

Clinical Records

Group-A streptococcal meningitis in an adult, secondary to purulent otitis media

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Abstract

Group A streptococcal meningitis is rarely encountered today, although group A streptococcal severe infections are on the increase. We present here a case of an adult male with bacterial meningitis as a complication of otitis media induced by Group A *Streptococcus*. The approach to diagnosis and treatment considerations are discussed.

Key words: Adult; Meningitis, Bacterial; Streptococcus

Introduction

In the pre-antibiotic era meningitis caused by group A streptococci was quite common and associated mostly with otitis, sinusitis, trauma and rheumatic fever.¹ Meningitis due to this pathogen is rare nowadays – fewer than 60 cases have been described in the literature since 1966, 20 in adults.² We report here a case of an adult male with group A streptococcal meningitis.

Case report

A previously healthy 49-year-old Caucasian male was admitted to our department for non-resolving acute otitis media (AOM), acute onset of headache and vomiting. About one month prior to this admission, the patient was diagnosed as having a purulent AOM, secondary to an upper respiratory tract infection. He was treated with amoxicillin-clavulanate for a period of four days, after which the antibiotic treatment was changed to roxithromycin for another 10 days. The patient did not suffer from recurrent or chronic otitis media prior to this event.

On admission he appeared ill with a fever of 39.2°C. Otoscopy revealed a red and thickened right tympanic membrane with central bulging, and a small inferior perforation draining large amounts of purulent secretion. The left ear was normal. There was no tenderness on the mastoid, and no lymph node enlargement. On neurological examination, the patient was fully conscious, cranial nerves were intact and there was no nuchal rigidity, Kerning and Brudzinski's signs were negative. The rest of the physical examination was unremarkable.

Laboratory tests included a normal complete blood count with 8 850 leukocytes/mm³ (94 per cent neutrophils), and a normal blood-chemistry, apart from a slightly elevated creatine phosphokinase of 235 U/L. Chest X-ray was normal as was a computed tomography (CT) scan of the brain. On lumbar puncture a turbid CSF was obtained.

Its cell count revealed 1 900 leukocytes/mm³ (91 per cent polymorphonuclear) and 30 erythrocytes/mm³. The glucose concentration in the CSF was 3.7 mmol/L (50 per cent of the blood content) and the protein concentration was 1.6 g/L. A smear from the CSF showed many polymorphonuclear leukocytes without microbes. A smear from the ear revealed Gram positive cocci and polymorphonuclear leukocytes.

A presumed diagnosis of acute bacterial meningitis was made and empiric intravenous treatment with ceftriaxone and meropenem (2 g BID and 1 g 6-daily, respectively) was begun. Myringotomy, further dilating the spontaneous perforation, was performed, and the patient's condition gradually improved under this treatment. Cultures obtained on admission from the CSF and blood were sterile, while in three ear cultures, a pure growth of group-A, β -haemolytic, *Streptococcus* was demonstrated. Its minimum inhibitory concentration (MIC) to ceftriaxone was 0.008, thus meropenem was stopped 72 hours after admission. On the fifth treatment day the patient became fully asymptomatic and his tympanic membrane was intact, dry of secretions. Ceftriaxone dosage was then reduced to 2 g once daily, given for another six days, to complete a full intravenous treatment course. No neurological sequelae were observed on follow-up.

Discussion

Purulent otitis media in the adult population is uncommon, and *Streptococcus pneumoniae* is still the leading pathogen of this disease.³ Meningitis is the most common intracranial complication of otitis media with *Streptococcus pneumoniae* being the most prevalent pathogen.^{4,5} Barry *et al.*⁴ described 32 adults with meningitis secondary to AOM. *Streptococcus pneumoniae* was isolated in 22 patients (69 per cent), while *Streptococcus* species were found in two (six per cent). Bacterial meningitis in the United States is more likely to affect adults than children,

mostly due to introduction of *Haemophilus influenzae* type-B vaccine.⁶ An increase in the number of reports regarding severe group A streptococcal infection has been noticed during the last decade, some deteriorate to septic shock syndrome.⁷ There have been no reports regarding an increase in the incidence of group A streptococcal meningitis.⁸ This disease affects mainly children and adults with comorbidity such as neurosurgical procedures or endocarditis,^{2,8} although some cases were associated with otitis and pharyngitis.⁹ The neurological sequelae of group A streptococcal meningitis occur more often in children than in adults.^{2,9} The fatality rate from group A streptococcal meningitis is 12 per cent, which is better than the overall fatality rate of bacterial meningitis.^{2,6} This fact might be explained by the susceptibility of the organism to antibiotics as long as treatment is initiated on time.

Group A *Streptococcus* is a rare pathogen in acute otitis media. Its prevalence in the USA as well as in Costa-Rica, Italy and Japan was found to be three to six per cent.^{4,10-14} An unusual increase to 19 per cent was recorded in Denmark during 1989, compared to a prevalence of 10 per cent measured there during 1986-1988. The authors believed it could be explained by an epidemic.¹⁵ The distribution of the pathogens isolated in adults with AOM is similar to that of children.^{14,16} AOM caused by group A *Streptococcus* was also reported to be associated with sensorineural hearing loss.^{16,17} Hearing has improved in most cases. Steroids were added to the antibiotic treatment in some of these patients with apparently good results.

In the current case group A *Streptococcus* was isolated from pus obtained from draining the right ear but not from the CSF. Bacterial meningitis was presumed because of the toxic appearance of the patient and CSF parameters such as high polymorphonuclear count, the relatively low glucose and high protein concentrations. The sterile cultures from blood and CSF can be explained by the antibiotic treatment the patient received prior to admission. Although intravenous penicillin might be sufficient for susceptible bacteria, we chose ceftriaxone, as it covers a broader spectrum.⁹

In conclusion, when encountering an adult with purulent AOM and an ill appearance, meningitis must be ruled out. If there is evidence for meningitis, treatment should be started immediately, aimed mainly against *Streptococcus pneumoniae*, as on rare occasions group A *Streptococcus* might be the pathogen.

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