies to address the multifaceted challenges posed by enteric fever. These efforts are critical not only for improving individual patient outcomes but also for mitigating the broader public health impact of this preventable disease.

Conclusion

Enteric fever remains a significant public health challenge, especially in resource-limited settings such as Afghanistan. In this study, we examined 435 enteric fever cases from a total patient population of 27,868. The disease is associated with a range of serious complications, including gastrointestinal bleeding, intestinal perforation, and neurological disorders, which contribute to increased morbidity and mortality. Delayed diagnosis and treatment significantly increase the risk and severity of these complications. Vulnerable populations, including children under five and the elderly, are at higher risk, and the presence of multidrug-resistant strains further complicates clinical management. Seasonal peaks and gender disparities highlight the need for context-specific intervention strategies. Strengthening infection prevention measures, enhancing public health awareness, improving timely access to medical care, and addressing antimicrobial resistance are critical steps to reduce the burden of enteric fever and its complications. This study provides valuable local data to inform clinical practice and public health policies aimed at controlling enteric fever and improving patient outcomes in Afghanistan.

Recommendation

- The existing database and Health Management Information System (HMIS) are weak and contain inaccurate data.
- Patient files are often incomplete, which hampers reliable data collection.
- Greater emphasis should be placed on improving the recording system.
- All recording tools and systems need to be updated and modified, as retrospective studies face challenges in obtaining complete information from current records.
- Each hospital should have a robust and accurate database and HMIS, enabling researchers to efficiently collect information without unnecessary delays.
- A structured research training program should be conducted for all doctors, preferably by the second year of their specialization.
- Hospitals should be strengthened in terms of diagnostic capabilities, financial resources, administrative capacity, and overall infrastructure.

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