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Salmonella Paratyphi B Meningitis in an Infant; The First Report in Indonesia

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Abstract

A 7-month-old, previously healthy Indonesian baby was referred with chief complaint of several general seizures, fever and diarrhea. The baby was irritable with positive pathological reflexes. Head CT scan suggesting meningoencephalitis. CSF culture resulted Salmonella spp and biochemical test supported Salmonella paratyphi B. The baby was treated with ampicillin and chloramphenicol for two weeks. The patient was discharge without neurological complication. Salmonella paratyphi B in infant is a rare entity and it is the first case that ever reported in Indonesia. Proper management with adequate antibiotics resulted satisfactory outcome.

Keywords: Salmonella Paratyphi B, meningitis, infant

Introduction

Meningitis is described as inflammation of the membranes that encompass the brain and spinal cord[1]. Salmonella meningitis is an uncommon form and approximately 1% or less of acute bacterial meningitis in developed countries. The first case of Salmonella meningitis stated by Ghon in the year 1908 was due to Salmonella Paratyphi B[2,3].

The previous reports suggested that Salmonella meningitis was associated with a high mortality rate of up to 50-70% and high prevalence (50-90%) of morbidity presenting variable complications[4]. It is associated with significant neurological sequelae in those who survive, and a high relapse rate[4-6].

The purpose of this paper is to report a rare case of Salmonella paratyphi B meningitis infection in infant that successfully treated with conventional therapy.

Case Report

A 7-month-old, previously healthy Indonesian male baby was referred to Soetomo Hospital, Surabaya, Indonesia with chief complaint of several general

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seizures that lasted for 10-15 minutes. The baby presented with 5 days fever, diarrhea and stable hemodynamic. No history of ear discharge and thypoid fever in the family. The baby was anemic and irritable. Meningeal sign was negative, otherwise pathological reflexes were positive in both extremities.

Complete blood count showed white blood cells of 29.810 cells/mcL, haemoglobine level of 8.7 g/dl, platelet count of 405.000 cells/mcL and C-Reactive Protein was 136.65 mg/dL. Head CT Scan with contrast showed leptomeningeal and gyral enhancement on bilateral temporoparietal lobe suggested of meningoenchepalitis.

The liquor cerebrospinal analysis was cloudy in appearance, cell count was 4558/µL consisting of 53.5% polymorphonuclear cell, nonne and pandy test were positive, decreased glucose concentration (11 mg/dl) and increased total protein (97 mg/dl). Cerebrospinal fluid (CSF) culture resulted *Salmonella spp* in which sensitive with cefotaxime, ampicillin and chloramphenicol. Biochemical tests demonstrated that indole was negative and citrate was positive. Triple sugar iron produced abundant H_2S as the characteristic of Salmonella Paratyphi B. Blood culture resulted no growth of bacteria.

Based on the antibiotic sensitivity test, the patient put on ampicillin 100 mg/kg/day intravenously and chloramphenicol 50 mg/kg/day intravenously for two weeks. Phenytoin was added to control the seizures. The baby condition was improve, and then discharge in a good condition after being hospitalized for three weeks. No complication was observed. The ambulatory EEG was normal.

Discussion

The clinical signs and symptoms of bacterial meningitis in children vary depending on the age of the child and duration of disease. Classical signs of meningitis such as nuchal rigidity, bulging fontanelle, photophobia, and a positive Kernig's or Brudzinski's sign (usually in children older than 12 to 18 months) may also be present. Focal neurological signs may also be observed, as well as reduced level of consciousness. In our case, the baby was irritable, fever with positive pathological reflexes suggesting an intracranial infection.

From CSF *Salmonella spp* was isolated. Manual biochemical test showed the species was Salmonella Paratyphi B. CSF analysis through lumbar puncture (LP) is the most important laboratory diagnostic test, and routine laboratory techniques can usually identify the pathogen. In infants and young children globally, Streptococcus pneumoniae, Haemophilus influenzae type b and Neisseria meningitides are the most common causes of bacterial meningitis[7,8]. Salmonella meningitis is an unusual manifestation of salmonellosis. Humans acquire *Salmonella* by ingestion of contaminated water or food, furthermore gastroenteritis remains the most common clinical presentation. Intracranial infections follow bacteremia, which occurs as a result of migration of the organisms across the gastrointestinal tract into the bloodstream[9]. A CDC report showed that a third of patients yielding *Salmonella* isolates from the CSF were younger than 3 months, besides more than half were younger than 1 year. Many reasons, including an undeveloped blood brain barrier and a inadequately developed immune system, have been postulated for why young children are most susceptible, but no single explanation is adequate[9].

Treatment of salmonella meningitis is very difficult, and has never been standardized[5]. *Salmonella* is being a facultative intracellular micro-organism. The drug penetration is inadequate, which may result in the progression of the infection and also, there is an evidence of an increasing resistance against the conventionally used antibiotics such as ampicillin, chloramphenicol, cotrimoxazole and cephalosporins. The treatment protocol for salmonella meningitis can be adjusted depending upon the sensitivity pattern of the organism and the clinical response to the antibiotic in use. Duration of treatment varied between two to eight weeks[2-4,10] . In our case, combination of chloramphenicol and ampicillin for 14 consecutive days resulted in a good response.

The prognosis and the course of Salmonella meningitis is varies. Salmonella meningitis tends to cause a high percentage of neurological abnormalities. Coma on admission is related with a worse prognosis than a child presenting with irritability or lethargy alone[6]. In our case, the baby was fully recovered and had no obvious complication after the treatment .

Summary

Meningitis in infants is rarely caused by Salmonella paratyphi B. This is the first case that ever reported in Indonesia. The children who experienced Salmonella

meningitis may suffered from severe neurological complications, otherwise some previous reported cases showed a significant improvement. Proper management with adequate antibiotics in our case resulted satisfactory outcome.

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Conflict of Interest

The authors expressly declare there is no conflict of interest

Ethical clearance

This is a case report and inform consent was approved and taken from the parents.

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