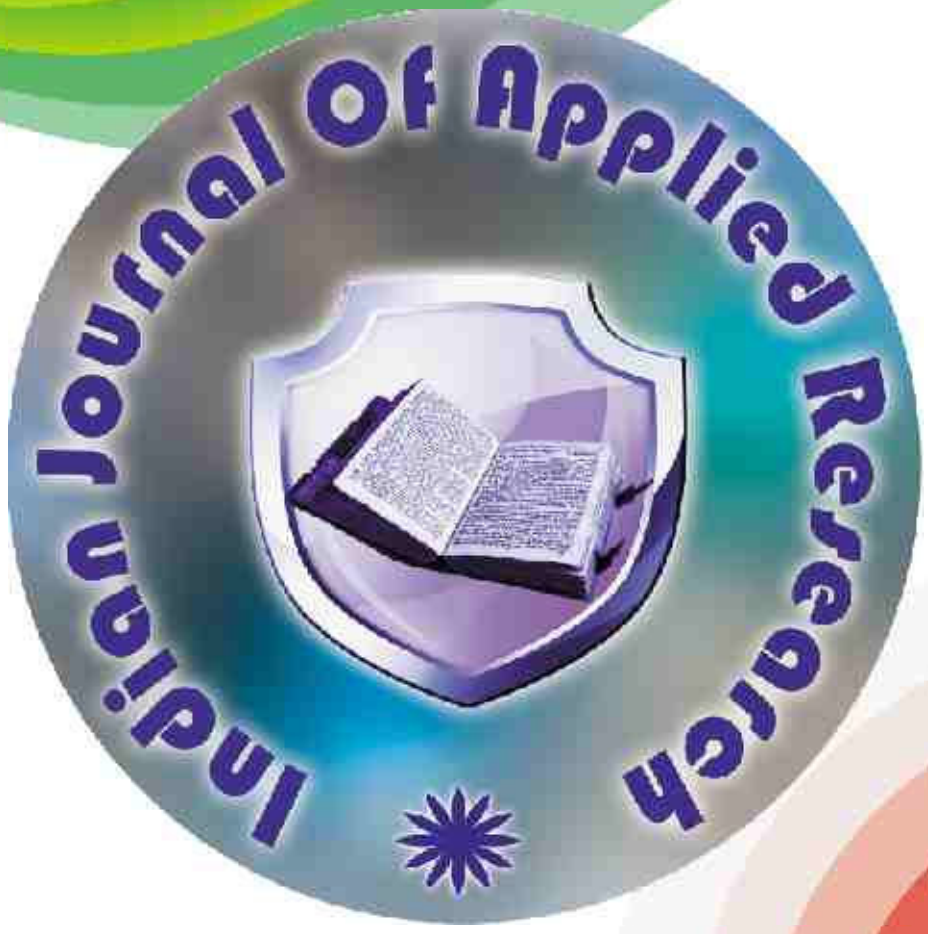
₹ 100 ISSN - 2249-555X

Volume : 1 Issue : 4 January 2012



Journal for All Subjects

www.ijar.in

Listed in International ISSN Directory, Paris.

ISSN - 2249-555X

Indian Journal of Applied Research

Journal for All Subjects

Editor,
Indian Journal Of Applied Research
8-A, Banans, Opp. SLU Girls College, New Congres Bhavan, Paldi,
Ahmedabad-380006**,** Gujarat, INDIA
Contact.: +91-9824097643 E-mail : editor@ijar.in

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Volume : 1 | Issue : 4 | January 2012 ISSN - 2249-555X

Research Paper Medical Science

A Clear CSF may not be a Normal CSF A Case Report

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ABSTRACT

Cerebrospinal fluid with a normal cell count, glucose and protein values, and a negative Gram's stain smear is usually assumed to exclude the possibility of meningitis. We report a 7 month old male infant who presented with meningitis but with normal Cerebrospinal Fluid (CSF) findings. Streptococcus pneumoniae was later cultured from CSF. We conclude that an abnormal initial CSF study might indicate a diagnosis of bacterial meningitis but a normal result does not exclude it and should not delay early institution of appropriate antimicrobial therapy.

Keywords : CSF, normal findings, Streptococcus pneumoniae

Introduction

A normal result on the initial cerebrospinal fluid (CSF) study has been traditionally used to exclude the potential diagnosis of bacterial meningitis. However, there have been a number of case studies of bacterial meningitis confirmed by CSF culture, in which an initial lumbar puncture yielded completely normal parameters. A review of the literature reports the frequency of this scenario to arise in 0.5% to 12% of cases. This might result in the delay of appropriate treatment for this potentially fatal condition.[1] We report a 7 month old male infant who presented with a clinical picture compatible with bacterial meningitis but with a normal CSF result.

Case Report

A 7 month old male infant was admitted with a history of fever of 3 days duration and tonic clonic fits 8 hours prior to admission. There was no history of prior antibiotic administration. On examination, the child was febrile, fully conscious and irritable. Systemic examination did not reveal any abnormalities. There was no neck rigidity. Kernig's sign was negative. No papilledema detected on fundal examination. There were no neurological deficits. The hematological investigations revealed a hemoglobin of 10.6 gm%, total leukocyte count was 14600/ cu. mm. (N - 37%, L - 61%, E - 2%) and platelet count was 3.8 lakhs / cu. mm. C-reactive protein was negative. Serum electrolytes were within normal limits. Blood sugar was 92 mg / dl.

CSF examinations findings were as follows. CSF cytology: cells - nil, Gram stain - no microorganisms seen, CSF biochemistry: sugar - 62 mg / dl, proteins - 12 mg / dl and globulins- not increased. Blood and CSF culture revealed Strptococcus pneumoniae sensitive to amikacin, amoxycillin-clavulanic acid, penicillin, cefotaxime and vancomycin. Broad spectrum antibiotic therapy at meningitic doses was started on admission without waiting for culture reports because of strong clinical suspicion of meningitis. The antibiotics were continued for 12 days.

Discussion

Bacterial meningitis in childhood carries a high morbidity and mortality in developing countries. Outcome depends on early diagnosis and appropriate use of antibiotics.[2] Patients of meningitis usually present with signs and symptoms of meningeal inflammation like nausea, vomiting, irritability, anorexia, headache, confusion, back pain and nuchal rigidity. Laboratory findings of CSF from meningitis cases include pleocytosis and abnormal biochemistry values. Confirmation is by demonstration of microorganisms on Gram stain or by isolation of organism by CSF culture.[3] However, sensitivity of CSF study is not 100%. There are a number of case studies of bacterial meningitis confirmed by CSF culture, in which an initial lumbar puncture especially if performed early in the course of illness (within 24-36 hr) yielded completely normal parameters. Frequency of this scenario varies from 0.5% to 12% of cases.[1] Thus a single lumbar puncture does not rule out the meningitis.[4] Onorato et al [5] and Soskolne et al [4] have emphasized the importance of repeat lumbar puncture in these patients

One of the possibilities is that lumbar puncture in the presence of a bacteremia or septicemia could be responsible for the subsequent development of meningitis, the damaged meninges becoming a nidus for circulating organisms. The production of a defect in the meninges could allow a leak of blood into the CSF, thus seeding the CSF. It has been shown experimentally that 103 organisms per ml of blood are required at the time of cisternal puncture to produce meningitis. [4]

On the other hand, from long time, it has been reported that the incidence of meningitis in children who had a lumbar puncture during the course of a pneumococcal bacteremia was no greater than in bacteremic patients who did not undergo the procedure. [4]

Leukocyte recruitment is a key aspect of the host response against invading micro-organisms. In experimental pneumococcal meningitis blocking of leukocyte accumulation in the CSF augmented bacteremia and increased mortality due to severe sepsis.

Another study in animals with pneumococcal meningitis showed a relation among a large CSF bacterial load, lack of response of CSF leukocytes and intracranial complications. This suggests that low CSF WBC is related to excessive bacterial growth.[6] This phenomenon of hypo or acellular CSF has been observed in patients with sickle cell disease who develop pneumococcal meningitis or meningitis due to Haemophillus influenzae probably because of defective inflammatory response. [7] The absence of CSF pleocytosis could be attributed to the factors like age extremity, early infection, fulminant infection, prior antibiotic therapy and immunodeficient states. [2]

However, infant in our case did not have sickle cell disease. There was no history of prior antibiotic administration. Patient was seronegative for HIV infection. The acellularity and normal biochemistry findings of CSF in this case could be due to early infective stage. We should have repeated lumbar puncture after 24 hours.

Thus a CSF with a normal cell count, glucose and protein values, and a negative Gram stain smear which usually assumed to exclude the possibility of meningitis does not rule out the meningitis. In fact, normal early CSF findings might result in delay of the appropriate treatment for this potentially fatal condition. [1, 5]

A repeat lumbar puncture should be considered in all febrile patients having clinical features suggestive of meningitis in which the initial CSF study is inconclusive. The antimicrobial therapy should be initiated, pending culture results, whenever bacterial meningitis is clinically suspected even if initial CSF findings are normal because the complications of delayed or inadequately treated meningitis are devastating.

REFERENCES

Huynh W, Lahoria R, Beran RG, Cordato D Meningococcal meningitis and a negative cerebrospinal fluid: Case report and its medicolegal implications. Emerg Med Australas. 2007 Dec; 19 (6):553-5. | 2. Gururaj AK, Pratap CR, Ariffin WA. Normal Cerebrospinal Fluid Cellularity in Childhood Pyogenic Meningitis. Sing Med J 1988; 29: 303-305. | 3. Sodhi K, Multani KS and Chandrashekhar. A Clear CSF is not Always a Normal CSF. A Case Report of Pneumococcal Meningitis. Indian Journal of Pediatrics, 2010August, 77: 899-900. | 4. Soskolne EI, Kuhn SH, Van Der Merwe PL, Keet MP. The Need to Repeat Lumbar Puncture. S A Medical Journal, 1977, March: 395-396. | 5. Onorato IM, Wormser GP, Nicholas P, 'Normal' CSF in Bacterial Meningitis. JAMA. 1980;244(13):1469-71. | 6. Weisfelt M, Van de Beek D, Spanjaard L, Reitsma JB and Jan de Gans. Attenuated cerebrospinal fluid leukocyte count and sepsis in adults with pneumococcal meningitis: a prospective cohort study. BMC Infectious Diseases 2006, 6:149 [:about 5 p.].Available from http://www.biomedcentral.com/1471-2334/6/149 | 7. Seelar RA, Metzger W, Mufson MA. Diplococcus Pneumoniae infections in children with sickle cell anemia. AM J Dis Child 1972; 123; 8-10.

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