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Case Report

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Successful Treatment of Nosocomial Shunt Infection Caused by Multidrug-Resistant Acinetobacter Baumannii with IV Sulperazone and Netilmicin

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Abstract

Cerebrospinal shunt applications are one of the most treatment options preferred at surgical treatment of the hydrocephalus. There are infection risks of shunts besides their affirmative contribution. Reasons of infections of shunts can be counted as age, shunt displacement, the case of the place that the shunt will be placed into, and the duration of the operation. The infections mostly occur in the first or second months after the surgery. The ventriculo-peritoneal shunt (V-P) infections are mostly originated of the skin, like Staphylococcus epidermidis. However Gram-negative bacteria as infection of cause have often isolated in recent years, and some of these bacteria have showed the multiple antibiotic resistance. Therefore, physicians have lead to research for new treatment options. In this report, successful treatment of a V-P shunt infection due to multi-drug resistant Acinetobacter baumannii without removal of the shunt and using only IV sulperazon and netilmicin is presented.

Keywords: Acinetobacter baumannii, V-P shunt infection, Meningitis, Sulperazone.

Introduction

Cerebrospinal shunt application is one of the most preferred treatment options in surgical treatment of the hydrocephalia besides their infection risks (1-3). The shunt infections are mostly originated of the skin, coagulase-negative staphylococci (like *Staphylococcus epidermidis*) and *Staphylococcus aureus* are the most encountered pathogens according to enteric rods. However, the incidence of the enteric

rods like *Escherichia coli*, and less frequently *Pseudomonas* spp. and *Acinetobacter* spp. have increased in recent years (4,5). Strains of *A. baumannii* can be resistant to most of the antibiotics including carbapenems (6). So, the new ways of treatments are needed. That's why it was thought presenting this fact of *A. baumannii* being effective would be helpful.

To the best of our knowledge, this is the first report of sulperazone therapy in combination only with IV sulperazone and netilmicin for multıdrug-resistant (MDR) A. baumannii meningitis in ventriculo-peritoneal (V-P) shunt infections. Further research is necessary to determine the role of sulperazone in the treatment of MDR A. baumannii infections in V-P shunt infections.

Case

A 45-year-old woman was admitted to Emergency Department of our hospital with complaint of fever, nausea, vomiting, and somnolence in March 2005. In her history, it was stated that she was hospitalized in Neurosurgery service because of hydrocephalus secondary to brain tumor about a month ago, and V-P shunt was implemented but 15 days after the implementation the shunt was removed with a new one when shunt dysfunction was emerged. After the replacement, it was learned that the patient's general situation went worse. She was brought to the hospital when she had qualm, puking, fever, and impairment of consciousness in addition to her initial headache. The patient was unconscious. Her fever was 38.5^{o}C and she had neck rigidity. There were no characteristics in her cranial tomography. In the laboratory; total white blood cell count, erythrocyte sedimentation rate and C-reactive protein was 22.000/mm^3, 79 mm/h and 88 mg/l, respectively. In the light of these findings, meningitis or V-P shunt infection was thought at her and lumbar puncture (LP) was performed. Cerebrospinal fluid (CSF) examination showed white blood cells of 2100/mm^3 being 95% polymorphonuclear cells and glucose of 7 mg/dl (timely serum glucose was 60 mg/dl) and protein of 65 mg/dl. It was not found bacteria at Gram stain of the CSF. Blood and CSF cultures were taken and she hospitalized to Infectious Diseases Service. For the empirical treatment was initiated vancomycin 2 g/day, since LP of result were consistent with acute bacterial meningitis and/or shunt infection. *A. baumannii* showing multiple antibiotic resistances was growth in the CSF of culture made after 72 hours. *A. baumannii* was found to be resistant to the studied other antibiotics, while one was sensitive to netilmicin, sefaperazon-sulbactam and kloramfenikol at made antibiotic susceptibility test. According to the results of culture, the patient's treatment was changed and sefaperazon-sulbactam 6 g/day and netilmicin 400 mg/day was started. The patient's opened consciousness and fallen fever on the second day of treatment. It was leaved to be make a second LP the end of treatment, since the response to treatment was good. It was made check of LP the patient after treatment with 21 days. CSF examination was evaluated as normal, and the taken CSF culture was negative, and the patient was transferred to Brain Surgery Service for shunt of revision.

Discussion

Infections of *A.baumannii* have constituted 1-3 % the infections of nosocomial. Studies showed that *A. baumannii* was responsible for 4.5% of meningitis in post-surgical patients and 10.9% in those with intraventricular catheters (7,8). The tendency of fast developing resistance to multiple antimicrobials of *Acinetobacter* genus complicates the treatment of *Acinetobacter* infections requiring the search for new agents and the return of old

drugs (9). Until the appearance of resistance, carbapenems alone or combined with amikacin were the main therapeutic options in the treatment of these infections. But, the resistance to carbapenems in the last few years has led to the use of ampicillin–sulbactam or colistin (10). Sulbactam is a beta-lactam molecule with properties similar to those of aminopenicillins but possesses only limited antimicrobial activity. It has, however, direct antimicrobial activity against *Acinetobacter*. In literature ampicillin–sulbactam was used successfully in the treatment of *A. baumannii* meningitis, and the cure rates were 67-75% (11). Colistin is a polymyxin which had been used successfully against gram negative bacteria in the past and was abandoned because of toxicity, mainly nephrotoxicity. However, it has been used in isolated clinical cases intravenously and/or intrathecally with cure rates of 93% (12). Presented case was significant to have resistant *A.baumannii* with shunt infection and to be treated successfully by intravenous sefaperazon-sulbactam and netilmicin, and to be no need for intrathecal administration and the use of colistin. There no was alone sulbactam preparation in our country when the patient were treated. Therefore, treatment of case was used the combination form. An important adjunct to treatment of postneurosurgical *Acinetobacter* meningitis in patients with ventricular shunts may be the shunt removal. In a review of treatment of shunt infections (of all types, not just those due to *Acinetobacter* spp), retention of the shunt resulted in poor cure rates regardless of the use of intravenous antibiotics (cure rate of 24%) or intravenous plus intrathecal antibiotics (cure rate 40%) (8). The greatest success was achieved with use of antibiotics combined with external drainage of the CSF; this cured more than 90% of patients (13). Drainage may be accomplished by externalization of the distal end of the shunt, or, preferably, by removal of the entire shunt with placement of a new external ventriculostomy (13). Though the proportion of treatment was low to shunt untouched, presented case was successfully treated with alone intravenous antibiotic therapy and was transferred for shunt replacement to the neurosurgery service.

As a result, the hospitalized patients and in surgical prophylaxis should be suggested that the rational of antibiotics use carefully, since in the rates Gram-negative bacteria with multi-drug resistant were seen an increase, today's and were lıved difficulties in the treatment of infections occurring by those.

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