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A Case of Streptococcus Pneumoniae Meningitis

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Introduction

This is a case of streptococcus pneumoniae meningitis in an immunocompromised patient. This case discusses the presentation, management, and complications of a 57-year-old female with past medical history significant for Hodgkin's lymphoma in remission and rheumatoid arthritis on immunosuppressive therapy who presented to the emergency department with altered mental status. Streptococcus pneumoniae is the most frequent cause of bacterial meningitis in the United States. Meningitis should always be considered in the differential in a patient with fever and altered mental status. As physicians, it is vital to act early by initiating empirical antibiotics and performing a lumbar puncture to identify this disease process.

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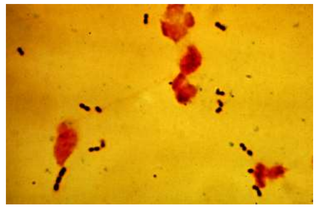
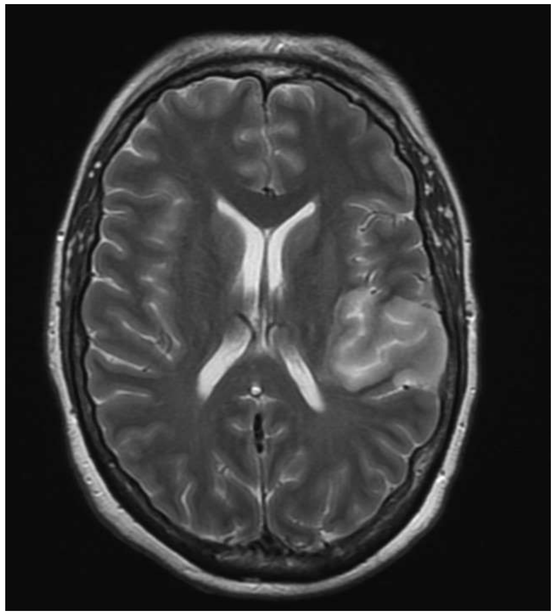
Presentation

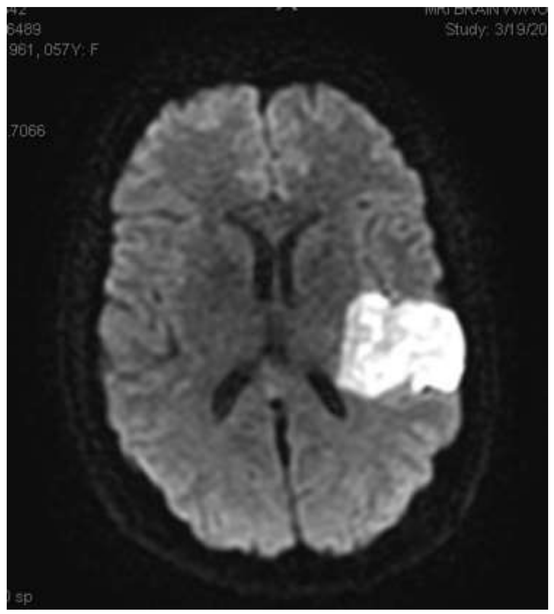
In the emergency department patient was brought in for altered mental status by sister. Sister states that the last time she spoke to patient was over 24 hours ago on the phone. The next day, she was concerned that she was not answering her phone, so she went to her house and found patient on the floor unresponsive. Patient was found barely opening her eyes and not following commands. Patient has rheumatoid arthritis and is currently on rituxin. In the ED, patient was unresponsive. Patient had a fever of 39.5 ° C, tachycardia 140s , and hypotensive at 73/40. Laboratory studies were significant for leukocytosis of 24 with a lactic acid of 4. Chest x-ray was negative for pneumonia. CT head was negative for acute intracranial abnormality. Lumbar puncture was performed and spinal fluid was positive for 879 white blood cells, protein 591, lactic acid 16.2, and glucose <10. Cerebral spinal fluid grew gram positive cocci in pairs within the hour. By the next day both blood cultures and cerebral spinal fluid grew streptococcus pneumoniae.

Management and Complications

Patient was empirically started on antibiotic coverage for possible meningitis that included vancomycin, ceftriaxone, ampicillin, and acyclovir, prior to lumbar puncture. While patient remained intubated in the intensive care unit, she was continued on vancomycin, ceftriaxone, and placed on dexamethasone for 4 days. Neurologically, Pt would open her eyes, not follow commands, but withdraw to pain with her left upper and lower extremities. EEG was indicative of moderate to severe degree of cerebral dysfunction. 2 days after presentation, patient had an MRI that showed a devastating acute infarct of left insular cortex and left parietal lobe with findings of ventriculitis. Patient was ultimately extubated day 6, but remains severely aphasic with near complete hemiparesis of her right upper and lower extremity.







Figures 1- Gram stain of CSF showing gram + diplococci Figures 2-3. MRI images of patient's left parietal CVA.

Lumbar Puncture and antimicrobial therapy

•According to Infectious Diseases Society of American guidelines, CT scan before LP should be performed in adult patients with suspected bacterial meningitis who have one or more of the following risk factors (4)

- Immunocompromised state
- History of CNS disease
- New onset seizure
- Papilledema
- Abnormal level of consciousness
- Focal neurological deficit

•If LP is delayed, blood cultures should be obtained and antimicrobial therapy should be initiated empirically .
•No absolute contraindications to performing LP

	Glucose (mg/dL)		Protein (mg/dL)		Total white blood cell count (cells/microL)		
	<10[¶]	10 to 40[Δ]	100 to 500[◇]	50 to 300[§]	>1000	100 to 1000	5 to 100
More common	Bacterial meningitis	Bacterial meningitis	Bacterial meningitis	Viral meningitis Nervous system Lyme disease (neuroborreliosis) Encephalitis Neurosyphilis TB meningitis[¥]	Bacterial meningitis	Bacterial or viral meningitis TB meningitis	Early bacterial meningitis Viral meningitis Neurosyphilis TB meningitis
Less common	TB meningitis Fungal meningitis	Neurosyphilis Some viral infections (such as mumps and LCMV)			Some cases of mumps and LCMV	Encephalitis	Encephalitis

Table 1 – Lumbar puncture findings

Age	Common bacterial pathogens	Antimicrobial therapy	Adjunctive dexamethasone
<1 month	Streptococcus agalactiae, Escherichia coli, Listeria monocytogenes	Ampicillin + cefotaxime or aminoglycoside	Early IV administration has been evaluated to diminish rate of hearing loss, other neurological complications, and mortality. Main indication is in adults with known or suspected pneumococcal meningitis . Once confirmed continue 10 mg q 6 hours for adults or .15 mg/kg q 6 for 4 days (1)
1-23 months	Streptococcus pneumoniae, Neisseria meningitidis, S. agalactiae, Haemophilus influenzae, E. coli	Vancomycin + third generation cephalosporin	
2-50 years	Streptococcus pneumoniae, Neisseria meningitidis	Vancomycin + third generation cephalosporin	
> 50 years	Streptococcus pneumoniae, Neisseria meningitidis, Listeria monocytogenes, aerobic gram (-) bacilli	Vancomycin + third generation cephalosporin + ampicillin	
Immunocompromised	Streptococcus pneumoniae, Neisseria meningitidis, Listeria monocytogenes, aerobic gram (-) bacilli (including pseudomonas)	Vancomycin + cefepime+ ampicillin OR Vancomycin + meropenem	

Table 2 – Empirical antimicrobial therapy recommendations (4)

Conclusion

This case presents an immunocompromised woman who presented to the emergency department with fever and altered mental status. Early diagnosis and treatment is most important in uspected meningitis. Unfortunately, it was discovered that this patient did not receive pneumococcal vaccine, which is indicated for immunocompromised patients. Whether or not this disease may have been prevented is unknown. Still, pneumococcus meningitis is the number one cause of bacterial meningitis in the United States, and neurological sequelae are common among those that survive.

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