

CASE REPORT

A Case Report of Bacterial Meningoencephalitis with Altered Sensorium in a 50-Year-Old Male

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Abstract: Bacterial meningoencephalitis remains a significant cause of morbidity and mortality worldwide, requiring prompt diagnosis and treatment. We present a case of a 50-year-old male who presented to the emergency room with a three-day history of low-grade fever, chills, altered sensorium, and recent episodes of seizures. Upon admission, the patient demonstrated positive Kernig's sign, bilateral pinpoint pupils, incomprehensible speech, and drowsiness, with a Glasgow Coma Scale score of E3M5V2. The patient had a significant history of chronic alcohol consumption spanning 32 years. Cerebrospinal fluid analysis revealed elevated protein levels (79.7 mg/dL) and the presence of *Streptococcus pyogenes* in culture, confirming the diagnosis of bacterial meningoencephalitis. While neuroimaging studies, including MRI and CT scan, showed no significant abnormalities, other diagnostic tests helped rule out concurrent infections. The patient received empirical antibiotic therapy with intravenous ceftriaxone, along with acyclovir, vancomycin, and supportive medications. Treatment also included management of increased intracranial pressure, seizure control, and careful monitoring of neurological status. Following a comprehensive 16-day treatment regimen, the patient showed significant improvement and was discharged in stable condition. This case shows the importance of early recognition of symptoms, prompt initiation of appropriate antimicrobial therapy, and the need for a multidisciplinary approach in managing bacterial meningoencephalitis. Regular follow-up was recommended due to the risk of relapse and potential long-term complications.

Keywords: Bacterial meningoencephalitis, *Streptococcus pyogenes*, Altered sensorium, Cerebrospinal fluid analysis, Empirical antibiotic therapy.

1. Introduction

Bacterial meningoencephalitis represents a severe inflammatory condition affecting both the meninges and brain parenchyma, posing a significant global health challenge despite modern medical advances [1]. The introduction of conjugate vaccines has markedly altered the epidemiology of bacterial meningitis, though its incidence continues to rise, particularly in resource-limited settings and areas with high poverty rates [2, 3]. Recent epidemiological data suggests a concerning trend in the emergence of antibiotic-resistant strains, further complicating treatment approaches [4].

The pathophysiology involves complex interactions between bacterial virulence factors and host immune responses, leading to inflammation of both the meninges and brain tissue [5]. While various pathogens can cause meningoencephalitis, bacterial etiology demands particular attention due to its rapid progression and potentially devastating outcomes [6]. Common causative organisms include *Streptococcus pneumoniae*, *Neisseria meningitidis*, *Listeria monocytogenes*, *Streptococcus pyogenes*, and *Haemophilus influenzae*, with their prevalence varying by geographical region and patient demographics [7, 8].

Clinical manifestations typically present as a constellation of symptoms, including the classic triad of fever, headache, and neck stiffness, though these may not always be present [9]. Altered mental status, ranging from mild confusion to profound coma, often accompanies the condition and serves as a critical prognostic indicator [10]. Seizures, focal neurological deficits, and cranial nerve palsies may also develop, reflecting the extent of central nervous system involvement [11]. The Glasgow Coma Scale provides an essential tool for monitoring consciousness levels and disease progression [12].

Accurate diagnosis requires a comprehensive approach incorporating clinical findings, laboratory investigations, and neuroimaging studies [13]. Cerebrospinal fluid (CSF) analysis remains the gold standard for diagnosis, typically revealing elevated protein levels, decreased glucose concentrations, and increased white blood cell counts with predominant neutrophils [14]. However, the critical nature of the condition often necessitates the initiation of empirical treatment before obtaining definitive laboratory results [15].

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Neuroimaging studies, particularly MRI and CT scans, play a crucial role in identifying complications such as cerebral edema, hydrocephalus, or abscess formation [16]. These imaging modalities also help exclude other intracranial pathologies that might contraindicate lumbar puncture [17]. The timing of lumbar puncture relative to imaging studies remains a subject of clinical judgment, balancing the need for rapid diagnosis against the risk of herniation [18].

Management strategies must be prompt and comprehensive, involving appropriate antimicrobial therapy, control of intracranial pressure, seizure management, and supportive care [19]. The choice of empirical antibiotics should consider local resistance patterns, patient age, immune status, and potential risk factors [20]. Adjunctive treatments, including corticosteroids in specific situations, may improve outcomes by modulating the inflammatory response [21]. The prognosis of bacterial meningitis varies significantly, with mortality rates ranging from 5-25% in developed countries and potentially higher in resource-limited settings [22]. Long-term neurological sequelae can affect up to 50% of survivors, emphasizing the importance of early recognition and appropriate intervention [23]. This case report presents a comprehensive analysis of bacterial meningitis in a 50-year-old male, highlighting the crucial aspects of diagnosis, management, and the importance of a coordinated multidisciplinary approach in achieving optimal patient outcomes.

2. Case Presentation

A 50-year-old man arrived at the emergency room with primary complaints of low-grade fever and chills persisting for three days. The patient had experienced four seizures since the previous month, with the most recent episode occurring on the afternoon of admission. His condition was complicated by altered sensorium

2.1. Initial Assessment

On admission, his vital signs were:

- Temperature: 101°F
- Pulse rate: 134 beats per minute
- Blood pressure: 120/80 mmHg
- Random blood glucose: 143 mg/dL
- Oxygen saturation: 96% while receiving supplemental oxygen at 5 liters per minute
- Glasgow Coma Scale (GCS): E3M5V2

Physical examination revealed positive Kernig's sign, bilateral pinpoint pupils, incomprehensible speech, and marked drowsiness. The patient was in an altered mental state, requiring immediate medical intervention.

2.2. Medical History

The patient had a significant history of chronic alcohol consumption, consuming 200-250 mL daily since the age of 18 (spanning 32 years). No other pertinent family history was documented.

2.3. Clinical Findings and Diagnostic Assessment

Following laboratory investigations were conducted to establish the diagnosis:

2.3.1. CSF Analysis

- Protein: 79.7 mg/dL (elevated above normal range of 15-40 mg/dL)
- Glucose: 53 mg/dL
- Culture: Positive for *Streptococcus pyogenes*
- AFB staining: Negative

2.3.2. Additional Tests

- Widal test: Non-reactive
- Malaria antigen: Non-reactive
- Dengue antigen and antibody tests: Negative

2.3.3. Imaging Studies

Neuroimaging studies were performed to rule out structural abnormalities:

- MRI brain: No significant abnormalities
- CT brain: No notable brain parenchymal changes

2.4. Treatment Course

Initial management began immediately upon admission with the following regimen:

Day 1:

- Lorazepam 2 cc intravenously stat
- Phenytoin 8 ampules in 100 mL normal saline intravenously stat
- Neomol 1 gm intravenously SOS for temperature above 101°F
- Pantoprazole 40 mg intravenously once daily
- Mannitol 20% intravenously three times daily
- Metronidazole 500 mg intravenously three times daily

Day 2 (Empirical Treatment):

- Ceftriaxone 2 mg intravenously twice daily
- Acyclovir 500 mg intravenously three times daily
- Larinate 120 mg intravenously twice daily
- Phenytoin 100 mg intravenously three times daily
- Lorazepam 2 cc intravenously SOS
- Mannitol 20% intravenously three times daily
- Pantoprazole 40 mg intravenously once daily
- Paracetamol 650 mg three times daily

Following Clinical Diagnosis, the treatment was modified to include:

- Addition of Vancomycin 1 gm intravenously twice daily
- Dexamethasone 8 mg intravenously twice daily
- Acebrophylline 200 mg once daily before sleep
- Nebulization with Duolin every 8 hours
- Nebulization with Budesonide every 12 hours
- Adjustment of Paracetamol to 650 mg four times daily

2.4.1. Monitoring and Progress

Throughout the 16-day hospitalization, the patient was closely monitored for:

- Vital signs
- Neuropsychiatric symptoms
- Intracranial pressure
- Treatment response
- Potential complications.

3. Discussion

Bacterial meningoencephalitis, as demonstrated in this case, presents as a serious medical emergency requiring immediate intervention [23]. The clinical presentation with fever, seizures, and altered sensorium, along with positive Kernig's sign, aligns with typical manifestations described in literature [24]. CSF analysis remains the gold standard for diagnosis, as evidenced in our case where elevated protein levels and presence of *Streptococcus pyogenes* confirmed the diagnosis [25].

The management approach demonstrated the critical importance of empirical therapy, which is supported by current clinical guidelines [26]. Our treatment protocol involved early administration of broad-spectrum antibiotics, particularly ceftriaxone, which has shown significant efficacy in bacterial meningoencephalitis [27]. The addition of vancomycin aligns with recommendations for comprehensive coverage against potential resistant organisms [28].

The role of adjunctive dexamethasone therapy, as implemented in our case, is supported by evidence showing reduced mortality and improved neurological outcomes [29]. Management of increased intracranial pressure using mannitol and careful fluid management remains crucial, as highlighted in recent studies [30].

The patient's chronic alcoholism posed additional challenges, as alcohol abuse has been associated with increased susceptibility to central nervous system infections and poorer outcomes [31]. Despite this complication, appropriate management led to favorable results, supporting the importance of individualized treatment approaches [32]. Regular monitoring of neurological status and prompt management of complications are crucial factors in improving outcomes [33]. The positive resolution in our case, achieved over a 16-day hospital stay, reinforces the effectiveness of comprehensive care protocols in managing bacterial meningoen- cephalitis [34].

4. Conclusion

Bacterial meningoen- cephalitis requires prompt recognition and intervention for optimal outcomes. This case report demonstrates the importance of systematic diagnostic approach and comprehensive treatment strategy in managing the condition. The successful outcome was achieved through appropriate empirical therapy, followed by targeted treatment based on CSF analysis. The case emphasizes that despite the severity of bacterial meningoen- cephalitis and presence of complicating factors such as chronic alcoholism, favorable outcomes are possible with appropriate medical intervention and careful monitoring. The experience from this case contributes to the understanding of effective management strategies for bacterial meningoen- cephalitis in patients with comorbid conditions.

5. Abbreviations

AFB - Acid-Fast Bacilli; CSF - Cerebrospinal Fluid; CT - Computed Tomography; GCS - Glasgow Coma Scale; MRI - Magnetic Resonance Imaging; SOS - Si Opus Sit (if needed); mg – Milligram; dL – Deciliter; mL – Milliliter; gm – Gram; cc - Cubic Centimeter; °F – Fahrenheit; mmHg - Millimeters of Mercury

Compliance with ethical standards

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Conflict of interest statement

The authors declare that they have no competing interests or conflicts of interest related to this case report.

Statement of ethical approval

This case report did not require ethical approval as it did not involve any experimental investigations or interventions on human subjects or animals. The treatment provided followed standard clinical care protocols.

Statement of informed consent

Written informed consent was obtained from the patient for the publication of this case report. All personal identifying information has been removed to maintain patient confidentiality.

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Author's short biography

Parash Niroula

A committed PharmD student of JNTUK (Jawaharlal Nehru Technological University Kakinada) with experience as a medical laboratory technician from CTEVT, Nepal, who is passionate about healthcare and patient well-being, actively participates in clinical rotations and research with an emphasis on clinical pharmacy and pharmaceutical science. I really enjoy using my medical expertise and outstanding communication skills to support research and care plans that are maximized while upholding patient safety and ethical standards. My goals are to improve my abilities and give back to the community. Driven by a desire to positively touch patients' lives, I am looking forward to a rewarding career in clinical pharmacy and pharmaceutical science.



Avinash Kumar Shah

Dedicated to using pharmaceutical expertise to enhance healthcare, this PharmD candidate of JNTUK (Jawaharlal Nehru Technological University Kakinada) is focused on combining clinical knowledge with a patient-centered approach to provide the best possible outcomes from pharmacological therapy. Committed to innovation, lifelong learning, and leaving a lasting impression on the rapidly changing field of pharmacy practice.



Mahe Naz Shayed

Mahe Naz Shayed, a PharmD intern at JNTUK (Jawaharlal Nehru Technological University Kakinada), is dedicated to advancing the field of pharmacy through a blend of scientific knowledge and compassionate patient care. With a strong foundation in pharmaceutical sciences, I am motivated to enhance healthcare outcomes by prioritizing patient-centered approaches. As I navigate the fast-evolving landscape of pharmacy practice, my goal is to merge clinical expertise with a genuine commitment to improving patient well-being.



Bobby Samba

Bobby Samba is a prospective PharmD student who is passionate about using comprehensive pharmaceutical treatment to improve patient health. Currently pursuing a PharmD at JNTUK (Jawaharlal Nehru Technological University Kakinada), with an emphasis on patient counselling and drug therapy optimization. Eager to put theoretical understanding to use in a clinical situation. She exhibits excellent work ethics, flexibility, and a dedication to further education in the clinical pharmacy area.

