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Case Report Open Access

Neiserria Meningitis Due to W135 Strain from South India

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Abstract

Acute bacterial meningitis due to *Neiserria* is uncommonly encountered in children. The reported mortality in invasive meningococcal meningitis is between 10- 15% with a disability rate of 11-19%. Reported cases are due to sero type A and rare reports of sero group *B. Meningococcal* disease is known to present with a stormy onset and rapid progression with mortality in children. We report two children with *Neiserria meningitis* due to the uncommon W 135 strain from Chennai, and they presented with relatively mild illness and recovered completely without any sequelae.

Keywords: *N. meningitides*; Children; W135 strain

Case Report

A 42 months male child was admitted with history of fever, vomiting and lethargy 2 days. There was no history of seizures. He was refusing food intake for 2 days. On examination child was febrile, lethargic, tachypneic, with a pulse rate of 120/mt, capillary refill time was less than 3 sec, blood pressure was 96/70 mmHg. There were no skin rashes. Pupils were equal and reacting to light, Glasgow coma scale (GCS) score was E3 V5 M6. Neurological examination revealed normal tone and reflexes, plantar was bilateral extensor with neck stiffness. Fundus was normal. Child received treatment outside for 12 hours with injection ampicillin and was referred to us for further management. In view of clinical suspicion of acute bacterial meningitis child was started on inj ceftriaxone, steroids and acyclovir with supportive therapy. Investigations revealed Haemoglobin of 12.5 g/dl, total count was 14,500 cells/cumm. C reactive protein (CRP) was elevated, renal parameters and electrolytes were within normal limits. Lumbar puncture revealed a cloudy cerebrospinal fluid (CSF). Cell count revealed 2400 cells/cumm, neutrophils was 90% and lymphocytes were 10%. Gram staining revealed plenty of pus cells. No organism could be seen. CSF protein was 56 mg/dl. CSF glucose was 32 mg/dl. Blood culture was sterile. Latex agglutination tests of the CSF was reactive for *N. Menningitidis*, culture revealed no growth. CT brain revealed hypo density in the left capsule ganglionic region. CSF was negative for Herpes simplex virus (HSV) and Japanese encephalitis (JE). Repeat CSF was cloudy with 2100 cells/cu mm. Protein was 21 mg/dl and sugar 80 mg/dl. Child received inj. ceftriaxone at a dose of 100 mg/kg/day for 14 days. Chemo prophylaxis with a single dose of oral ciprofloxacin 500 mg was administered to all the adult contacts. Meningococcal screening done at discharge was negative. CT brain revealed normal study. Child had complete neurological recovery at discharge.

23 months old female child was admitted with history of fever 7 days and generalized seizures with lethargy for 3 days. She had refusal of feeds for 3 days. There were no history similar illnesses in the family. She was febrile, drowsy, tachypneic, heart rate was 134/mt, capillary refill time was less than 2 sec, blood pressure wad 96/60 mmHg. Clinical examination revealed equal pupils and reacting to light, normal tone, brisk reflexes, plantar was bilateral extensor and neck stiffness. Anterior fontanelle was closed. Child was started on ceftriaxone and anticonvulsants with supportive therapy. Investigations revealed Haemoglobin of 8 g/dl total count of 12,300 cells/cumm. Electrolytes and renal parameters were normal. Lumbar puncture revealed clear CSF. Microscopy revealed 36 cells/cumm, 75% polymorphs and 25% lymphocytes. Gram stain revealed 14 pus cells. No organism was seen in gram stain. CSF proteins were 22 mg/dl and glucose was 60 mg/dl. Latex agglutination of the CSF was reactive for *N. Menningitidis*. CSF culture revealed *N. meningitis* sensitive to cefotaxime and chloramphenicol. PCR was positive for *N.meningitidis*. Blood culture was sterile. CSF was negative for HSV and JE. CT brain revealed a normal study. Child received intravenous Injection ceftriaxone at a dose of 100 mg/ kg/day for 10 days and was discharged after 14 days without any neurological sequelae. Meningococcal screening of the child was negative. The contacts of the child were adults and they received a single dose of Ciprofloxacin 500 mg as chemoprophylaxis.

Discussion

N. Meningitidis is a gram-negative, aerobic, non-endospore forming diplococcus. *Meningococci* can live harmlessly in the nasopharynx of up to 10% of healthy population. This 'carrier' state facilitates the circulation of the bacteria within communities with transmission taking place via airborne respiratory secretions or through direct contact. Progression from carriage to invasive disease depends on the virulence and susceptibility of the individual. Invasive meningococcal disease is rapidly fatal and the reported mortality is high. Though meningococcal meningitis is a notifiable disease the reporting has been incomplete and inconsistent. Incidence of N meningitidis is much lower as per previous Indian studies [1,2]. However recent studies from India have shown the incidence to be 9.5% [3]. However this study had only 13% of study population under 12 years of age.

Upper respiratory tract is the reservoir and habit of *N meningococci*. Transmission is through direct contact or airborne droplets and the incubation period is 1-7 days. Among the serotypes

A, B, C,Y,W 135 strains account for nearly 90% of the infections. Majority of the serogroup was A in the epidemics of meningococcal meningitis in India. There are a few case reports of C and serogroup B. Epidemics of *N. meningitis* have been reported from Delhi, Chandigarh, Mumbai, Agra, Meghalaya and Tripura. The epidemics in Delhi have shown preponderance over the end of winter and beginning of summer. There has been a shift towards older children or adults during epidemics in Delhi [4]. But for the data with regard to the outbreaks from Northern India, not much literature is existing in South India. Though sero type A is common in developing countries, there are rare reports of serotype B in India [5]. Invasive meningococcal disease due to serotypes C,Y, W135 have not been reported from India [6,7]. Globally, W135 strains are often isolated after intensive vaccination campaigns against serogroup A and C meningococci have been implemented. According to the reports published by Ramachandran et al. [8], in their study on bacterial meningitis in children, the causative organism was isolated in 89 children with meningitis. Among the positive results only two were due to *N. meningitidis*. The method used for diagnosis was isolation and latex agglutination test. However it was specified as N meningitides of groups A, C, Y or W135.

Meningococcal cases reported from Delhi, India were characterized by sudden onset of fever with petechial rash, neck stiffness, and altered sensory functions. The cases described had fever with altered sensorium and no rashes. Disease spectrum includes meningitis, meningoencephalitis, meningococcemia, pneumonia, arthritis and urethritis. Mortality is 10-15% in invasive *N. Meningitidis*. Consequences of meningococcal infection occur in about 12 of every 100 survivors and include limb amputation, skin grafting, hearing loss, seizures, kidney disease and mental retardation. However the cases described here had no shock or rashes and both of them had complete recovery without any sequelae at discharge. The clinical presentation did not make the clinician suspect *N. meningitidis* and the course of illness was uneventful in both these children. This subtle presentation possibly due to the less virulence of meningitis caused by W 135 strain in India needs to be studied further. Existing reports from Taiwan has not shown any difference in the clinical presentation of W135 strain except for increased extra meningeal involvement like pneumonia in comparison to non W135 group. Similarly presence of shock, need for intubation and the outcome did not show any statistically significant difference in their study [9].

Rifampicin, ciprofloxacin and injection ceftriaxone are used for prophylaxis among close contacts of meningococcal patients. Role of vaccination depends on the sero type prevalent and serotype covered in the vaccine. Present immunization guidelines do not recommend meningococcal vaccine as a routine in India. Vaccination is of use during epidemics only if started early. Vaccination recommendation depends on the serotype prevalent based on the epidemiological studies of the region. In USA quadrivalent vaccine had been used, while vaccination with serotype group B was used successfully in UK, and in countries like Spain and Australia vaccine against Group B was used. Though the available quadrivalent vaccine is safe and immunogenic for children from 2 years of age, the duration of this immunity, its impact on herd immunity and carrier status of these strains needs to be studied [10]. Based on the existing reports on the epidemic India it is serotype A which has been prevalent and it may be a necessity to use monovalent serotype A-meningococcal vaccine in India to be cost effective. W 135 meningococcal disease appears to be an emerging problem that should be investigated epidemiologically in India. The clinical presentation of these two cases is not typical of *N. meningitis*. It has been previously shown that N meningitis W135 strains can exist in widely divergent clonal groups. The efficacy of existing quadrivalent vaccine against W135 needs to be studied in this population. We need to have strong evidence from epidemiological data from India to plan for the necessity of vaccination and prophylaxis against *N. meningococci.*

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