



MULTIDRUG-RESISTANT ENTERIC FEVER IN A PEDIATRIC PATIENT: A DIAGNOSTIC AND THERAPEUTIC CHALLENGE

Paediatric Medicine

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ABSTRACT

Enteric fever, caused primarily by *Salmonella typhi* and *Salmonella paratyphi*, is a significant public health concern, particularly in regions with poor sanitation and hygiene. We present a case of multi-drug resistant (MDR) enteric fever in a 5-year-old male child with notable hepatosplenomegaly, minimal pleural effusion, and moderate ascites. The case underscores the challenges in managing MDR infections in pediatric patients and the importance of prompt diagnosis and appropriate antimicrobial therapy.

KEYWORDS

Enteric fever, Multi-drug resistant, Hepatosplenomegaly, Pleural effusion, Ascites, Pediatric

INTRODUCTION

Enteric fever remains a considerable burden on global health, especially in developing countries where access to clean water and sanitation facilities is limited. *Salmonella typhi* and *Salmonella paratyphi* are the primary etiological agents responsible for enteric fever.¹ Multi-drug resistance (MDR), defined as resistance to at least three classes of antibiotics, has emerged as a significant challenge in the management of enteric fever. The emergence of multidrug-resistant (MDR) strains of *Salmonella* presents a formidable challenge in the management of this infectious disease, complicating treatment strategies and contributing to increased morbidity and mortality rates, especially among children.²

In this context, understanding the clinical manifestations, diagnostic challenges, and management strategies for MDR enteric fever is paramount. Pediatric patients, in particular, are at risk of developing severe complications such as hepatosplenomegaly, pleural effusion, and ascites. This case report presents a 5-year-old male child diagnosed with MDR enteric fever, highlighting the complexities of managing antimicrobial resistance and the importance of prompt diagnosis and appropriate treatment interventions in pediatric populations.

CASE STUDY

A 5 year old male child came to paediatric outpatient department with history of fever and abdominal pain for the past 1 week. Fever was high grade undocumented on and off in nature gradually progressive and relieved on oral medication. Abdominal pain was acute onset; mild in intensity; localised to epigastric region; non radiating with no relieving or aggravating factor. Parents noticed the child's abdominal girth is increasing since the past 3-4 days. There was no history of blood transfusion and any drug intake. On examination the child had pallor with everted protruding umbilicus. Liver was palpable 4cm below right sterno-coastal margin soft consistency round border smooth surface with a span of 13 cm. Spleen was palpable 4 cm below left sternocoastal margin. On percussion revealed dullness in the flanks suggestive of ascites. Additionally, auscultation of the chest detected minimal pleural effusion. Other systemic examination was unremarkable.

Investigations:

Laboratory investigations revealed leukocytosis with neutrophils predominance, elevated acute-phase reactants (ESR and CRP), and thrombocytopenia. Widal test was done which was suggestive of *S. typhi* infection with titre of 1:320 positive. Blood cultures were obtained on admission, and empiric therapy with intravenous ceftriaxone was initiated. However, subsequent culture reports confirmed the presence of *Salmonella typhi* with resistance to ceftriaxone, ciprofloxacin, and amikacin, indicating multi-drug resistance. Ultrasound examination of the abdomen showed hepatosplenomegaly, moderate ascites, umbilical hernia and minimal pleural effusion. A chest X-ray corroborated the findings of pleural effusion.

Management and Outcome:

In light of history of high grade fever spikes iv antibiotic (in Ceftriaxone) was started. Symptomatic management was given. As fever spikes continued with similar intensity after 48 hours of starting antibiotic , azithromycin was added. Blood culture was obtained after 4 days of antibiotic course. MDR *Salmonella typhi* was observed in the blood culture, antimicrobial therapy was revised to intravenous meropenem based on susceptibility testing results. Supportive care, including hydration, nutritional support, and close monitoring of vital signs, was provided. The child showed gradual clinical improvement with resolution of fever and reduction in ascites and pleural effusion over the following week.

DISCUSSION

The case presented exemplifies the complex challenges associated with managing multidrug-resistant (MDR) enteric fever, particularly in pediatric populations. Enteric fever, caused predominantly by *Salmonella enterica* serovars Typhi and Paratyphi, remains a significant public health concern.

A study by Crump et al. underscores the global burden of typhoid and paratyphoid fever, emphasizing the need for effective management strategies to mitigate the impact of these diseases.¹ Furthermore, research by Kariuki et al. highlights the challenges posed by antimicrobial resistance in invasive *Salmonella* disease and emphasizes the importance of appropriate antimicrobial therapy.²

In this case, the 5-year-old male child presented with fever and abdominal pain, indicative of a systemic infection. Clinical examination revealed hepatosplenomegaly, ascites, and minimal pleural effusion, suggesting severe disease progression. Laboratory investigations, including Widal test and blood cultures, confirmed *Salmonella Typhi* infection with MDR characteristics.

Diagnostic challenges in MDR enteric fever are significant, as illustrated by the initial empiric therapy with ceftriaxone, which was later revised based on culture results. This highlights the importance of antimicrobial susceptibility testing in guiding treatment decisions, as emphasized in a study by Bhutta et al. discussing the diagnosis and treatment of typhoid fever.³

The management of MDR enteric fever in children necessitates a multidisciplinary approach, including appropriate antimicrobial therapy, supportive care, and close monitoring for complications. In this case, the child's clinical condition improved following the initiation of intravenous meropenem, emphasizing the importance of choosing effective antimicrobial agents based on susceptibility testing results.

Furthermore, supportive measures such as hydration and nutritional support are crucial in facilitating recovery, as demonstrated in the gradual clinical improvement observed in the child over the course of treatment. This aligns with the findings of Arjyal et al. , who conducted

a randomized controlled trial comparing gatifloxacin and ceftriaxone for uncomplicated enteric fever in Nepal, emphasizing the role of adjunctive therapies in enhancing patient outcomes.⁴

In conclusion, the presented case underscores the complexities of managing MDR enteric fever in pediatric patients and highlights the importance of prompt diagnosis, appropriate antimicrobial therapy, and supportive care interventions in optimizing clinical outcomes. Addressing antimicrobial resistance through judicious antibiotic use and comprehensive infection control measures is essential in mitigating the impact of enteric fever on global health. Further research and collaborative efforts are warranted to develop alternative treatment modalities and combat antimicrobial resistance effectively.

CONCLUSIONS

In conclusion, the presented case underscores the complexities of managing MDR enteric fever in pediatric patients and highlights the importance of prompt diagnosis, appropriate antimicrobial therapy, and supportive care interventions in optimizing clinical outcomes. Addressing antimicrobial resistance through judicious antibiotic use and comprehensive infection control measures is essential in mitigating the impact of enteric fever on global health. Further research and collaborative efforts are warranted to develop alternative treatment modalities and combat antimicrobial resistance effectively.

REFERENCES:

1. Crump JA, Mintz ED. Global trends in typhoid and paratyphoid Fever. Clin Infect Dis. 2010;50(2):241-246.
2. Kariuki S, Gordon MA, Feasey N, Parry CM. Antimicrobial resistance and management of invasive Salmonella disease. Vaccine. 2015;33 Suppl 3:C21-C29.
3. Bhutta ZA. Current concepts in the diagnosis and treatment of typhoid fever. BMJ. 2006;333(7558):78-82.
4. Arjyal A, Basnyat B, Nhan HT, et al. Gatifloxacin versus ceftriaxone for uncomplicated enteric fever in Nepal: an open-label, two-centre, randomised controlled trial. Lancet Infect Dis. 2016;16(5):535-545.