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CASE REPORT

An unusual case of extensively drug-resistant (XDR) enteric fever with ARDS

Sabahat Fatima[1], Zoya Yaseen[2], Ayesha Naseer[3], Saima Salman[4], Syed Ghazanfar Saleem[5]

Authors Affiliation

Emergency Department, The Indus Hospital, Karachi, Pakistan[1-5]

Correspondence to:

Sabahat Fatima
sabahatfatima41@tih.org.pk

ABSTRACT

Enteric fever is caused by a gram-negative bacteria Salmonella Typhi or Salmonella Paratyphi type A, B or C. Apart from common gastrointestinal manifestations of enteric fever, septic shock and Acute Respiratory Distress Syndrome (ARDS) are rarely reported complications of enteric fever. We present a case of a 25-year-old female who presented to our emergency department with the complaint of upper abdominal pain and vomiting for 15 days, followed by fever and acute onset of shortness of breath for 1 day. On arrival, she was hemodynamically unstable with oxygen saturation (SpO2) of 85% in room air. After failing a trial of non-invasive ventilation through CPAP, she was electively intubated for mechanical ventilation. CT scan chest showed diffuse bilateral alveolar hemorrhages while blood cultures showed growth of extended drug-resistant (XDR) Salmonella typhi sensitive to carbapenems and azithromycin. The patient remained admitted in ICU for 33 days, improved and discharged. The case highlights the significance of early recognition of respiratory symptoms in patient with enteric fever.

KEYWORDS

Enteric fever, ARDS, XDR Salmonella typhi, Neuropathy, Pulmonary hemorrhage.

INTRODUCTION

Enteric fever is caused by a gram-negative bacteria Salmonella Typhi or Salmonella Paratyphi type A, B or C. According to a study approximately 17 million cases of enteric fever were reported globally in 2015, most of them were in South Asia, Southeast Asia, and sub-Saharan Africa. South Asia has the highest incidence and burden of disease. Untreated enteric fever cases are fatal with 178,000 deaths estimated worldwide. [1] The extended drug resistant (XDR) strain of salmonella is rising in our region. XDR strain of Salmonella Typhi is defined as resistant to all the recommended antibiotics for typhoid fever i.e. (Ampicillin, Chloramphenicol, Trimethoprim-sulfamethoxazole, Fluoroquinolones, Ceftriaxone, and other third generation cephalosporins). According to the recent World Health Organization (WHO) data around 64% of the reported typhoid fever had extended drug resistance (XDR) strain in Sindh out of which 67% were in people living in Karachi.[2]

Enteric fever has a case-fatality rate of 10–30%. This number can be reduced to 1–4% with appropriate management.[3] Complications of enteric fever can involve almost all organ systems. The common gastrointestinal manifestation of enteric fever includes hepatosplenomegaly (35–65%), jaundice (35–65%), GI hemorrhage (25%), intestinal perforation (5–35%) and acalculous cholecystitis (< 5%). [4] ARDS in enteric fever is an extremely rare complication with high mortality ,[5, 6] and to date, very few cases are reported in literature.[7-9] Pulmonary hemorrhage is usually associated with autoimmune disorders and till now it has never been reported with enteric fever.

Herein we are reporting a case of a young female who had complicated enteric fever with ARDS and developed pulmonary hemorrhage followed by critical care neuropathy.

CASE SUMMARY

A 25 years old female, presented to the emergency department (ED) with a history of vomiting for 15 days, which was associated with upper abdominal pain followed by fever and shortness of breath for 1 day. She had worsening shortness of breath which was of acute onset starting a day before visiting hospital. She had no associated history of cough or chest pain. On arrival in the ED, she was hemodynamically unstable. Her blood pressure was 80/40 mm of Hg, heart rate 160 beats/minute, respiratory rate 60 breaths /minute, temperature: 100.2°F and saturation of oxygen at room air was 92%.

On examination she was conscious, oriented in time, place and person but having respiratory distress. General physical examination showed icteric sclerae, tender hepatomegaly, and epigastrium. Her JVP was not raised, and no peripheral edema or limb swelling was noted. Chest auscultation revealed a decrease in air entry in both lung bases with dullness on percussion.

She was given oxygen @ 5lit/min, resuscitated with intravenous (IV) normal saline (NS) 1-liter bolus, Inj. Meropenem 1 g IV after test dose (ATD) was administered within an hour of arrival in ED after sending blood cultures and routine investigations. A portable chest x-ray (CXR) was requested which showed bilateral infiltrates in both lower lung fields (image 1). Arterial blood gas showed type I respiratory failure with raised lactate and a PO of 58 mmHg. The bedside ultrasound abdomen was suggestive of acalculous cholecystitis. After initial management, her blood pressure and tachycardia were improved but her respiratory parameters worsened. She started having a dry cough and was unable to lie flat. Her oxygen saturation worsened and dropped to 85% at 5 lit/min, and her oxygen requirement increased. Her ECG showed sinus tachycardia and bedside echo revealed normal left ventricular function. She was given a trial of non-invasive ventilatory support through Continuous Positive Airway Pressure (CPAP) at 10 cm of H20 but was electively intubated for mechanical ventilation. A gush of blood clots was visualized after endotracheal intubation. Repeat CXR showed diffuse non homogenous infiltrates in both lung fields (image 2). Her blood report showed thrombocytopenia, normal TLC with left shift, and cholestatic picture in liver function test with normal INR, and renal function. Her amylase and lipase were also found to be normal. CT scan chest and abdomen was performed to rule out pulmonary embolism and/or sealed off perforation. CT chest revealed diffuse alveolar hemorrhage with consolidation in both lungs and CT-abdomen was unremarkable except for hepatosplenomegaly (image 3). Her blood cultures showed growth of XDR Salmonella typhi sensitive to carbapenems and azithromycin only.

She had received Cefixime and antimalarial before visiting our department but had no improvement in her symptoms. Her background was remarkable for the use of Nonsteroidal anti-inflammatory drugs (NSAIDs) and steroids over the counter for chronic back pain. She had used prednisolone tapering dose for 2 weeks before presenting complain. She had a history of a caesarean section one year ago. She had no history of drug allergies.

The patient was immune competent, got infected by XDR typhoid and developed ARDS within a day of starting shortness of breath, an extremely rare complication of enteric fever. During the course of her illness, she had to have a tracheostomy, developed critical care neuropathy, and was difficult to wean off mechanical ventilation. After 33 days of mechanical ventilation, she was successfully extubated, her lower limb power was improved from 0/5 to 3/5 and she was able to move around with support and was eventually discharged.

DISCUSSION

Enteric fever has a faeco-oral mode of transmission and is endemic in undeveloped countries owing to overly populated areas with improper sewerage handling.[10] It is more common in younger adults and children, with more than 50% of the isolates found in the patients aged 5-15 years.[11] Our patient was a 25-year-old married female with no prior comorbidities but had a history of steroid use for a short duration which wouldn't render her immune compromised. She had received Cefixime but had no response because she had XDR enteric fever. Extended resistant strains lead to more complication as compare to the antibiotic sensitive organism.

Acute respiratory distress syndrome (ARDS) is defined as "acute onset respiratory failure with PaO2/FiO2 ≤ 300 with PEEP or CPAP ≥5 cm H2O originating within 1 week of a known clinical insult or new or worsening respiratory symptoms, characterized by bilateral opacities – not fully explained by effusions, lobar/lung collapse, or nodules and not fully explained by a cardiac failure of fluid overload".[6, 13] Our patient had acute onset of shortness of breath in the background of XDR enteric fever. She was not maintaining saturation oxygen at room air, had PaO2/FiO2 of 276 and required CPAP of 10 cm H2O and was eventually intubated for mechanical ventilation

Enteric fever is rarely associated with ARDS, our patient had XDR Salmonella enteric complicated with ARDS and pulmonary hemorrhage. Only a few cases are reported to date. To our knowledge, this is the first reported case in the medical literature of a patient with enteric fever developing pulmonary hemorrhage.

Pulmonary hemorrhages are commonly associated with autoimmune disorders. Our patient had been screened for an autoimmune disease, but her serology was negative. She had received three sessions of plasmapheresis during the course of this admission.

It is very alarming to have an increase in the incidence of the XDR strain of Salmonella typhi. The case highlights the significance of early recognition of respiratory symptoms in patient with enteric fever. Though it is rare to have ARDS and pulmonary hemorrhage with enteric fever, the impact should not be underestimated.

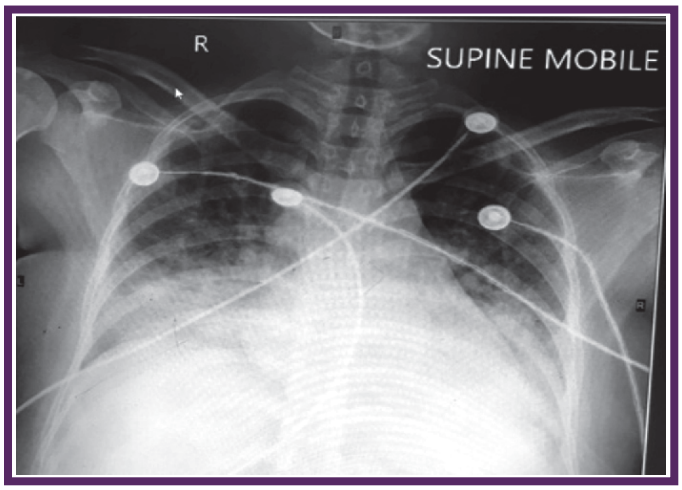

Image 1: Chest radiograph showing non homogenous opacity in both right and left lung lower zone

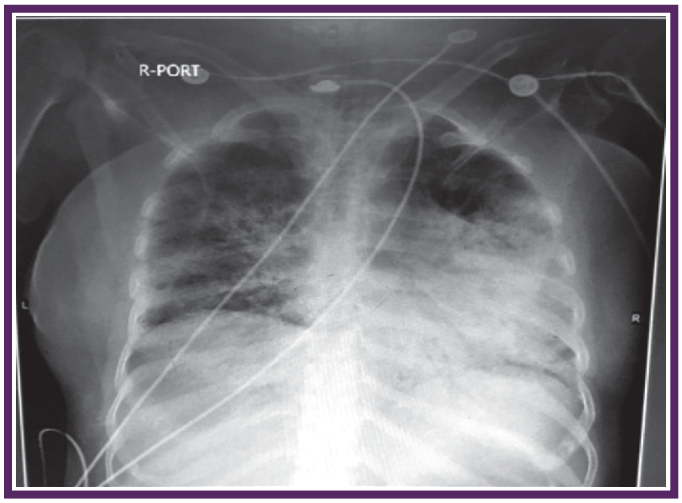

Image 2: Chest radiograph post intubation, showing ETT in-situ and bilateral infiltrates in both lung fields, predominant in left middle zone

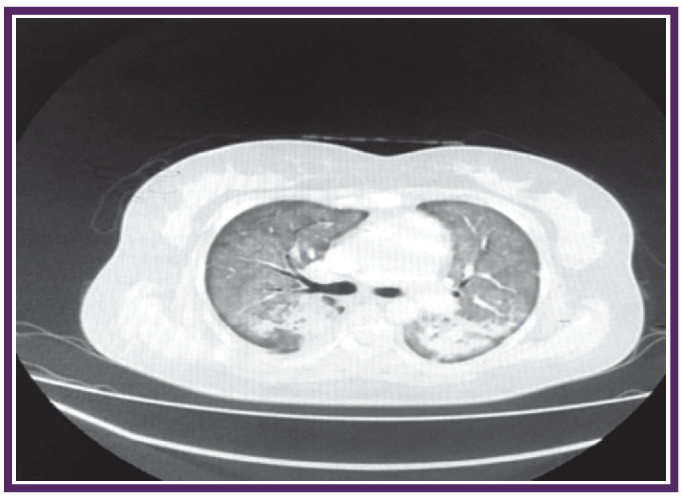

Image 3: CT chest showing infiltrate in both lung field with alveolar hemorrhage in both lungs

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