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Salmonella typhimurium meningitis in an adult patient with AIDS

K Swe Swe,¹ G Nagel,² M Van der Westhuizen,² A A Hoosen¹

ABSTRACT

Salmonella meningitis is an unusual complication of *Salmonella* sepsis and occurs mainly in children. A rare case of *Salmonella typhimurium* meningitis occurring in an adult HIV positive man who presented with a history of fever and diarrhoea is reported. On examination he was dehydrated, and had oral thrush, weakness of lower limbs and neck stiffness. A septic diagnostic screen was performed and he was commenced on empiric intravenous cefotaxime therapy for meningitis. *S typhimurium* was cultured from cerebrospinal fluid and blood culture specimens. It was non-lactose fermenting, oxidase negative, H₂S positive and motile. Cefotaxime was continued for 14 days and the patient responded without neurological sequelae.

We report a rare case of *Salmonella typhimurium* meningitis in a male patient in his 40s who was immunocompromised; he presented with fever, diarrhoea and neck stiffness to a regional hospital.

On examination, he was pale, dehydrated and confused, and had fever, oral thrush, weakness of lower limbs and neck stiffness. His temperature was 38.5°C; blood pressure 88/40 mm Hg; pulse rate 120 beats/min and respiratory rate 28 breaths/min. Specimens were collected for a septic screen which included a blood culture, cerebrospinal fluid (CSF) examination, as well as a full blood count, CD4 count and viral load. Stool and urine specimens were not collected. A clinical diagnosis of meningitis was made, and the patient was started on intravenous cefotaxime (3 g initial dose, followed by 2 g every 6 hours, ie 8 g/day).

A review of the patient's records indicated that he had been treated for pulmonary tuberculosis four months previously. There was no record of his HIV status or whether he had received antiretroviral treatment.

The laboratory results showed low haemoglobin (97 g/l), normal white cell count ($9.4 \times 10^9/l$ with 89.1% neutrophils), high platelet count ($427 \times 10^9/l$); absolute CD4 count of $2 \times 10^6/l$ and a viral load of 99 658 RNA copies/ml (Nuclisens, BioMerieux, France). CSF analysis revealed a turbid appearance with polymorpho-neutrophils of $8965/mm^3$, red blood cells $495/mm^3$ and no lymphocytes. Total protein was raised at 2.98 g/l; there was low glucose (0.3 mmol/l) and low chloride (103 mmol/l). CSF and blood cultures yielded a pure growth of a Gram-negative bacillus which was identified as *Salmonella* sp by the Api 20 E (BioMerieux) and agglutinated with serogroup B (Wellcolex, Remel, UK). It was identified as *S typhimurium* by serotyping at the National Institute of Communicable Diseases, South Africa. It did not

ferment lactose or sucrose, but fermented glucose. It was motile, oxidase negative, H₂S positive and ornithine reaction positive.¹ Microbiological evidence suggested infection with *Salmonella* group B, serotype *S typhimurium* meningitis and septicaemia.

Disc diffusion susceptibility testing (Kirby Bauer) showed the isolate to be susceptible to cefuroxime, cefotaxime, ceftriaxone, ciprofloxacin, and chloramphenicol, but resistant to ampicillin and cotrimoxazole. The patient was treated for 14 days with cefotaxime (3 g initial dose, followed by 2 g every 6 hours, ie 8 g/day) during which time he became afebrile, well orientated and ready to be discharged for continued care at a hospice.

Non-typhoidal salmonella (NTS) infections are frequently associated with animal reservoirs and originate from ingestion of contaminated food products or water.¹

S typhimurium is usually associated with self-limiting gastroenteritis in immunocompetent persons. The mean duration of carriage of NTS in the stool is 4–5 weeks and varies by *Salmonella* serotype; almost all chronic carriers are adults.¹ The organism can spread to the bloodstream and rarely to the meninges in immunocompromised persons. In the case report by Ellis *et al*, the patient was elderly and diabetic, predisposing to the infection.²

HIV infected persons have a 20–100-fold increase risk of salmonellosis, including fulminant diarrhoea, acute enterocolitis, rectal ulceration, recurrent bacteraemia, meningitis, and death, despite appropriate antimicrobial therapy, compared to immunocompetent persons. Focal infections are infrequent among HIV-infected persons, most occurring among those with CD4 counts of $<100/mm^3$.¹

Central nervous system (CNS) infections occur in approximately 0.1–0.9% of NTS cases.³ *Salmonella* meningitis is rare in an adult patient, even in tropical areas where salmonellosis is common.⁴ The three serotypes most commonly associated with meningitis include *S enteritidis*, *S paratyphi* B and *S typhimurium*, with the latter commonly occurring in children <1 year of age.⁵

With regard to meningitis in adults, 17 cases of NTS have been reported. Seven of these have been in HIV positive persons, but none had infection due to *S typhimurium*.^{6,7} In the remaining 10 cases in which the HIV status was unknown, two were associated with *S typhimurium*.^{8,9} In these two cases the underlying problem was a traumatic fracture of first lumbar vertebrae and postoperative wound infection for removal of a cerebral meningioma. These were associated with direct transmission of the organisms. The food source of the organism

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Take-home messages

- ▶ A rare complication of *Salmonella typhimurium* meningitis in an HIV positive adult patient is reported.
- ▶ The patient responded to treatment with intravenous cefotaxime.

was not found in our patient. However, we believe this is a gastrointestinal infection with subsequent spread to the CSF. Standard infection control measures were followed while the patient was hospitalised.

We have presented an unusual case of meningitis in an immunocompromised adult who had a CD4 count of $2 \times 10^6/l$ and presented with diarrhoea. The patient, despite poor immune status, responded to appropriate antimicrobial therapy and was discharged without any neurological complication.

Competing interests: None declared.

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