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Multiorgan Dysfunction: A Rare Complication of Typhoid Fever

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Typhoid fever is a common infection in children in developing countries. Typhoid fever is a systemic illness which affects many organs. Isolated hepatitis, thrombocytopenia and acute renal failure complicating typhoid fever are well known. The potential of multiorgan involvement in typhoid fever - on rare occasions - may occur simultaneously in the same patient.

Keywords: Typhoid Fever; Hepatitis; Thrombocytopenia

1. Introduction

Typhoid fever is a common infectious disease worldwide especially in developing countries where it is associated with high morbidity and mortality (1). It usually starts as an acute systemic febrile illness without localization and clinically non-distinguishable from other tropical infections (1). In 25% - 30% of cases, typhoid fever is complicated by involvement of one or more major organs of the body (2). Typhoid fever complicated by multiple and simultaneous organ involvement has been rarely mentioned in the literature (2, 3). Although isolated acute renal failure and hepatitis have been reported previously in typhoid fever, their simultaneous occurrence in the same patient is distinctly rare (2, 3). We present a case of typhoid fever complicated by hepatitis, acute renal failure, thrombocytopenia and serosal effusion, whose concurrent occurrence can alert clinicians to this rare and potentially lethal complication of typhoid fever.

2. Case Presentation

An eight-year-old boy presented with one week history of fever, abdominal pain and nausea for four days along with decreased urine output for three days. He had no pain, diarrhea, haematuria, rashes or pyoderma. On examination, he was conscious, sick, toxic, hydrated, pale and jaundiced with puffy face. He was febrile (1020 F), PR 110/min, BP of 94/62 mm Hg and tachypnic (RR 34/m). Abdomen examination revealed 3 cm tender hepatomegaly and 2 cm spleenomegaly. Respiratory system revealed diminished breath sounds on the right hemithorax. In view of sick, toxic, tachypnic and jaundiced child, we considered dengue, *Leptospira*, septicemia and viral hepatitis as differential diagnoses. He was commenced on intravenous Ceftriaxone and crystalline Penicillin. Investigations: Hb 8.9 g/dL, WBC $8.4 \times 10^3/\mu L$ with neutophilia of 75%, Platelets $62 \times 10^3/\mu L$, haematocrit 26% and normocytic and normochromic blood picture. His arterial blood gas and chest X-ray were normal. His serum creatinine was 1.9 mg/dL, blood urea 138 mg/dL, sodium 120 mEq/L, potassium 3.3 mEq/L, total bilirubin 1.9 mg/dL, AST 225 U/L, ALT 105 U/L, Alkaline Phosphatase 832 U/L, serum proteins 5 g/dL, albumin 2.3 g/dL and blood sugar 75 mg/dL. His urine analysis was normal and culture was sterile. Viral Hepatitis markers (A, B, C and E) were negative. His blood culture grew *Salmonella typhi* (*S. typhi*) and Widal test showed raise in T (H) titres of 1:320. His HIV, Paul Bunnel test, Wiel Felix, IgM and IgG antibodies to scrub typhus, QBC for malarial parasite, dark field microscopy for *Leptospira*, dengue and leptospiral serology were negative. Ultrasound revealed hepatomegaly with increased echotexture, moderate ascites, bilateral pleural effusion and increased echogenesity of renal parenchyma suggestive of medicorenal disease grade I. His urine output improved and his renal biochemistry gradually improved over five days. Platelet counts normalized after four days of antibiotics. Jaundice was clinically undetectable after seven days. He became afebrile after nine days of taking antibiotics. The follow-up LFT's, platelets and renal biochemistry became normal within 15 days after post discharge.

3. Conclusions

Typhoid fever is an acute systemic febrile illness caused by *Salmonella typhi* characterized by bacterial invasion

Implication for health policy/practice/research/medical education:
The study is conducted for medical educational purposes.

via Peyer's patches, leading to bacteremia. *S. typhi* may affect all the major systems of the body leading to various complications and can be presented with different clinical symptoms in children. Typhoid may cause a major catastrophe if this treatable disease and potential complications be ignored (3). The potential multiple organ involvement on rare occasions may occur simultaneously in the same patient (2, 3). Asymptomatic hepatitis commonly occurs in typhoid fever, with most patients having only minor elevations of AST and ALT (2). Jaundice is a rare clinical presentation in typhoid and the incidence ranges from 4.8% - 17.6% (1). In fact, LFT may be abnormal even in the absence of clinical jaundice in 21% - 60% of cases (1). Probably, it is due to the interaction between hepatic macrophages and salmonella endotoxins. Although various complications of typhoid fever have been described, ascites and pleural effusions has not been mentioned in the standard text book (4).Only few reports on ascites in typhoid fever are available (4-6). Chiu et al. reported ascites or pleural effusion in 4% out of 71 typhoid children (5). Judet et al. reported ascites in 2 typhoid cases and suggested that typhoid fever in a febrile child should be considered as peritoneal effusion (6). Shinha and Saha thought that ascites being under reported or missed in terms of entric fever (4). Thrombocytopenia in typhoid fever occurs in 10% - 15% of cases and is a sign of severe disease (7). Thrombocytopenia was the most common complication (13%) of typhoid fever noticed in a study by Chiu et al. (5). Renal complications due to typhoid occurs in 2% - 3% of cases and is considered to be rare in children (8). Patients with typhoid glomerulonephritis may be presented with acute renal failure, hypertensive encephalopathy or nephritic syndrome (9). Renal failure in typhoid may be a part of septicemia or shock (9). Given that, hepatitis and nephritis occurring simultaneously in typhoid patients are very rare while it may be more common in HIV positive patients with typhoid fever (9). Probably acute renal failure in our case (HIV negative) is a part of *Salmonella typhi* septicemia. Clinically, typhoid presenting as glomerulonephritis is rare, whereas subclinical glomerulonephritis may be frequent and overlooked (10). The pathogenesis of typhoid glomerulonephritis caused by direct invasion of *S. typhi* and the whole process is immune-mediated (2, 10). Jaundice due to typhoid hepatitis may precipitate the occurrence of typhoid glomerulonephritis. Presence of typhoid nephritis increases mortality between 20% - 30% in untreated typhoid fever (9). The potentially serious renal and hepatic complication of typhoid fever along with thrombocytopenia, which may coexist in the same patient simultaneously, is highlighted in this report. The significance of reporting this case is to reiterate the different clinical spectrum of typhoid fever, mimicking dengue, leptospirosis, viral hepatitis, malaria, HIV and septicemia especially in tropical counties like India can pose a diagnostic problem. On admission, our diagnosis was mainly dengue, leptospirosis, septicemia and viral hepatitis in view of jaundice, renal failure, thrombocytopenia, tachypnoea, ascites and pleural effusion. In dengue and *Leptospira* myalgias, joint pains, rashes, puffiness of face and conjunctival suffusion gives clue to the diagnosis which were absent in our case. Given malaria, fever is abrupt, intermittent with chills and rigor is present. Because of multisystem involvement in a sick toxic child, septicemia and HIV was diagnosed. In fact, typhoid is also a kind of *Salmonella typhi* septicemia. In viral hepatitis, nonspecific prodromal symptoms precede the onset of jaundice and fever usually subsides with the appearance of jaundice. There is mild rise in liver transaminase levels in typhoid hepatitis and this could be different from viral hepatitis where the increase is marked. To conclude, multi organ involvement in typhoid fever - on rare occasions - may occur simultaneously in the same patient. As clinicians, we should know that renal failure and hepatitis complicating typhoid fever may be as common as sepsis or tropical infections. Awareness about rare presentations of typhoid fever as well as its early diagnosis along with prompt treatment can help decreasing the morbidity and mortality.

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Authors' Contribution

K. Jagadish Kumar collected the data and wrote the manuscript.

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