Case Report

Two Cases of Tuberculous Meningitis after Cesarean Section

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This article revealed two valuable case reports about two young females suffered tuberculous meningitis after cesarean section. After antituberculous therapy, the condition of one patient improved and the other one became deteriorated.

Key words: Cesarean section; Tuberculous meningitis; Antituberculous therapy

Tuberculosis is still an important pathological entity in developed and developing countries. Meningitis that has a predilection for the base of the brain is known to be a manifestation of tuberculosis in the central nervous system.^{1, 2} In the report, it is described two cases of young females suffered tuberculous meningitis after cesarean section.

CASE REPORT 1

A 23-year-old female with no specific family and private history complained of irregular fever and progressive disturbance of consciousness. The patient had uterine incision delivery on October 28, 2011. She had intermittent fever from November 16, 2011. The patient had received irregular antimicrobial therapy for 40 days in community clinics based upon the suspicion of a community-acquired pneumonia and purulent meningitis. For the condition had not been improved, she was transferred to the department of infectious diseases, the First Affiliated Hospital of Anhui Medical University on November 24, 2011.

When she was admitted to hospital, her body temperature was 38.5°C. Blood pressure was 90/68 mm Hg, she had a regular pulse rate of 84 beats/min and no cardiac murmurs were heard. Respiratory rhythm was even and regular, respiratory rate was 21 breaths/min. Abnormal breath sound and rales were not heard. No disorders were detected in the brain and the nervous system. Result of the blood count was abnormal (leukocyte

$14.10 \times 10^9/L$, neutrophil $11.13 \times 10^9/L$), however, biochemical examinations and electrolytes were normal. Glucose tolerance was normal: the fasting blood sugar was 5.3 $\mu\text{mol/L}$, and the HbA_{1c} level was 4.1%. All serological examinations on autoantibodies, such as RF, anti-nuclear antibody, anti-SSA/SSB antibody and PR3/MPO-ANCA were negative. Pretreatment screening for HBV serology: HBsAg positive, anti-HBe positive, anti-HBc positive, and HBV DNA was undetectable by real-time detection PCR (RTD-PCR). HIV antibodies were negative. The results of blood cultures and urine cultures were negative. Analysis of cerebrospinal fluid (CSF) showed pleocytosis ($585 \times 10^6/L$), increased total protein (1.9 g/L), decreased glucose concentrations (1.13 mmol/L), chlorides (116 mmol/L) and lactate dehydrogenase (LDH, 209 mmol/L). The adenosine deaminase (ADA) level was normal (3.8 U/L). The opening pressure was 220 mm H₂O. The results of bacterial, fungal, and mycobacterial cultures of the CSF were all negative, and the mycobacterium culture was repeatedly negative through the eighth week. By nested PCR analysis, the genome of *Mycobacterium tuberculosis* in her CSF was not detectable. The tuberculin reaction (PPD skin test) was negative. MRI of the brain was normal. High resolution CT showed no lesions in both lungs. Ultrasonography of abdomen was normal.

The patient received the antimicrobial therapy with meropenem (2.0, IV, q8h) and vancomycin (1.0, IV, q8h) from November 26, 2011. Fifteen days after the therapy, CSF analysis showed pleocytosis ($920 \times 10^6/L$), increased total protein level (1.7 g/L), decreased glucose concentrations (1.1 mmol/L), chlorides (120 mmol/L) and LDH (197 U/L). The ADA level was still normal. The opening pressure was 185 mm H₂O.

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The patient still had fever (the maximum temperature was 39.5°C). Because of poor treatment outcomes, she was given antituberculous treatment with isoniazide (0.6 g/day), rifampin (0.5 g/day), pyrazinamide (1.5 g/day) and ethambutol (0.75 g/day). Seven days after the antituberculous therapy, CSF analysis still showed pleocytosis ($721 \times 10^6/L$), increased total protein level (1.29 g/L), decreased glucose concentrations (1.1 mmol/L), chlorides (120 mmol/L) and LDH (192 U/L). The ADA level was still normal. The opening pressure was 190 mm H₂O. The maximum temperature of this patient was slightly declined. On January 11, 2012, this patient was transferred to a local hospital for further treatment due to economic reason.

CASE REPORT 2

A 22-year-old female was enrolled in hospital with the chief complaints of irregular fever and progressive disturbance of consciousness. There's no specific family and past history. The patient had uterine incision delivery on October 27, 2010. She had intermittent fever since October 29, 2010 and showed confusion on November 20, 2010. The patient had received irregular antimicrobial therapy for 20 days in community clinics based upon the suspicion of a community-acquired pneumonia and purulent meningitis. Because of coma, she was transferred to the emergency department of our hospital on November 22, 2010.

When she was admitted to hospital, her body temperature was 38.7°C, blood pressure was 110/80 mm Hg, the pulse rate was 94 beats/min and rhythm was regular, no cardiac murmurs were heard. Respiratory rhythm was even and regular, respiratory rate was 22 breaths/min, with on abnormal breath sound and rales. Disturbance of consciousness (confusion) and nuchal rigidity were observed. No disorders were detected in the brain and the nervous system. She had slight left-side muscular weakness. Muscle tension of limbs was normal. Deep tendon reflexes were normal. Pathological reflexes, left Babinski sign and Gordon sign were positive. Results of the blood count, biochemical and electrolytes examinations were normal. Glucose tolerance was normal: the fasting blood sugar was 5.1 μmol/L and the HbA_{1c} level was 4.4%. All serological examinations on autoantibodies such as RF, anti-nuclear antibody, anti-SSA/SSB antibody and PR3/MPO-ANCA were negative. Pretreatment screening

for HBV serology: HBsAg positive, anti-HBe positive, anti-HBc positive and HBV DNA was not detectable by real-time detection PCR (RTD-PCR). HIV antibodies were negative. The results of blood cultures and urine cultures were negative. Analysis of cerebrospinal fluid (CSF) showed pleocytosis ($84 \times 10^6/L$), increased total protein (3.1 g/L), decreased glucose concentrations (1.73 mmol/L), chlorides (112 mmol/L) and lactate dehydrogenase (LDH, 183 mmol/L). The adenosine deaminase (ADA) level was normal (5.3 U/L). The opening pressure was 315 mm H₂O. The bacterial, fungal and mycobacterial cultures of the CSF were all negative, and the mycobacterium culture was repeatedly negative through the eighth week. By nested PCR analysis, the genome of *Mycobacterium tuberculosis* in his CSF was not detectable. Her tuberculin reaction (PPD skin test) was negative. It was revealed in MRI of the brain that there existed lamellar-shaped abnormal slight hyperintensity signals in the right basal ganglia, enhanced signal in meninges, multiple ring-enhanced lesions in bilateral cerebellar. The high resolution CT of chest showed diffused ill-defined patches with increased density in both lungs. An electroencephalogram was performed, the result was consistent with diffuse encephalopathy. Ultrasonography of abdomen revealed normal.

The patient was considered to have cerebellar tuberculomas complicated with tuberculous meningitis and cerebral infarction. The glucose and chlorides levels were slightly decreased in the CSF, however, the protein level was significantly increased. The MRI findings were not considered contradictory to the diagnosis of tuberculous meningitis. Because of poor treatment outcomes, antituberculous treatment with isoniazide (0.6 g/day), rifampin (0.5 g/day), pyrazinamide (1.5 g/day), aminosalicylic acid (12 g/day), amikacin (0.4 g/day), moxifloxacin (0.4 g/day) and dexamethasone (10 mg/day) was used. Then during her stay in the emergency department, she developed high fever (39.7°C), excessive transpiration, decreased oxygen saturation (approximate 85%) with tachypnea (32 breaths/min). A lot of moist rales were found by lung auscultation. Seven days after the therapy, CSF analysis showed pleocytosis ($90 \times 10^6/L$), increased total protein level (3.14 g/L), decreased glucose concentrations (0.92 mmol/L), chlorides (97 mmol/L) and LDH (206 U/L). The ADA level was still normal. The opening pressure was 320 mm H₂O. Response to this therapeutic schedule was not good. On December 3, 2010, this patient was transferred to a

local hospital for further treatment.

DISCUSSION

Patients reported in this article had cerebellar tuberculomas complicated with tuberculous meningitis and cerebral infarction in the basal ganglia. The fact that *mycobacterium tuberculosis* DNA was not detectable in his CSF by nested PCR was not contradict to this diagnosis. About 20% of patients who were highly suspected to have tuberculous meningitis have been reported to be negative for the detection of the bacillary genome by nested PCR. They were initially treated based on a diagnosis of purulent meningitis. They did not respond favorably to antimicrobial agents, and was refractory to other medications. However, there was a high possibility that they had tuberculous meningitis.^{3,4,5}

Lesions in the basal ganglia accompanying tuberculomas and tuberculous meningitis were found in rare patients with vasculitis and vasculitis-associated cerebral infarct. The clinical course of the patient described in the second case suggested a contribution of demyelination, caused by an immune mechanism such as disturbance of consciousness, rather than ischemia due to vasculitis, to the occurrence of the disease. These transient signals of MRI were considered to be reflection of transient cellular edema or intramyelinic edema and caused by an immune mechanism, in which IL-6, cytokines, and

antigen-antibody reactions were involved.^{3,4,6}

The number of patients with tuberculosis is increasing recently, and cerebellar tuberculomas complicated with tuberculous meningitis and cerebral infarction in a previously healthy female is rare. It is important to give a diagnosis and treatment in time for patients with this disease, and particular attention should be paid directly to the cerebral symptoms caused by an immune mechanism.⁴ From these cases, it could be found that uterine incision delivery is probably an important factor to induce this disease.

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