

Original Research Article

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## Fatal Nosocomial meningoencephalitis Caused by Multidrug-Resistant *Staphylococcus* and *Acinetobacter baumannii*

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### ABSTRACT

Every day around 1,4 million patients world wide suffer from a infections, associated with hospitalization as a result of "dangerous" medical care. Neurosurgical patients have a high risk of postoperative infections of the central nervous system. Infections associated with multidrug - resistant strains have high mortality rates in patients with serious underlying diseases. We report a case of fatal nosocomial meningoencephalitis, caused by multidrug resistant *Staphylococcus lentus* – MR and pan resistance *Acinetobacter baumannii*. The patient was a woman of 61 years, operated in the neurosurgical clinic with correct diagnosis "Tumor cerebri" proved with cerebral computed tomography (CT). During a stay in Intensive Care Unit ( ICU ) of cerebrospinal fluid ( CSF ) were isolated *Staphylococcus lentus* – MR and *Acinetobacter baumannii*. The most of high risk factors for a patient is meeting with the same *Acinetobacter baumannii* strains, who was proven in the environment of the ICU. 24 days after resection of tumors patient developed clinical picture of acute meningoencephalitis and Systematic Inflammatory Response Syndrome (SIRS). Microbiologic findings includes: pan-resistance *Acinetobacter baumannii* strain from CSF and surgical granulations. In summary, we present a patient developed nosocomial meningoencephalitis, after resection of brain tumors associated with multi-resistant bacterial flora. The involvement of multiple risk factors associated with basic disease, gaps in care and inappropriate antibiotic therapy conducted, resulting in the emergence of pan - resistance *Acinetobacter baumannii* strains are responsible for the development of SIRS finished fatal.

### Keywords

Nosocomial meningoencephalitis, ICU, multidrug-resistant bacterial flora, *Acinetobacter baumannii*

### Article Info

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## Introduction

### Case Report

A 61 - year old Caucasian female R. J. hospitalized in a Neurosurgical clinic of University Hospital with speech disturbance and weakness in left limbs with limitation 1 week. Clinical examination revealed a

normal somatic status and neurological symptoms: partial motor aphasia, immobile left limbs, bilateral positive Babinski reflex. Laboratory studies revealed abnormalities: total protein – 55,8 g/l (reference ranges: 60–87 g/l ); haemoglobin count: 95 g/l

(reference ranges: 120–140 g/l); haematocrit level – 0,27 l/l (reference ranges: 0,35–0,54 l/l). Cerebral computed tomography (CT) of the brain confirmed the clinical diagnosis, Tumor cerebri, regio fronto-parieto-occipitalis dextra”. Therapy included: water-salt solutions – Sol. Glucosae 0,500 l and Ser. Physiologicum 1,0 l i.v. per daily; Mannitoli – 250 ml i.v. per daily and third-generation cephalosporins - Ceftriaxon 2,0 g i.v. daily. Eleven days after hospitalization, the patient is operated. Committed extirpation tumoris subtotalis et drainage, by ASA score IV grade (very high operative risk, according American Association of Anesthesiologists - ASA score). Three days after this was done plastica durae materis and spinal drain placed on reduction of CSF pressure. Patients are transferred to Intensive care Unit (ICU), after receiving several epileptic curl and fell into a coma. On the 3rd day of stay in ICU was conducted laboratory tests of spinal fluid from the drain. CSF analysis includes: gross appearance - xanthochromia; positive Pandi reaction, negative Rivalta reaction; biochemical changes: total protein – 2,5 g/l (reference ranges: 0,15 – 0,45 g/l); glucose – 0,13 mmol/l (reference ranges: 2,22–4,44 mmol/l); chlorides – 112 mmol/l (reference ranges: 115–132 mmol/l); cerebral fluid cells – 37 /microl leucocytes (reference ranges adults: 0 – 6 /microl); Sediment – 92 % polynuclear cells and 8 % lymphocytes. The microbiological analysis demonstrated the presence of *Staphylococcus lentus* - MR sensitive to Clindamycin, Glycopeptides and Linezolid.

In the ICU the patient was given oxygen, water-salt solutions – 2,0l a day, Mannitol – 500 ml i.v. a day., Dexamethasone – 8.0 mg., i.v. 3 times a day., Phenobarbital – 200mg 2 times a day.i.m., Diazepam – 5 mg, i.v. a day, Ceftriaxon – 1,0 g ,i.v.2 times a day. On 5 day stay in the ICU patient was a contact, afebrile, and generally in good

condition, having moved to the neurosurgical clinic. After a two-days stay, increased temperature 37.50C. Bacteriological analysis of spinal fluid proved isolation same strain *Staphylococcus lentus* - MR, in combination with *Acinetobacter baumannii* - sensitive Quinolones, Aminoglycosides, Tobramycin, Ampicillin / Sulbactam and Carbapenems. *Acinetobacter baumannii* strain has a similar sensitivity of the isolated environment in the ICU, where patient stays. A 6 - day develop clinical symptoms and laboratory evidence of acute meningitis: headache, positive Kering's signs and Brudzinski's signs, fever, CSF stagnation xanthochromic with the same constellation biochemical and bacterial findings. To antibiotic therapy Clindamycin was added 600 mg. i.v. 2 times a day. For 3 days.

At 24 days after the first operation against the likelihood of surgical site and clinical and laboratory evidence of acute meningitis and Systemic Inflammatory Response Syndrome /SIRS/ second was performed Plastica durae materis, at risk for the patient's degree in IV in ASA score. After curettage of the granulations of the surgical wound and microbiological study their isolate strain *Acinetobacter baumannii*, a new feature - resistant to all standard antimicrobial agents, incl. to Carbapenems. Antibiotic therapy was replaced with Cefoperazon / Sulbactam - 2 x 2,0 g. i.v. a day for 4 days to which is also found in vitro resistance.

40-day after surgery patient received periodic epileptic convulsions and continuous fever - 39 – 40<sup>0</sup>C. Three days later fallen into a coma - the third degree by Glasgow Coma Scale. From the surgical site to evacuate about 20 ml. pus. In a state of coma, deepening and cerebral edema and clivage came exitus letalis.

In conclusion, we present a neurosurgical patient developed acute bacterial, nosocomial meningoencephalitis, after resection of brain tumor. In clinical indications in the postoperative period patient was treated in the ICU, where it circulates multidrug resistant *Acinetobacter baumannii*. Development of acute post-operative infection of central nervous system in R. J., is result of a combination of multiple risk factors in these patients: prolonged preoperative stay - 11 days, possible staphylococcal colonization of the scalp, making several surgeries in the head, continued application of III generation cephalosporin (Ceftriaxon), in the therapeutic dose from hospitalization to 20 days after surgery, demonstrated circulation multidrugresistant *Acinetobacter baumannii* in the ICU, immunosuppressive status and malignant tumor, performed numerous diagnostic and therapeutic invasive procedures, contamination of the CSF and the surgical wound with *Staphylococcus lentus* - MR and "pan - resistant" *Acinetobacter baumannii*, crucial for rapid debilitating and fatal disease.

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