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Case Report

A rare case of meningitis due to *Salmonella typhi* in a nine month old infant

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ABSTRACT

Salmonella typhi is a rare cause of bacterial meningitis in infants accounting for 1% or less of cases. We report a rare case of meningitis in a nine-month-old baby due to *Salmonella typhi*. A nine-month-old female was admitted to our tertiary care hospital, with a week's history of fever with rigors and refusal to take feeds.

Keywords: Infants, Meningitis, *Salmonella typhi*

INTRODUCTION

Salmonella meningitis accounts for a very small proportion of all bacterial meningitis cases. The serotypes commonly encountered include *S. typhimurum*, *S. paratyphi* B *and S. typhi*.[1] *Salmonella typhi* is a rare cause of bacterial meningitis in infants accounting for 1% or less of cases.[2]

It has been recommended that Salmonella meningitis should be treated with a third-generation cephalosporin and the therapy should be prolonged for a minimum of three weeks.[3] There are several possible reasons for the high mortality and neurological damage. Salmonella is a facultative intracellular micro-organism hence inadequate drug penetration may result in progression of infection.[4,5] We report a rare case of meningitis in a nine-month-old baby due to *Salmonella typhi*.

CASE HISTORY

A nine-month-old female was admitted to our tertiary care hospital, with a week's history of fever with rigors and refusal to take feeds. Mother observed episodes of abnormal movements a day prior to admission. The child was irritable at the time of admission and had three episodes of generalized seizures after admission. There was no history of diarrhoea, vomiting, jaundice, ear discharge or yellowish discoloration of urine. The child was immunized timely as per the national immunization schedule. Diet history revealed that the child was on top feed since birth comprising of pasteurized milk as well as fresh cow's milk.

On physical examination, the baby was found to be under nourished and was not alert, with a temperature of 99°F. There was some degree of neck stiffness. However, examination of her cardiovascular and respiratory system did not reveal any abnormality. Her abdomen was also soft with no organomegaly.

Haematological workup showed her haemoglobin to be 5.2gm/dl, total leucocyte count was 3020 cells/cumm, with 30% neutrophils, 60% lymphocytes, 8% monocytes and 2% eosinophils. CSF analysis revealed 52mg/dl of glucose and 141.6 mg/dl of micro protein.

Her serum potassium, serum sodium, serum calcium, serum creatinine and serum urea were all within normal limits. On Gram staining of CSF, few Gram-negative bacilli were observed. The child was started empirically on intravenous Ceftriaxone 250 mg 12 hourly, after collecting blood sample for culture and CSF for cytological, biochemical and microbiological evaluation. Blood culture was found to be sterile after five days of incubation using automated BacT/Alert system (bioMerieux). CSF was also incubated in automated BacT/Alert system (bioMerieux) and was found to be positive within twenty-four hours. On subculture on blood agar and MacConkey agar, growth of non-lactose fermenting colonies was observed.

The organism grown was motile Gram negative bacilli. The colonies were oxidase negative and catalase positive. The pathogen was identified by automated system (VITEK2 compact, bioMerieux) and confirmed serologically to be *Salmonella typhi*. With MIC of <=1, <=2, 8, <=20 the isolate was found to be sensitive to ceftriaxone, amikacin, ampicillin and cotrimoxazole respectively.

Since the infant was already put empirically on ceftriaxone and was afebrile, no change in antibiotic regimen was carried out. On follow up the child was found to be responding well to the treatment with no fresh episodes of seizures. The mother had no evidence of fever, diarrhoea, or breast lesions. To look for a source of infection the baby's mother was also investigated. Blood culture and stool cultures from mother's specimen were studied but did not reveal any pathogen.

DISCUSSION

Salmonellosis is a common infection in developing countries, mainly due to contaminated food and water. Enteric fever accounts for a major portion of pyrexia of unknown origin in India. But neonatal meningitis due to Salmonella is a rare entity with few cases reported worldwide.[3-9]

In the present case after carefully ruling out mother as a carrier, the source of infection was presumed to be the unpasteurized fresh cow's milk. In India there is a prevalent practice of diluting milk with tap water so as to avoid constipation in the infant. Unpasteurized milk is also exposed to contamination by the cow handlers in lot of unhygienic manners. In the present case, though the cow's milk was being boiled prior to consumption, but for the baby it was being diluted after cooling with tap water. Since the baby was weaned off and was also on semi solid feed, therefore another source of infection cannot be ruled out. Studies suggest that infants who developed neurological complications as a result of Salmonella meningitis had significant mortality and adverse long-term neurodevelopment outcome.[4,10] An early diagnosis and timely treatment has led to recovery of the infant in the present case. However, long term neurodevelopmental follow-up is needed.

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REFERENCES

1. Coovadia VM, Ori S, Bhamjee A. *Salmonella typhi* meningitis- A case report. S Afr Med J. 1983;64:28-9.
2. Elizabeth PH, de Louvoisb J, Rella WM. Antibiotics for salmonella meningitis in children. J Antimicrob Chemother. 2000;46(5):653-5.
3. Cooke FJ, Ginwalla S, Hampton M.D, John W, Farrington M, Ross-Russell R, et al. Neonatal report of neonatal meningitis due to Salmonella enterica Serotype Agona and review of breast milk-associated Salmonella Infections Clin. Microbiol. 2009;47:3045.
4. Kinsella TR, Yoger R, Shulman ST. Treatment of salmonella meningitis and brain abscess with the new cephalosporins: Two case reports and a review of literature. Paediatr Infect. Dis. J. 1987;6:476-80.
5. Torrey S, Fleisher G, Jaffa D. Incidence of Salmonella bacteremia in infants with salmonella gastroenteritis. J.Pediatr. 1986;108:718-25.
6. Kumar JD, Ramachandran P, James SS, Subbarao P, Kumar TK. A rare case of Salmonella typhi meningitis in a two-month-old infant: A case report. Paediatric Infectious disease. 2014;6:97-8.
7. Nwadike VU, Fowotade A, Tuta KE and Olusanya OO. A rare case of Salmonella typhi meningitis in an eleven month old infant: a case report. Ann Ibd. Pg. Med. 2012;10(1):38-9.
8. Lee WS, Puthucheary SD, Omar A Salmonella meningitis and its complications in infants. J Paediatr Child Health. 1999;35(4):379-82.
9. Visudhiphan P, Chiemchanya S, Visutibhan A. Salmonella meningitis in Thai infants: clinical case reports. Trans R Soc Trop Med Hyg. 1998;92(2):181-4.
10. Fiona J. Cooke, Sara Ginwalla, Michael D. Hampton, John Wain, Robert Ross-Russell, Andrew Lever. Report of Neonatal Meningitis Due to Salmonella enterica Serotype Agona and Review of Breast Milk-Associated Neonatal *Salmonella* Infections. JCM. 2009;47(9):3045-9.

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