

## Coexisting hepatitis A and *Salmonella* Typhi infections presenting as fever of unknown origin in a 22-year-old male

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### ABSTRACT

Coinfections involving *Salmonella* Typhi and hepatitis A are exceedingly rare but can complicate diagnosis and management, particularly in endemic regions where both pathogens share feco-oral transmission routes. We report the case of a 22-year-old male who presented with a 9-day history of fever, abdominal pain, and vomiting. Initial evaluation confirmed hepatitis A infection; however, persistent fever and headache despite supportive management prompted repeat investigations. Blood cultures subsequently isolated *Salmonella* Typhi, establishing a dual infection. The patient responded to intravenous meropenem and was discharged on oral cefixime. This case is unique because the coexistence of hepatitis A and typhoid fever mimicked a fever of unknown origin, delaying appropriate treatment. It highlights the need to consider multiple concurrent infections in patients presenting with persistent fever and abdominal symptoms in endemic areas. Comprehensive evaluation, including repeat cultures and liver function tests, is essential for accurate diagnosis and timely management.

**Key words:** Coinfection, Fever of unknown origin, Hepatitis A, *Salmonella* Typhi

**F**ever of unknown origin (FUO) is a frequent diagnostic challenge in clinical practice, particularly in regions where multiple infectious diseases are endemic. In developing countries, viral hepatitis and typhoid fever remain common causes of FUO [1,2]. Although these infections typically occur independently, co-infections are rare and can contribute to prolonged illness if not promptly recognized [2,3]. Hepatitis A and *Salmonella* Typhi share feco-oral transmission routes, primarily through contaminated food and water, which increases the likelihood of dual infections in areas with poor sanitation [1,4]. Co-infections may complicate clinical diagnosis because overlapping symptoms – such as fever, abdominal pain, nausea, and jaundice – can obscure the presence of one pathogen when the other is already identified [3-5]. Reports of simultaneous hepatitis A and typhoid fever are scarce, highlighting the diagnostic and therapeutic challenges they pose [3-6]. Early recognition of co-infections is crucial to ensure timely initiation of appropriate therapy, including consideration of multidrug-resistant pathogens, which can further complicate management [1,6].

Here, we report a rare case of a 22-year-old male presenting with coexisting hepatitis A and *Salmonella*

Typhi infection, mimicking FUO, and emphasize the importance of maintaining clinical vigilance and comprehensive evaluation in endemic regions. This case highlights the importance of considering co-infections in endemic regions, particularly when fever persists despite treatment for a single pathogen. The overlapping clinical features of hepatitis A and typhoid fever can obscure diagnosis, emphasizing the need for repeated investigations and tailored therapy to ensure effective management.

### CASE PRESENTATION

A 22-year-old male presented with a 9-day history of intermittent fever, progressively increasing in intensity. Initially, the fever was low-grade and associated with generalized weakness and headache. Over the following days, the fever became high-grade and persistent, accompanied by chills and night sweats. He developed nausea and multiple episodes of vomiting, worsened by diffuse abdominal discomfort, more pronounced in the right upper quadrant, suggesting possible hepatic involvement. The patient also reported anorexia, contributing to mild dehydration. He had a history of consuming street food, a known risk factor for enteric infections and viral hepatitis, both transmitted via the feco-oral route in regions with poor sanitation.

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On examination, the patient was alert but appeared ill. Vital signs revealed a temperature of 102.4°F, heart rate of 110 bpm, and blood pressure of 110/70 mmHg. He was icteric, with yellowing of the sclera and mild jaundice of the skin. Dehydration was evident through dry mucous membranes and decreased skin turgor. Abdominal examination showed mild tenderness in the right upper quadrant without guarding or rebound tenderness. Cardiovascular, respiratory, and neurological examinations were unremarkable.

Laboratory investigations revealed markedly elevated liver enzymes and hyperbilirubinemia, consistent with hepatic involvement (Table 1). Initial blood cultures were sterile, but serology confirmed hepatitis A infection. Despite supportive care, including intravenous fluids and monitoring, the patient continued to experience persistent high-grade fever, headache, and malaise.

Given the ongoing fever, repeat blood cultures were performed, which subsequently isolated *Salmonella* Typhi, confirming a co-infection. Antibiotic therapy was escalated to intravenous meropenem, resulting in rapid clinical improvement. The patient was later discharged on oral cefixime with complete resolution of symptoms.

## DISCUSSION

FUO in young adults often presents a diagnostic challenge, particularly in regions where multiple infectious diseases are endemic. Typhoid fever and hepatitis A are both common causes of FUO in developing countries, transmitted primarily via the feco-oral route through contaminated food and water [1,2]. Although each infection is common individually, co-infections with both pathogens are rare and can obscure the clinical picture, delaying appropriate management [2,3].

A similar case was reported by Lakxmi *et al.*, in a 35-year-old male who had a high-grade fever with mild transaminitis. Blood culture grew *Salmonella* Typhi, and despite being treated with culture-sensitive antibiotics at adequate dosage, he developed jaundice and had worsening transaminitis (>1,000 IU/L), which was treated appropriately with antibiotics [7]. Another case was reported in a 10-year-old girl who came with complaints of a 10-day history of low-grade intermittent fever, yellow discoloration of the sclera and urine, and right upper abdominal pain. The final diagnosis was

confirmed as co-infection of hepatitis A and *Salmonella* Typhi infection [8]. Co-existence of typhoid fever and hepatitis was reported in a 7-year-old boy, who was managed successfully [9].

In this case, the patient's initial presentation with fever, abdominal discomfort, nausea, and jaundice was consistent with hepatitis A. However, persistent high-grade fever despite supportive care prompted further investigations, ultimately revealing a co-infection with *Salmonella* Typhi [1,4]. The overlapping clinical features of hepatitis A and typhoid fever – such as fever, malaise, gastrointestinal symptoms, and liver enzyme elevation, complicating the early recognition of dual infections [3-5].

This case highlights several important clinical considerations. First, in endemic regions, clinicians should maintain a high index of suspicion for co-infections when fever persists despite initial therapy [3,6]. Second, repeat blood cultures and comprehensive laboratory evaluation are crucial for identifying secondary infections, particularly in patients with risk factors such as consumption of street food or exposure to unsanitary conditions [1,2]. Third, the presence of multidrug-resistant *Salmonella* Typhi may necessitate escalation to broad-spectrum antibiotics, such as meropenem, as seen in this patient [1,4,6].

The uniqueness of this case lies in the simultaneous occurrence of hepatitis A and *Salmonella* Typhi, mimicking FUO, which is rarely reported in the literature. Awareness of such co-infections is essential to avoid diagnostic delays, prevent complications, and guide appropriate antimicrobial therapy [3-6]. Early recognition and timely management can improve outcomes, particularly in endemic areas where multiple food and waterborne pathogens coexist. The uniqueness of this report lies in the simultaneous occurrence of hepatitis A and typhoid fever, highlighting the need for clinical vigilance in endemic areas where food- and waterborne pathogens frequently co-exist. Awareness of such co-infections can aid in prompt diagnosis, reduce morbidity, and inform public health strategies to prevent similar cases.

## CONCLUSION

This case demonstrates the diagnostic challenges posed by co-infections with hepatitis A and *Salmonella* Typhi, which can present as FUO. In endemic regions, clinicians should maintain a high index of suspicion for multiple concurrent infections, especially when patients continue to exhibit fever despite standard therapy. Repeated laboratory investigations, including blood cultures and liver function tests, are essential for identifying co-infections and guiding appropriate treatment. Early recognition and timely initiation of appropriate antibiotics, as in this case with meropenem followed by oral cefixime, can prevent complications and improve patient outcomes.

**Table 1: Laboratory investigations of the patient**

Test	Result	Reference range
Total serum bilirubin	3.59 mg/dL	0.3–1.2 mg/dL
Direct serum bilirubin	3.42 mg/dL	0.1–0.4 mg/dL
Serum glutamic-oxaloacetic transaminase (AST)	4813 IU/L	10–40 IU/L
Serum glutamic pyruvic transaminase (ALT)	3907 IU/L	10–40 IU/L
Alkaline phosphatase	95 IU/L	44–147 IU/L
Amylase	56 IU/L	30–110 IU/L
Lipase	52 IU/L	10–140 IU/L

AST: Aspartate aminotransferase, ALT: Alanine transaminase

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