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Case Report

BACTERIAL MENINGITIS AS A COMPLICATION OF UROSEPSIS: A CASE REPORT

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ABSTRACT

Introduction Bacterial meningitis is a severe bacterial infection that infiltrates the meninges and is characterized by headache, fever and neck stiffness. We present a case of a 60-year-old female with urosepsis consulted to the neurology department with loss of consciousness. Her clinical symptoms progressed over 7 days, with loss of consciousness, fever, meningeal signs and right-sided hemiparesis, suggestive of acute meningitis. Lumbar puncture was performed and CSF analysis suggested partially treated meningitis. Blood culture revealed growth of Enterococcus faecalis. Intravenous dexamethasone and meropenem were given and oral antibiotics were continued until the patient regained consciousness completely.

Case Summary A 60-year-old female in ICU for severe sepsis following renal calculi surgery developed stupor, meningeal signs, and right hemiparesis. CSF showed pleocytosis, elevated protein, and preserved glucose, but cultures were negative. Blood culture grew Enterococcus faecalis. Cefepime was switched to meropenem and levofloxacin with renal adjustment. After 14 days of therapy, she regained full consciousness by day 10 and was discharged with a modified Rankin Scale score of 3. This case illustrates Enterococcus faecalis meningitis complicating sepsis in a postoperative ICU patient, highlighting the need for prompt recognition and tailored antimicrobial management.

Discussion Bacterial meningitis should be suspected in any severe systemic infection with clinical symptoms such as loss of consciousness. Establishing a diagnosis with the help of CSF analysis, culture, and appropriate treatment with antibiotic selection and dosage is imperative to ensure adequate penetrance to the central nervous system. Physician's clinical judgement to establish an early diagnosis and initiate treatment is crucial and determines patient outcome. Initial phase of BM can be clinically severe, and often requires treatment in the ICU initially.

Conclusion Bacterial meningitis is a life-threatening infection requiring rapid diagnosis and treatment. We report a 60-year-old female in ICU for severe sepsis after renal calculi surgery who developed stupor, meningeal signs, and hemiparesis. After 14 days of therapy, she regained consciousness and was discharged with a modified Rankin Scale score of 3. This case highlights the diagnostic challenge of meningitis in septic ICU patients and the importance of timely, tailored antimicrobial therapy.

Keywords: meningitis; complication; bacterial

INTRODUCTION

Bacterial meningitis is a severe bacterial infection that infiltrates the meninges and is characterized by headache, fever and neck

stiffness. We present a case of a 60-year-old female with urosepsis consulted to the neurology department with loss of consciousness. Her clinical symptoms progressed over 7 days, with loss of consciousness, fever, meningeal signs and right-sided hemiparesis, suggestive of acute meningitis. Lumbar puncture was performed and CSF analysis suggested partially treated meningitis. Blood culture revealed growth of Enterococcus faecalis. Intravenous dexamethasone and meropenem were given and oral antibiotics were continued until the patient regained consciousness completely.

Bacterial meningitis should be suspected in any severe systemic infection with clinical symptoms such as loss of consciousness. Establishing a diagnosis with the help of CSF analysis, culture, and appropriate treatment with antibiotic selection and dosage is imperative to ensure adequate penetrance to the central nervous system. Physician's clinical judgement to establish an early diagnosis and initiate treatment is crucial and determines patient outcome. Initial phase of BM can be clinically severe, and often requires treatment in the ICU initially.

CASE REPORT

A 60-year-old female was consulted to the neurologist in the ICU with loss of consciousness. The patient was undergoing her 7th day of treatment in the ICU for severe sepsis caused by urinary tract infection following surgery for renal calculi. She was sedated, on ventilator, and cefepime 1x2g IV was initiated. At the time of assessment, she was stuporous with positive meningeal signs, pathologic reflexes and had right-sided hemiparesis. Laboratory studies revealed elevated blood leukocyte of 10,090 cells/µL, procalcitonin 274.90 ng/mL, blood lactate 4.9 mmol/L and CRP-Quantitative 411.6 mg/L, all indicative of sepsis. Lumbar puncture was performed with cloudy CSF, pleocytosis, elevated cell count of 17 cells/µL, predominantly mononuclear cells, elevated proteins 132 mg/dL, glucose ratio of 54% ratio. Microbiology examination showed negative for Gram-stain, Indian ink stain, GenXpert, and no bacterial growth on culture. Her renal function had not improved and

antibiotic was switched with renal dose adjustment to Meropenem 2x1g IV and Levofloxacin 1x500mg IV. Blood culture prior to antibiotic administration revealed growth of gram-positive cocci identified as Enterococcus faecalis on the 4th day of culture. Antibiotics were continued for 14 days and patient's clinical condition improved and was fully conscious 10 days of administration of bacterial meningitis treatment). Patient was discharged with 3 points on the modified Rankin Scal

DISCUSSION

Bacterial meningitis (BM) is a severe infection causing significant morbidity and mortality. BM can be classified into two groups; nosocomial (including post-operative BM) and community-acquired, with *S. epidermidis* and *S. aureus* being the most common Gram-positive cocci, and *Acinetobacter baumannii, Klebsiella pneumoniae* and *Escherichia coli* are the most common Gram-negative bacteria that cause nosocomial meningitis.[1]

Bacterial meningitis is the inflammation of meninges due to bacterial invasion, where transmission through direct localized infections or highly vascularized sites, disrupt the blood-brain-barrier (BBB) and infiltrate the CNS.[2] The release of bacterial toxins and cytotoxic products stimulate host response by leukocyte influx, resulting in inflammation, edema, elevated intracranial pressure and neuronal damage.[2]

Although the typical triad of meningitis is comprised of headache (83-87%), fever (77%) and neck stiffness or meningismus (75 – 83%), impaired consciousness (69%) may also be found.[3] However, it is important to note that not all patients with BM present with all characteristic signs and symptoms. A study reported that fever (17%), headache (43.9%), neck stiffness (50.7%), decreased consciousness (58.1%), the triad of fever, headache and neck stiffness (73.6%), and the triad of fever, neck stiffness and altered mental status (86.5%) were

absent in patients with BM at admission to the hospital. [1] This poses a challenge to clinically diagnose BM, therefore clinical judgment is important and requires further diagnostic work-up to diagnose BM. Commonly associated predisposing conditions to BM such as neurosurgery-related infections (50%), previous operative treatment (45.3%) and sepsis (28.4%) may be clinical clues that allow clinicians to suspect for BM.[1]

Establishing a diagnosis promptly is imperative, and a lumbar puncture must be performed to analyze CSF fluid. CSF analysis generally shows elevated CSF cell count, mostly with polymorphonuclear predominance, decreased CSF to serum glucose ratio, normal or elevated proteins, and elevated CSF lactate levels. Additional parameters that can be measured in a CSF analysis are CSF lactate and serum procalcitonin, which are usually elevated in bacterial meningitis.[3] Leukocyte count in the CSF acts as a strong predictive tool for severity of bacterial meningitis, however cannot always be relied upon, especially if antibiotics were already administered prior to the CSF analysis.[1,4]

Empiric antibiotics is prudent and should be started immediately in BM, and choice of antibiotic should consider CNS penetrance. Group 3a cephalosporins such as Ceftriaxone 2x2g IV or Cefotaxime 4x2g IV are recommended as the initial empiric therapy. [3,5,6,7,8] Delay in the administration of antibiotics are associated with a significantly increased risk in mortality.[6,9] Corticosteroids such as dexamethasone reduce host-mediated inflammation, brain edema and intracranial hypertension.[3,4] Most guidelines recommend the administration of intravenous dexamethasone 10mg every 6 hours for 4 days, and treatment in the initial phase can significantly reduce morbidity and mortality in BM patients.[2,6,7,8]

Due to the severity of this disease in its early phase, treatment in the ICU is suggested.[3] Our case also highlights that the patient was already admitted in the ICU with

failure to regain consciousness. A study on BM in an ICU setting in the Netherlands showed that patients with bacterial meningitis patients are very much likely to suffer from severe clinical manifestations in the initial phase of the disease, where 1369 out of 2709 patients (51%) were initially admitted to the ICU, and unfavourable outcome twas more commonly associated with advanced age, cranial nerve palsies or seizures, lower leukocyte blood count, higher blood CRP, lower CSF to glucose blood ratio, persistent fever, circulatory shock and need mechanical ventilation. Out of all the patients in the ICU, 47% had unfavourable outcome and had a mortality of 22%, highlighting the importance of early identification, diagnosis and administration of antibiotics and corticosteroids to improve clinical condition and patient outcome.

CONCLUSION

Bacterial meningitis is a severe infection. Clinical features of BM oftens poses a diagnostic dilemma, therefore CSF analysis and supportive examinations are important to establish a diagnosis. Prompt and appropriate choice and dose of antibiotics and dexamethasone can significantly reduce severity, improve patient outcome, especially during the initial phases of BM, which often requires ICU treatment.

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