

## Case Report

## ***Salmonella typhimurium* Meningitis in a Five-Month-Old Infant**

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### ABSTRACT

Non-typhoidal salmonellae are infrequent causes of childhood meningitis. Most reports of *S. typhimurium* meningeal infections are confined to neonates. A rare instance of *S. typhimurium* meningitis in an otherwise healthy five month old infant is being reported.

KEYWORD: infant, meningitis, *Salmonella typhimurium*

### INTRODUCTION

It is well known that *Haemophilus influenzae* type b, pneumococcus and meningococcus together constitute 85% of the causative agents of pyogenic meningitis in otherwise healthy children beyond the neonatal period<sup>[1]</sup>. Reports of members of the *Enterobacteriaceae* family, especially non-typhoidal salmonella as the etiological agents for pyogenic meningitis, are scarce. Of the few available reports, almost all are limited to neonates. Two reports of hospital acquired epidemics in neonatal units caused by *Salmonella typhimurium* (*S. typhimurium*) came from India<sup>[2,3]</sup>. The babies had diarrhoea and sepsis as the predominant manifestations. Neonatal meningitis due to *S. typhimurium* has recently been reported from Turkey<sup>[4]</sup>. A search in the world literature has revealed scanty reports of *S. typhimurium* meningitis beyond the neonatal period and this particular case is being reported on account of its rarity.

### CASE REPORT

A 5-month-old male infant was admitted with fever and vomiting of three days' duration. Activity and feeding were poor and he had episodes of incessant crying on the day of admission. There was no history of convulsions. Preceding gastrointestinal symptoms were absent in both the child and his close contacts. The infant was sick with a tense, bulging anterior fontanelle. A lumbar puncture revealed turbid cerebrospinal fluid (CSF), with a total WBC count of 1100/mm<sup>3</sup>, of which 62% were neutrophils. CSF protein was elevated to 305 mg/dl and the sugar was 20 mg/dl, when the concurrent blood sugar was 90 mg/dl. CSF grew *Salmonella typhimurium* sensitive to ceftriaxone,

chloramphenicol and ciprofloxacin. It was resistant to ampicillin. The characteristic black coloured colonies of *S. typhimurium* were grown on Xylose-Lysine-Decarboxylase (XLD) medium (Fig. 1). ELISA test for antibodies against human immunodeficiency virus was negative. Treatment was initially started with ampicillin and ceftriaxone. On the third day, ampicillin was substituted for chloramphenicol on receiving the sensitivity report.

Fever and CSF abnormalities persisted till the fourth day, but there were no seizures. Thereafter, the child gradually improved. Intravenous antibiotics were continued for four weeks and the child was discharged. CSF analysis and CT scan of head done at discharge were normal. He is under follow-up since six months, and has attained age-appropriate developmental milestones.

### DISCUSSION

*Salmonella* species are ubiquitous human and animal pathogens. They are motile, non-encapsulated gram negative bacilli of the *Enterobacteriaceae* family. Among them, *S. typhimurium* belongs to serogroup B. Non-typhoidal salmonellosis is reported to be common in the United States and interestingly, *S. typhimurium* is the most frequently encountered organism<sup>[5]</sup>. In fact, the largest epidemic of *S. typhimurium* in history occurred in Chicago in 1984. Approximately two hundred thousand individuals acquired the infection from contaminated pasteurized milk<sup>[6]</sup>. However, the scenario is totally different in Asia. The two previous reports deal with diarrhoea epidemics in neonatal special care units<sup>[2,3]</sup>. Meningitis due to *S. typhimurium* beyond the neonatal period has seldom been reported.

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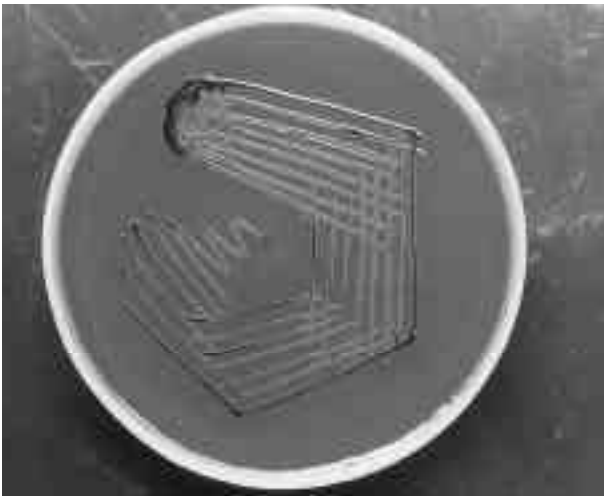


Fig 1: Characteristic black coloured colonies of *S.typhimurium* grown on XLD medium

Infection is almost always by the feco-oral route. The source of infection could not be traced in this infant as there was no history of contact with pet animals or poultry. Salmonella, after entering the blood stream, have a unique capability to metastasize and cause a suppurative infection in almost any organ, most commonly bones and meninges<sup>[7]</sup>. Focal infections including brain abscess and empyema, have been reported in the literature<sup>[8]</sup>.

*S. typhimurium* meningitis differs considerably from other cases of pyogenic meningitis in children. 50-75% of cases occur in the first four months of life<sup>[7]</sup>. The disease is characterized by a high incidence of complications, especially in neonates<sup>[9]</sup>. Acute hydrocephalus, seizures, ventriculitis, abscesses, subdural empyema and long term neurological sequelae are known to occur in most

cases<sup>[7]</sup>. A high incidence of relapse has been noted, especially in children less than two months of age<sup>[7]</sup>. It is recommended that salmonella meningitis should be treated with a third generation cephalosporin and the therapy should be prolonged, for a minimum of three weeks<sup>[10]</sup>. Treatment with ampicillin and chloramphenicol has been associated with lower cure rates and higher relapse rates, and are best avoided<sup>[10]</sup>.

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