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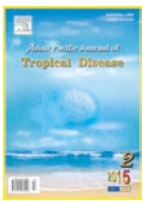

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Nontyphoidal salmonellosis and multiple ring enhancing lesions in the brain of an HIV infected adult: a diagnostic dilemma

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To the editor,

Nontyphoidal salmonellae (NTS), especially *Salmonella enterica* serovars typhimurium and enteritidis, are a major cause of invasive bacterial diseases affecting young children and HIV-infected adults with high mortality and recurrence rates[1]. Co-infection with NTS and tuberculosis has rarely been reported from India. We report a case of NTS bacteraemia with intracranial tuberculomas in an HIV-infected adult.

A 35-year-old male with no premorbid illness presented to our tertiary care centre with fever for 1 week and headache, vomiting, right sided weakness and altered sensorium of 1-day duration. On examination, he was moderately built, afebrile, blood pressure was 150/90 mm of Hg and pulse rate 112 beats/min. Neurological examination showed slight altered sensorium, mild weakness of right half of the body, right sided hypertonia with extensor plantar response and neck rigidity while other systemic examination was unremarkable. Fundus examination showed early papilledema. Lumbar puncture for cerebrospinal fluid analysis was deferred due to raised intracranial pressure. Laboratory investigations revealed hemoglobin concentration of 9.3 g/dL, leukocyte count of 5 700 cells/mL with 63% neutrophils, 14% lymphocytes, 13% bands and 10% monocytes and platelet count of 1.35 lakh cells/μL. His random blood glucose was 113 mg/dL and erythrocyte sedimentation rate was 95 mm/h. He was tested positive for HIV antibody while toxoplasma serology was negative. His liver and renal function, chest skiagram and ultrasonographic examination of abdomen were normal. With suspicion of bacterial meningitis, empirical therapy was started with intravenous ceftriaxone 2 g Q12h along with other supportive measures. A cerebral CT scan obtained on Day 2 of admission showed multiple ring-enhancing lesions in the left frontoparietal and basal ganglia region (largest measuring 2.9 cm×1.6 cm) with significant perilesional edema causing significant mass effect suggestive of tuberculoma or abscess. The findings were later confirmed with magnetic resonance imaging of brain. However, tuberculin skin test was negative. Four first-line anti-tubercular drugs were then added. Blood culture (BacT Alert 3D system) that was done at admission yielded *Salmonella enterica* serotype enteritidis after 2 d. The bacterium was

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susceptible to ampicillin, ceftriaxone, chlorapmphenicol, trimethoprim-sulfamethoxazole and resistant to nalidixic acid and ciprofloxacin by Kirby-Bauer disc diffusion test[2]. Possibility of intracranial infection as a result of NTS bacteraemia was then thought of and thereby treatment with ceftriaxone was continued. His condition worsened even after 10 d of therapy and he developed right sided hemiplegia and aspiration pneumonia. He could not afford further hospital care and was lost to follow up.

Risk factors for primary NTS bacteremia, without associated diarrhea are immunosuppression due to disease, steroid use, malignancy, chronic renal or liver disease, diabetes, sickle-cell disease and elderly and newborn patients[3]. Dysregulated humoral immunity to NTS makes these individuals more susceptible to invasive infections[4]. The case reported here presented with primary bacteremia by *Salmonella* enteritidis without preceding gastroenteritis. Bacteraemia might have led to development of cerebral lesions as well.

The incidence of intracerebral tuberculomas in patients with HIV ranges from 1%-10%[5]. Neuroimaging findings in the present case was suggestive of tuberculoma or tubercular abscess as imaging is not specific enough to consistently distinguish tuberculoma from tuberculous brain abscess[6]. Atypical presentations of intracranial tuberculomas can be a challenging diagnosis, particularly in HIV-infected patients from developing countries, where tuberculosis is endemic[7]. In the absence of stereotactic biopsy result and negative serology for toxoplasmosis, the multiple central nervous system lesions were considered to be tuberculomas while the presence of single lesion with ring enhancement; large size and rapid evolution make the diagnosis of tuberculous abscess more likely[5].

With relatively insufficient neuroimaging findings followed by isolation of NTS from the blood, the management of the presented case became more complex. Clearance of bacteraemia could not be assessed as the blood culture was not repeated. Deterioration occurred in spite of 10-day therapy with ceftriaxone that might be due to coexisting tuberculomas and immunosuppression. Such cases should be given a trial of anti-tubercular therapy along with the management of other infections if any in a tuberculosis endemic country like India. In presence of contraindication to perform lumbar puncture and inadequate diagnostic facilities to reach definitive diagnosis, starting anti-tubercular therapy may alter the outcome. HIV-infected individuals with advanced disease are vulnerable to multiple opportunistic infections. Coexistence of multiple infections in those individuals is sometimes challenging and demands expertise to plan their management.

Conflict of interest statement

We declare that we have no conflict of interest.

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