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Spontaneous septicaemia with multi-organ dysfunction - a new face for *Pantoe agglomerans*?

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ABSTRACT

Pantoe agglomerans (*P. agglomerans*) is an unusual cause for sepsis in immunocompetent individuals, especially in the absence of characteristic risk factors. We report one such case occurring in a farmer, manifesting with severe illness. The severe nature of illness and the apparently spontaneous origin of septicemia underline the pathogenic potential of this organism. When coupled with the ubiquity of the organism, there is a definite possibility that this disease may become increasingly frequent in the near future, especially in agronomic countries like India. Further studies on the epidemiology and natural history of this disease are required.

1. Introduction

Pantoea agglomerans (*P. agglomerans*) is a free-living bacterium commonly isolated from soil and plants. It is a gram-negative bacillus of the family Enterobacteriaceae. *P. agglomerans* infection in humans is rare and often results from wound contamination or nosocomial infection[1] related to intravenous catheters or contaminated intravenous fluids.

2. Case report

A 35-year-old premorbidly healthy farmer presented with fever and vomiting since three days and delirium since one day. At admission, he was in shock with a systolic blood pressure of 80 mmHg. General examination revealed petechiae over his limbs, ecchymoses at sites of intravenous blood sampling and bilateral sub-conjunctival hemorrhages. Neurological examination was unremarkable. Routine laboratory parameters showed bicytopenia (TLC:2 500/mm^3, platelets:18 000/mm^3), prolonged clotting parameters (PT:37.5 secs, control:15.3 secs, INR:2.68; aPTT:75.1 secs, control:34.3 secs) and 34% bands in the peripheral smear. Liver and renal function tests were abnormal (Total bilirubin:4.6 mg/dL, direct bilirubin:3.5 mg/dL,AST:1025 U/L, ALT:382 U/L, urea:54 mg/dL, creatinine:2.2 mg/dL). Serum procalcitonin levels were grossly elevated (>100 ng/mL). The overall picture was suggestive of multi-organ dysfunction with disseminated intravascular coagulation, probably secondary to bacterial sepsis. Parenteral broad-spectrum antibiotics were initiated, pending blood culture reports. While in hospital the patient had a bout of haematemesis; it was managed in consultation with gastroenterologists, with transfusions of packed cells, fresh frozen plasma and platelets. Elective intubation was performed for airway protection.

Blood cultures drawn at presentation yielded a growth of gram-negative bacilli, subsequently identified by ID-32E system (BioMerieux) as *P. agglomerans*. The patient was switched to intravenous ceftriaxone according to the sensitivity pattern of the isolate. He made a steady recovery and was extubated. Serial monitoring confirmed complete resolution of thrombocytopenia, hepatitis and renal failure. Careful questioning failed to elicit history of antecedent trauma. Investigations for other causes of fever including enteric fever, malaria, leptospirosis and scrub typhus

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were negative. HIV serology by ELISA technique was also negative.

3. Discussion

P. agglomerans is an infrequent cause of human disease, and mostly limited to cases with predisposing factors such as infusion of contaminated intravenous fluid or wound contamination with soil or plant material[2]. This feature suggests that direct inoculation into the bloodstream is required to produce disease. This pattern is further supported by findings in a study by Cruz3 wherein 21 of 53 patients with *P. agglomerans* infection had catheter-related bloodstream infections. Rodrigues *et al* [4] reported a case of *P. agglomerans* producing liver abscess following appendectomy, again raising the possibility of contamination of the surgery by *P. agglomerans*.

Significantly, our patient possessed none of these risk factors. Repeated enquiry failed to elucidate history of recent trauma or wound infection. Furthermore, *P. agglomerans* was isolated from blood cultures drawn prior to institution of medical therapy, obviating possibility of nosocomial infection.

Being a farmer, our patient was accustomed to wading in muddy water and plant material - an obvious reservoir of *P. agglomerans*. In such circumstances, *P. agglomerans* might plausibly be capable of directly penetrating human skin, perhaps through areas of microtrauma. If this were true, there is a distinct and disturbing possibility that *P. agglomerans* infection may become increasingly frequent in the future, given the large population of agricultural workers at risk of infection, and the ubiquity of the organism within the environment.

The severity of disease in our patient is also noteworthy, especially considering his immunocompetence. Previously reported cases of *P. agglomerans* infection were predominantly encountered in the neonatal[5-9] and pediatric population[3], patients with chronic kidney disease[10-13], adults on chemotherapy[14] with depressed immunity or individuals with lympho-reticular malignancies[15,16]. These infections were clinically characterized by acute febrile episodes with minimal organ involvement. In this regard, there is also the question of whether the severe nature of infection encountered in our case was triggered by a florid immune response, akin to that observed in Weil's disease. Questions such as this can only be answered by larger studies on the epidemiology and natural history of *P. agglomerans* infection.

Conflict of interest statement

We declare that we have no conflict of interest.

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