SPONTANEOUS BACTERIAL EMPYEMA DUE TO SALMONELLA TYPHIMURIUM

RAMIT MAHAJAN RAVIKANT MAHAJAN
Department of Medical Gastroenterology, CHRISTIAN MEDICAL COLLEGE

Abstract:
Spontaneous bacterial empyema is a rare complication of chronic liver disease, mostly caused by Escherichia coli and Klebsiella. We present a case of a 60 year old gentleman with alcohol related decompensated chronic liver disease who presented with a left sided pleural effusion due to Salmonella typhimurium. Salmonella typhimurium is a gram negative bacterium found in the intestinal lumen which presents as enterocolitis, bacteremia or endovascular infections, mostly in immunocompromised states. Pleuropulmonary disease due to Salmonella is extremely rare.

Key Word: Salmonella typhi, pleural effusion

Introduction: Spontaneous bacterial empyema is an infection of a pre-existing hepatic hydrothorax in which pneumonia has been excluded. It is seen in 0.4% of patients with a decompensated chronic liver disease and the most frequent bacteria involved are Enterobacteriaceae (Escherichia coli and Klebsiella pneumonia)(1). Members of the same family, Salmonella typhi and paratyphi are the causative agents for typhoid fever. Non-typhi Salmonella species are known to cause bacteremia, enterocolitis, and endovascular infections, but pleuropulmonary disease is relatively uncommon. A review of the literature of past 100 years published in 2005 could find only 14 cases of empyema due to S.typhimurium and 25 cases due to other nontyphi Salmonella (2).

Case Report: A 60 years old gentleman with an alcohol related decompensated chronic liver disease presented with 20-day history of shortness of breath, dry cough and intermittent fever. He had been admitted elsewhere and had undergone therapeutic thoracentesis for a left sided pleural effusion thrice. There was a history of perinephric abscess requiring pigtail drainage four months prior to admission, the culture results were not available. Examination revealed an obese, pale and icteric man, with grade 2 pitting edema. He was tachypnoeic, using accessory muscles of respiration. There was dullness over the left hemithorax extending up to the angle of scapula, along with corresponding reduction in breath sounds. Abdomen was supple, with no hepatosplenomegaly or free fluid. Investigations revealed...
haemoglobin of 7.9 g/dl with macrocytosis, total leucocyte count of 8,800/mm$^3$ (neutrophils 59%, lymphocytes 24%). Liver biochemical tests revealed unconjugated hyperbilirubinemia (total bilirubin 6.52 mg/dl, direct bilirubin 1.7 mg/dl), hypoalbuminemia (2.8 g/dl) and prolonged prothrombin time (20.8 seconds, INR 1.81). The BUN was 26 mg/dl and creatinine 1.73 mg/dl. Chest radiograph and sonography confirmed the presence of a loculated left sided pleural effusion (Figures 1 and 2 respectively). Ultrasonography revealed features of chronic liver disease with minimal ascites.

At thoracocentesis, turbid serosanguinous fluid was obtained. Fluid was exudative by Light’s criteria, with 15,100 leucocytes/mm$^3$ and 97% neutrophils. Pleural fluid pH was 6.1. Intercostal drainage was deferred due to underlying decompensated chronic liver disease. Empirical piperacillin tazobactum was started in view of the recent thoracocentesis and non availability of cultures from elsewhere. On the third day, pleural fluid culture grew Salmonella typhimurium and a simultaneously withdrawn blood culture grew Enterococcus. Salmonella was sensitive to ampicillin, trimethoprim-sulfamethoxazole, chloramphenicol and ciprofloxacin. A good response was noted on piperacillin tazobactum with more than 25% reduction in cell counts after 48 hours of starting treatment. The patient was discharged at request on fifth day on oral ciprofloxacin and linezolid due to financial constraints. A telephone follow up was done one month after discharge. He was afebrile, less breathless and had restarted working.

**Discussion**

Hepatic hydrothorax is the accumulation of fluid in the pleural space as a consequence of hepatic disorders, and in the absence of cardiac or lung disease. The incidence of hepatic hydrothorax in a cirrhotic patient ranges between 4 to 10% [3,4]. Thirteen percent of the patients with hepatic hydrothorax can develop spontaneous bacterial empyema, often without presence of ascites or spontaneous bacterial peritonitis [1]. Patients with spontaneous bacterial empyema have a case fatality rate as high as 20% [1]. The causative microorganisms in most cases of spontaneous bacterial empyema are Escherichia coli, Streptococcus species, Enterococcus and Klebsiella [1].
Pleuropulmonary infections due to Salmonella are rare. Of the 6250 cases of bacteriologically proven Salmonellosis studied over a period of 12 years in our centre, only 0.05% had pulmonary involvement in form of pyopneumothorax. Cultures grew Salmonella typhi in one case and Salmonella typhimurium in the other two (5). Empyema due to Salmonella has been described in immunocompromised patients with metastatic breast cancer, alveolar cell carcinoma and gallbladder carcinoma (6,7,8). Other diseases that predispose to Salmonella typhimurium septicaemia are leukemia, lymphoma, hemoglobinopathies like sickle cell disease, infections like malaria and HIV (9,10,11,12). A patient with autoimmune hepatitis and hepatocellular carcinoma, on immunosuppressive therapy has been reported to have spontaneous bacterial empyema caused by Salmonella (13). In a study from Thailand, most common causes of non Salmonella bacteremia were HIV and corticosteroid use and only 0.05% of these patients had cirrhosis (14). Patients with pleuropulmonary disease due to non typhoid Salmonella usually present with an acute onset breathlessness and pleuritic chest pain. Pleural fluid, blood and stool cultures aid in diagnosis(2,15,16). Fluoroquinolones and third generation cephalosporins are used for 2-4 weeks, in view of the increasing antibiotic resistance among the non Salmonella typhi infections(17). Drainage of empyema can be done as an adjuvant therapy in non cirrhotics. Relapse after treatment is common and mortality is as high as 15% (18). Our patient had a decompensated chronic liver disease with past history of perinephric abscess drainage and repeated thoracocentesis. Non typhoidal Salmonella can rarely cause perinephric abscesses (19,20). Though the culture reports of previous admissions were not available, urine culture at the present admission was sterile. The report highlights the importance of suspecting unusual infections in patients with advanced liver disease. Culturing blood and body fluids and empirical broad spectrum antibiotics as per resistance patterns of organisms are of prime importance as development of infection in cirrhosis is associated with a significantly higher mortality that has been shown to be independent of the severity of liver disease.

Bibliography:


