

Case report

Concurrent tubercular and staphylococcus meningitis in a child

Amit Agrawal

Clinical and Administrative, Head Division of Neurosurgery, Datta Meghe Institute of Medical Sciences, Sawangi (Meghe), Wardha 442004 Maharashtra, India

Received January 5, 2009; Accepted March 23, 2009

Abstract

Spontaneous, non-surgical haematogenous *Staphylococcus aureus* meningitis is rare and associated with high mortality. Mixed infection causing meningitis (pyogenic and tubercular) is further rarer, poses a difficult diagnostic and management challenge, which warrants early diagnosis and aggressive therapy. We present a case of concurrent pyogenic and tubercular meningitis in a child managed successfully. It seems that in present case initial pyogenic infection resulted in the immunocompromised state for the child that would have led to the activation of tubercular foci resulting in tubercular meningitis.

Keywords: Tubercular meningitis; Bacterial meningitis; *Staphylococcus meningitis*; *Staphylococcus*; Tuberculosis

INTRODUCTION

Spontaneous, non-surgical haematogenous *Staphylococcus aureus* meningitis is rare and associated with high mortality in adults^[1-5], (relatively better outcome in children)^[5]. Mixed infection causing meningitis (pyogenic and tubercular) is further rarer, poses a difficult diagnostic and management challenge^[6-9], which warrants early diagnosis and aggressive therapy^[1-10]. We present a case of concurrent pyogenic and tubercular meningitis in a child managed successfully.

CASE REPORT

12 year male child was treated for cerebrospinal fluid (CSF) culture proven *Staphylococcus aureus* meningitis at a peripheral hospital and received appropriate antibiotics including injection Vancomycin. Al-

though his fever subsided but again he was complaining of low grade fever, headache and vomiting for last 3-4 days. The child was dull and had loss of appetite. He was admitted a diagnosis of partially treated meningitis. A lumbar puncture was performed and it showed gram positive cocci and rods on Gram's stain however the culture was sterile. The CSF leukocyte count was 222 (Polymorphs-30%, Lymphocytes-70%). He was started on antibiotics without relief in symptoms. Computerized scan (CT scan) showed mild ventriculomegaly and minimal basal enhancement suggestive of exudates (Figure 1). A repeat CSF examination did not show any cocci or bacilli (probably the previous CSF showed the contamination). The smear was negative for acid fast bacilli. Mantoux test for child was positive, X-ray chest was normal and sputum for AFB was negative. A detailed family history of the child revealed that his mother was having weight loss and cough for last 1-2 months and his maternal uncle had similar complaints about six months back and received treatment for 1 month with partial relief in symptoms. chest X-ray of the mother showed specks of calcification in the left hilar region. With these findings a diagnosis of mixed infection (tubercular as well *Staphylococcus meningitis*) was made. The child started on anti-

Correspondence to: Amit Agrawal, Clinical and Administrative, Head Division of Neurosurgery, Datta Meghe Institute of Medical Sciences, Sawangi (Meghe), Wardha 442004 Maharashtra, India
Tel: 91 - 7152 - 287701 - 9
Fax: 91 - 7152 - 287711
E-mail: dramitagrawal@gmail.com, dramit_in@yahoo.com

tubercular therapy and showed remarkable improvement in his symptoms.

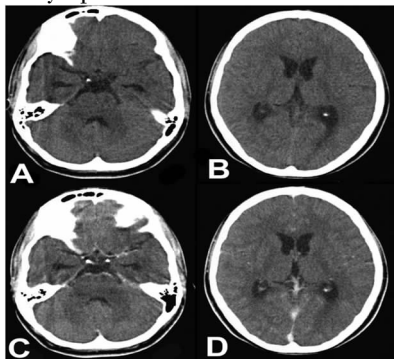


Figure 1 CT scan showing mild ventriculomegaly and minimal enhancing basal exudates

DISCUSSION

In spite of the very high mortality rates the subject of *Staphylococcus aureus* meningitis (SAM), it has received less attention with only very few investigations described in the literature^[11,12]. Although many predisposing conditions (e.g., diabetes mellitus, alcohol/drugs abuse, immunodeficiency and cancer) have been identified in adult population^[1,13], SAM in children can occur without any predisposing conditions. The simple Gram stained smear offers immediate clues to the diagnosis of pyogenic meningitis, with a sensitivity of 60% – 90% and a specificity of > 97%^[14,15]. and is an important diagnostic tests to diagnose this potentially fatal infection^[16]. The laboratory findings in SAM have not shown a specific pattern like for bacterial meningitis, but the majority of patients can have elevated CSF protein levels and leukocytes, though the CSF may be normal early in the infection^[5,14,15]. CSF samples can show a neutrophilic pleocytosis in cases of pyogenic meningitis and in the initial stages of tubercular or viral meningitis (to complicate the issue further predominance of lymphocytes is sometimes known to occur in acute bacterial meningitis), however in such cases the final diagnosis can be established after analyzing biochemical parameters and clinical details into consideration^[16]. In present case the child was treated with appropriate antibiotics with adequate doses and responded well initially. It seems that in present case initial pyogenic infection resulted in the immunocompromised state for the child that would had lead to the activation of tubercular foci resulting in tubercular meningitis. Although the laboratory investigations and imaging did not confirm the diagnosis however provided a clue to suspect the diagnosis

of tubercular meningitis. The positive history in the family further provided and evidence to support the diagnosis and response to anti-tubercular therapy confirmed the diagnosis.

REFERENCES

- 1 **Jensen AG**, Espersen F, Skinhoj P, Rosdahl VT, Frimodt-Moller N. *Staphylococcus aureus* meningitis; a review of 104 nationwide, consecutive cases. *Arch Intern Med* 1993; 153:1902-1908.
- 2 **Norgaard M**, Gudmundsdottir G, Larsen CS, Schonheyder HC. *Staphylococcus aureus* meningitis; experience with cefuroxime treatment during a 16 year period in a Danish region. *Scand J Infect Dis* 2003; 35:311-314.
- 3 **Pedersen M**, Benfield TL, Skinhoj P, Jensen AG. Haematogenous *Staphylococcus aureus* meningitis. A 10-year nationwide study of 96 consecutive cases. *BMC Infect Dis* 2006; 6:49.
- 4 **Durand ML**, Calderwood SB, Weber DJ, Miller SI, Southwick FS, Caviness VS Jr, et al. Acute bacterial meningitis in adults. A review of 493 episodes. *N Engl J Med* 1993; 328(1):21-8.
- 5 **Rodrigues MM**, Patrocínio SJ, Rodrigues MG. *Staphylococcus aureus* meningitis in children; a review of 30 community-acquired cases. *Arq Neuropsiquiatr* 2000; 58(3B): 843-51.
- 6 **Chang WN**, Lu CH, Huang CR, Chuang YC. Mixed infection in adult bacterial meningitis. *Infection* 2000; 28(1):8-12.
- 7 **Foradori M**. A case of meningitis due to *Staphylococcus aureus* complicating tuberculous meningitis, successfully treated with sigmamyacin. *Minerva Med* 1957; 48(67-68): 2707-9.
- 8 **Giusti M**, Barilli L. Casuistic and clinical study of 60 cases of meningitis superimposed on tuberculous meningitis during therapy. *Riv Clin Pediatr* 1952; 50(8):529-58.
- 9 **Swisher SN**, Meningitis due to simultaneous infection with *Mycobacterium tuberculosis* and a *Staphylococcus*; report of a case. *Minn Med* 1952; 35(5):420-3.
- 10 **Hosoglu S**, Geyik MF, Balik I, Aygen B, Erol S, Aygencel TG, et al. Predictors of outcome in patients with tuberculous meningitis. *Int J Tuberc Lung Dis* 2002; 6(1):64-70.
- 11 **Kalita J**, Misra K. Outcome of tuberculous meningitis at 6 and 12 months; a multiple regression analysis. *Int J Tuberc Lung Dis* 1993; 3:261-265.
- 12 **Misra K**, Kalita J, Srivastava M, Mandal SK. Prognosis of tuberculous meningitis; a multivariate analysis. *J Neurol Sci* 1996; 137:57-61.
- 13 **Lerche A**, Rasmussen N, Wandall JH, Bohr VA. *Staphylococcus aureus* meningitis; a review of 28 consecutive community-acquired cases. *Scand J Infect Dis* 1995; 27:569-573.
- 14 **Schlesinger LS**, Ross SC, Schaberg DR. *Staphylococcus aureus* meningitis; a broad-based epidemiologic study. *Medicine (Baltimore)* 1987; 66:148-156.
- 15 **Fong IW**, Ranalli P. *Staphylococcus aureus* meningitis. *Q J Med* 1984; 53:289-299.
- 16 **Chinchankar N**, Mane M, Bhav S, Bapat S, Bavdekar A, Pandit A, et al. Diagnosis and outcome of acute bacterial meningitis in early childhood. *Indian Pediatr* 2002; 39:914-21.