Case Report

Acute Meningitis on Account of Orbital Bone Fracture: A Case Report

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Abstract

Background: *Streptococcus pneumoniae* (*S. pneumoniae*) is a gram-positive pathogen bacteria which causes a variety of diseases, including otitis media, bacteremia, and meningitis.

Cases Report: A 19-year-old man with paroxysm was admitted to emergency department of hospital. He was diagnosed with *S. pneumoniae* meningitis on the basis of an analysis of the cerebrospinal fluid and blood culture.

Conclusion: We present a rare case of meningitis. The treatment was successful by just relying on the antibiogram test results. Vancomycin treatment was discontinued, and the patient fully recovered with Ceftriaxone.

Keywords: Bacterial meningitis, *Streptococcus pneumonia*, Orbital bone fracture

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Introduction

Bacterial meningitis remains a very important disease, with *Streptococcus pneumonia* being one of the most significant causes of this worldwide[1]. The *S. pneumoniae* gram-positive pathogen bacteria cause severe invasive disease that results in considerable illness and death, and patients who survive *S. pneumoniae*–associated meningitis often exhibit serious neurological sequelae[2]. After the bacteria enter to central nervous system, the presence of multiplying bacteria within the subarachnoid and ventricular space compartments triggers an intense inflammatory host response to kill the invading microorganisms[3]. However, despite the dramatic decrease in the incidence of bacterial meningitis, the overall case fertility rate did not change significantly[4].

Case Report

On 30 January, 2015, a 19-year-old man was admitted to the Emergency Department (ED) of Loghman Hakim Hospital, Shahid Beheshti University of Medical Sciences, because of seizure and severe disturbance of consciousness. This manifestation had appeared four months ago for first time. In relation to his past medical history, he had a head trauma six years ago. The patient just took antibiotic (amoxicillin) on account of his toothache three month ago. He had the sense of a runny nose. He does not have any diabetic history. Skin findings were normal and there was no sign of bleeding. He had no abdominal complaints. He was unconscious and just had jerky movements. On physical examination, his oral

Figure 1. (CT) scan of the face and sinuses

temperature was 38°C and blood pressure was 110/70 mmHg. His pulse and respiratory rates were 115 and 25/min, respectively. The cardiac examination was normal. No other abnormal signs were elicited. The CSF and blood samples were collected immediately after admission. A complete blood count revealed a white blood cell count of 17×10^3 /µL, hemoglobin of 15.4 g/dl, and a platelet count of 210 x 10^3/µL.

A spiral computerized tomography (CT) scan of the face and sinuses showed (Fig1) a defect in the roof of the orbit with dislocation of a part of its roof to the medial wall, along with soft tissue density in the superior part of the extraconal space of the orbit, with brain herniation, which led to displacement of the superior rectus muscle. It also showed craniotomy effects in the left orbit roof and in the indicative porencephaly, cystic area in the adjacent frontal. Hypodensity in the subcortical region of the right frontal area was seen, which was related to the previous trauma. Hence, there was no prohibition for a lumbar puncture.

A lumbar puncture was performed in the Emergency Department. His CSF was turbid and its cell count was WBC 3700/µL, PMN (polymorphonuclear) 90%, and MN (morphonuclear) 10%. The result of a fluid base on the biochemistry revealed a CSF-Sugar 5 mg/dL, CSF-Protein 130 mg/dL, and CSF-Lactate 73mg/dL, it also showed that intracranial pressure (ICP) was 14 mmH_2O.

On the basis of the findings from the physical examination and laboratory results, the patient was prediagnosed to be with bacterial meningitis, and the empirical dexamethasone, ceftriaxone, and vancomycin therapy was initiated, to last until the result of the cultures were revealed.

Table 1: Blood analysis before and after treatment.

Test	Result(before)	After
WBC	17	13.3
Hemoglobin	15.4	14
Segmented Neutrophils	91.8	94.8
Platelets	210	170
PT	12.6	
INR	1.39	

The culture of blood and CSF revealed pure growth of *S. pneumoniae*. The isolate was susceptible to vancomycin, chloramphenicol, ampicillin, trimethoprim-sulfamethoxazle, ceftriaxone, and penicillin, based on the antibiogram method. It was also resistant to clinidamycin and erythromycin.

On the basis of the culture results, vancomycin treatment was discontinued, and the patient fully recovered with 14 days of ceftriaxone therapy, without any complications during his follow-ups.

After treatment his leukocyte count dropped to 13.3×10^3 /µL, hemoglobin 15.4 g/dL, and platelets 210 x 10^3 /µL.

A lumbar puncture was repeated four days after the first lumbar puncture. His CSF was clear and colorless. The CSF cell count was 110/µL, glucose level 53 mg/dL, protein level 80 mg/dL, and lactate level 47.7 mg/dL.

The patient was immunized with the PCV-13 vaccine (Pneumococcal conjugate vaccine). We asked him to get immunized eight weeks later with PP V23 (Pneumococcal polysaccharide vaccine). After treatment, he was referred to a specialist for treatment of the bone defect.

Discussion

Bacterial meningitis is a lethal disease that requires immediate antimicrobial therapy. Despite considerable efforts to reduce the burden of the pneumococcal disease, it continues to be a major public health problem[5]. Lumbar puncture is a key diagnostic procedure and elevation of cell counts in the CSF is an important sign of bacterial meningitis. A diagnosis of bacterial meningitis is made based on clinical symptoms and analysis of the CSF. The CSF lactate level in bacterial is significantly higher than in viral

meningitis and it can provide pertinent, rapid, and reliable diagnostic information[6]. Furthermore, the CSF lactate level can also differentiate bacterial meningitis from the viral one in a quick and better manner. As it takes time for a CSF culture to confirm the diagnosis, treatment must be started immediately[7]. We have succeeded by relying just on the antibiogram test result, as we did not have access to the E-test in our hospital.

Conclusion

We can announce that based on the antibiogram test result bacterial meningitis caused by *S. pneumonia* is curable.

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