



Hypoalbuminemia and Multi Organ Dysfunction in a Case of Scrub Typhus

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Abstract:

Scrub typhus also known as 'Tsutsugamushi disease' is a mite borne bacterial infection caused by *Orientia tsutsugamushi*. Usually the symptoms are mild and the clinical course is uneventful. However, some patients may experience severe fatal events involving multi organ system. We report a 23 year old patient, admitted with fever, skin lesion and unconsciousness and was diagnosed to have scrub typhus with multiorgan dysfunction and hypoalbuminemia resulting in fatal outcome. The aim of this case report is to reemphasize that hypoalbuminemia with multi organ dysfunction could lead to fatal outcome in scrub typhus.

Key words: Scrub Typhus, Mites, *Orientia tsutsugamushi*, Hypoalbuminemia, Fever.

Introduction

Scrub typhus is an acute, febrile, infectious illness which was first described in China in 313 AD. The characteristic findings of this illness are high fever, eschar, maculopapular rash, lymphadenopathy, headache, and myalgia. Non-specific clinical presentations, limited awareness with low index of suspicion among doctors makes scrub typhus under-diagnosed disease.

Scrub typhus leads to generalized vasculitis which may involve the tissues of any organ system [2,3]. Complications of scrub typhus include interstitial pneumonia, acute renal failure, meningoencephalitis, gastrointestinal bleeding and multiorgan failure. Since patients with scrub typhus may die from such complications, clinicians need to be aware of the severity markers of the disease. Few studies done in the past have reported that hypoalbuminemia and multiorgan failure could be used as markers of severity of the disease [4,5]. We report a case of scrub typhus and the consequences of multiorgan dysfunction and hypoalbuminemia.

Case Report

A 23 year old male was referred to our department with complaint of headache for last 2 weeks. He was running high grade fever since last 5 days. There was no history of bleeding from any site, oral or genital ulcers, seizures, joint pains, swelling or drug intake.

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On examination, patient was found to be febrile with GCS of E₂M₂V₁. His pulse rate was 120/min, and blood pressure was 150/90 mm Hg. There were no palpable lymph nodes or clinical signs of jaundice. Dermatological examination revealed an eschar in right infraaxillary region. He did not have any skin rashes. Abdomen examination was suggestive of hepatomegaly. Central nervous system examination revealed an asymmetrical pupil and neck stiffness. Other systems were within normal limits.

Blood counts revealed a total leucocyte count of 23,500/ μ L with 84% neutrophils and 16% lymphocytes. The hemoglobin, platelet count and serum bilirubin were normal. Smears for malarial parasite were negative. The liver transaminases were elevated: SGOT 170 IU/L, and SGPT 86 IU/L with total protein - 4.0 g/dL, Albumin - 2.1 g/dL and Globulin - 1.9 g/dL. Urine examination revealed 2+ albumin, bile salts and bile pigments. The blood urea was 64 mg% with serum creatinine 1.3 mg/dL. There was marked prolongation of Prothrombin time (PT), Partial thromboplastin time (APTT), and INR [PT was 20 seconds with control of 14 seconds, INR - 1.7, APTT was 50 seconds with control of 30 seconds]. The D-dimer [11.15 μ g/ml FEU (< 0.5)], which indicated lysis of fibrin clot, was also raised suggesting disseminated intravascular coagulation.

The patient was diagnosed as a case of scrub typhus on basis of serology (Positive IgM ELISA) and was treated with doxycycline and additional supportive treatment for DIC, acute respiratory distress syndrome, hepatitis and renal involvement. In spite of aggressive and appropriate treatment the patient could not be saved.

Discussion

Scrub typhus is endemic in 'Tsutsugamushi triangle' which extends from northern Japan and far-eastern Russia in the north, to northern Australia in the south, and to Pakistan and Afghanistan in the west. Scrub typhus is acquired during agricultural exposure, with rice fields serving a reservoir for transmission [1]. It is transmitted to humans by infected chigger, the larval stage of trombiculid mites. The natural reservoir for the chiggers is wild rats and when the chiggers feed on humans, infection occurs.

Our patient of scrub typhus was admitted with a GCS (Glasgow coma scale) of 5 and multiorgan failure- acute renal failure, adult respiratory distress syndrome, hepatic dysfunction, disseminated intravascular coagulation. The root cause of all the complications in scrub typhus is due to the destruction of endothelial cell lining of small vessels which leads to vasculitis. Usually, the cause for hypoalbuminemia in any acute infectious illness is due to poor oral intake of protein, decreased hepatic synthesis and increase protein catabolism. However, in scrub typhus the mechanism of hypoalbuminemia seems to be vasculitis leading to increased vascular permeability and thus protein leakage from blood vessels causing hypoalbuminemia [6].

It has been reported in the past that hepatic dysfunction and septic shock more often occurred in patients of scrub typhus with hypoalbuminemia [7,8]. This shows the close association of hypoalbuminemia with severity of the disease. Vasculitis and perivasculitis of small blood vessels may also lead to multiorgan dysfunction like hepatic dysfunction, cardiac dysfunction, interstitial pneumonia, renal failure, myocarditis and disseminated intravascular coagulation [9]. Few studies have shown that in patients with scrub typhus, hypoalbuminemia, thrombocytopenia and leukocytosis represented the severity of disease. In this case there is leukocytosis, which might show the severity of the disease.

Acute renal failure may be due to direct invasion by *Orientia tsutsugamushi* causing acute tubular necrosis. Chang-Seop Lee *et al* emphasized the role of hypoalbuminemia as a marker for severity of the disease [5]. Hepatic and renal involvement as a part of multiorgan involvement could also contribute to hypoalbuminemia in scrub typhus. It has been shown by Song *et al* that pulmonary edema, interstitial pneumonia and pleural effusion were more often reported in scrub typhus patients with hypoalbuminemia than in scrub typhus without hypoalbuminemia [10].

Our study also reemphasizes the fact that hypoalbuminemia associated with multi organ failure could be a marker of the severity of scrub typhus.

Conclusion

This case report establishes the close relationship of hypoalbuminemia and multiorgan failure with scrub typhus to fatal outcome of the disease.

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