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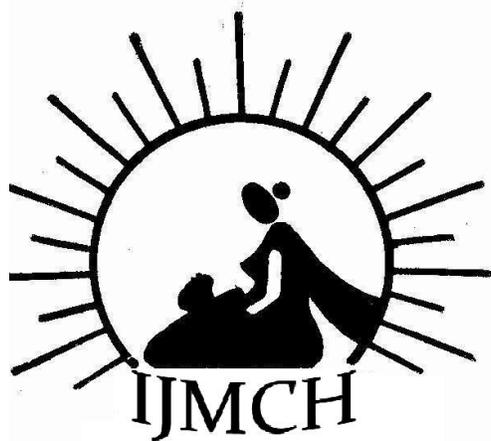
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Salmonella enteritidis a foodborne pathogen causing serious bacteremia, meningitis with sequelae in infancy is rare.

Hemiparesis and thrombocytopenia caused by *Salmonella enteritidis* meningitis in a four month old infant

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ABSTRACT: *Salmonella enteritidis* a foodborne pathogen causing serious bacteremia, meningitis with sequelae in infancy is rare. Here we report a four month old infant who presented with severe bacteremia ,thrombocytopenia, meningitis and hemiparesis caused by *salmonella enteritidis*. So far there has been no case reports of hemiparesis caused by *Salmonella enteritidis* .

INTRODUCTION: Nontyphoidal *Salmonella* are important foodborne pathogens that cause gastroenteritis. Of these approximately 5% will develop bacteremia, a serious and potentially fatal problem¹. *Salmonella* strains account for 1% or less of the confirmed cases of bacterial meningitis in neonates and infants.^{1,2} Bacteremia is more likely to occur in young infants and immunocompromised patients .These hosts are also more likely to develop focal infections like meningitis, septic arthritis, osteomyelitis, cholangitis, and pneumonia². *Salmonella* meningitis in neonates and infants had a wide spectrum of morbidity and acute complications, leading to a complicated hospital course and subsequently a high prevalence of permanent adverse outcome.

CASE: A four month old female infant presented with fever, poor feeding and lethargy associated with inconsolable crying for 3 days. Birth history and family history were unremarkable. She was immunized for the age and development was age appropriate. On examination she was conscious (GCS 12/15), with heart rate of 140/min, respiratory rate 28/min, and blood pressure 80/50 mmHg. Anthropometric measurements were Weight 6kgs, length 58cms and Head circumference 41cms. She was febrile, irritable and inconsolable. Anterior fontanelle was tense & bulging. No neurocutaneous markers were present. The facies were not dysmorphic . Central nervous system examination revealed generalized hypertonia, hyper-reflexia with no focal deficits/ cranial nerve abnormality. There were no meningeal signs. The fundus, ENT examination was normal. There was significant hepatosplenomegaly. Otherwise systemic examination was unremarkable. She was admitted with working diagnosis of septicaemia with meningitis.The infant was started on intravenous ceftriaxone and amikacin, before blood and cerebrospinal fluid(CSF) was sent to the laboratory for culture. Gram staining of CSF revealed gram negative bacilli. *Salmonella enteritidis* was identified from both blood and CSF by standard biochemical tests which was confirmed by Mini APD ID32E reader ATB1525 expression reader(Biomerieux).The strain was sensitive to ceftriaxone, chloramphenicol, cotrimoxazole and ciprofloxacin. However stool culture was negative for salmonella. Investigations revealed anemia (hemoglobin 9 g/dL) with normal WBC and platelets counts. Biochemical analysis of CSF revealed cloudy fluid with 6000 WBC with 56% neutrophils, protein 160 mg% and sugar 24mg %(blood sugar 90 mg%. At 12 hours of admission she had recurrent episodes of seizures which were partially controlled with phenytoin and phenobarbitone.

Metabolic workup and coagulation profile was normal. Renal and liver function tests were normal. She had seizure followed by apnea for which she was intubated and put on mechanical ventilation. Investigation at 72 hours revealed anemia (hemoglobin 6.8g/dL) with polymorphic Leukocytosis (WBC 30,700/cu.mm) and thrombocytopenia (50,000/cu.mm). She continued to have fever with left focal seizures in spite of two anticonvulsants in full doses. In view of the persistent left focal seizure midazolam infusion was started and cranial computerised tomography (CT) was done which showed bilateral subdural effusion with effacement of sulci and gyri and watershed infarct in bilateral parietal region with bifrontal atrophy. Levetiracetam was added and seizures were brought under control. Phenytoin, phenobarbitone and levetiracetam were continued in the maintenance doses. Antibiotics and supportive treatment was continued. By Day 8, her fever had subsided and the seizure episodes had reduced in frequency and she was supported with minimal ventilatory support. She was extubated on Day 9 and antibiotics were continued for a total of 4 weeks.

At two months follow up, she was having right infantile hemiparesis with subtle seizures. EEG showed diffuse high-voltage slow waves, Computerised tomography scan of the brain showed encephalomalacia of both frontal region with dilated posterior horn of lateral ventricles more on left side with loss of architecture of sulci & gyri and thinning of corpus callosum with delayed myelination.

DISCUSSION: Salmonella strains account for 1% or less of the confirmed cases of bacterial meningitis in neonates and infants and are often associated with a high complication rate, mortality rate and a greater potential for relapse^{1,2}. Of the non typhoidal salmonella the species *typhimurium* and *enteritidis* are the commonest types in infancy^{1,2}. Berkowitz has reported *Salmonella enteritidis* among other organisms causing bacteraemia associated with gastroenteritis, pneumonia or meningitis from children with severe Protein energy malnutrition³. Cell-mediated immunity (CMI) is important in the protection against *Salmonella* infection. T-lymphocytes recognise the antigen and activate macrophages via cytokine release to enhance bactericidal killing. An effective T helper 1 cell response is necessary for the killing of intracellular *Salmonella* by macrophages. Thus, young age and conditions that suppress CMI and reduce intestinal mucosal integrity, such as human immunodeficiency virus infection and malnutrition, predisposes one to NTS invasive disease. However in our case there is no malnutrition/ immunodeficiency. Neonates and young infants are at increased risk of Salmonella bacteremia⁴. *S.enteritidis* meningitis has been reported by Workman et al from even a four week old infant but recovered without sequelae⁵. Salmonella subdural or epidural empyema occurs more commonly in children while brain abscess is more common in adults. Meningitis with subdural empyema due to non typhoidal salmonella in infancy has been reported^{6,7} and both these infants did well on treatment. The overall mortality rate has been reported to be 15% in children with extraintestinal non typhoidal infections⁸. In literature hemiparesis due to salmonella enteritidis has not been reported^{9,10}. Only one child with severe thrombocytopenia has been reported¹¹.

In order to trace the source the urine and stool culture from the close contacts were acquired and cultured. However, it was negative for *salmonella enteritidis*. Our case had both thrombocytopenia and hemiparesis. No vaccine against non typhoidal Salmonella infections is available as yet. A good understanding of the epidemiology, awareness, early

recognition and prompt treatment will help develop public health strategies to prevent NTS infections in our young children.

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