

## *Salmonella typhi* Meningitis with Facial Nerve Palsy

S. Suri  
A. Bhasin  
V.K. Srivastava

*Salmonella* meningitis in childhood is uncommon, the reported occurrence in all salmonella ranging from 0.1-6%, with over three-fourths occurring during infancy(1). *S. typhi* meningitis is even more uncommon(0.1%)(2). We report here an 11-year-old boy who developed *Salmonella typhi* meningitis with left lower motor neuron facial palsy, which has probably never been reported before in children.

### Case Report

An 11-year-old boy was admitted in the Pediatrics Unit of Safdarjang Hospital with history of fever and vomiting for five days and altered sensorium for one day. There was no history of head injury or ear discharge. The past and family history were insignificant. On physical examination, he was irritable, febrile (39.5°C) and toxic, with pulse rate of 108/min, respiratory rate of 28/min, and blood pressure of 90/60 mm Hg. Neurological examination revealed left lower motor neuron facial nerve

palsy with neck rigidity and positive Kernig sign. In addition, there was soft hepatomegaly of 2 cm and soft and tender splenomegaly of 1.5 cm. Examination of other systems including fundoscopy, was normal.

Investigation revealed a hemoglobin of 12.5 g/dl, total leucocyte count of 3,000/cu mm with 55% polymorphs and 45% lymphocytes; serum agglutinins against O and H antigen of *Salmonella typhi* were positive in the titer of 1 : 256, but negative against paratyphi A and B. Cerebrospinal fluid (CSF) examined at admission was clear, under normal tension, with a WBC count of 15/cu mm (80% polymorphs), negative Gram stain, protein of 42 mg/dl and sugar 40 mg/dl against a blood sugar of 100 mg/dl. CSF and blood culture grew *Salmonella typhi* with an identical sensitivity pattern to chloramphenicol, streptomycin, gentamicin, kanamycin and cephalexin. The urine culture was negative, while stool culture grew normal flora. Chest roentgenogram was normal.

The patient was treated with parenteral ampicillin and chloramphenicol for fourteen days. He had rapid improvement in all clinical parameters. Repeat CSF examination on day 14th of the hospital stay was normal, and culture was sterile. The child had no neurological deficit on discharge. On evaluation after 15 days, one month and three months, the child continued to be in good health and without any neurological sequelae.

### Discussion

*Salmonella* meningitis is rare. The first case was described by Ghon in 1907(3). Since then a number of reports have appeared in the literature(4,5). While *S. typhimurium*, *S. enteritidis* and *S. paratyphi* have been relatively frequent causative

From the Department of Pediatrics, Safdarjang Hospital, New Delhi 110 029.

Reprint requests: Dr. V.K. Srivastava, Professor and Head of Unit, Safdarjang Hospital, New Delhi 110 029.

Received for publication: December 31, 1990;

Accepted: October 31, 1991

agents, *Salmonella typhi* has been infrequently incriminated(2,5).

In 1904, Cole(6) defined the spectrum of meningitis occurring during typhoid fever: (i) Meningismus, in which the spinal fluid is normal; (ii) Serous meningitis, in which *Salmonella typhi* is grown from the spinal fluid, but the cellular response is minimal and predominantly mononuclear; and (iii) Purulent meningitis, in which the cellular response is intense and neutrophilic and the organism is grown from the spinal fluid. Purulent meningitis is rare in comparison to the other two forms.

Meningitis frequently causes transient nerve deficits, particularly involving oculomotor and abducens nerves. Facial nerve paralysis is unusual(7), and its presence in *Salmonella typhi* meningitis has never been reported before in children although it has been reported in an adult(8) and a child with *Salmonella newport* meningitis(4). The exact cause of cranial nerve deficits is unclear, but it is presumed to be due to involvement of these nerves by meningeal exudates(9).

Chloramphenicol and ampicillin have been the accepted drugs of choice(8), though co-trimoxazole cephalosporin and chlortetracyclin hydrochloride have also been used, with variable success(8). However, with the recent emergence of multiple resistant strains of *Salmonella typhi* in developing countries, newer cephalosporins such as Cefarmandole or Ceftriaxone could be considered.

*S. typhi* meningitis was universally fatal till Hageman in 1938 reported the first survival. The most important factors determining the prognosis are the age of the patient and the promptness of treatment(10). Although *Salmonella typhi* meningitis is very uncommon, and the association of facial nerve palsy in children has not been

reported earlier, this diagnosis should be considered in a patient from an endemic area presenting with fever with or without signs of meningeal irritation.

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