Fatal Dual CNS Infection Presenting as Cardiac Arrest and Refractory Status Epilepticus in a Young Adult

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Overview

- This case highlights a rare and catastrophic presentation of coinfection with both pneumococcal meningitis and neurosyphilis manifesting as cardiac arrest and refractory status epilepticus. While each infection can independently cause seizures, their coexistence likely contributed to the rapid neurologic decline.

Introduction

- *S. pneumoniae* is the leading cause of adult bacterial meningitis, with mortality up to 30%. Seizures occur in ~25% of cases
- Seizures are a poor prognostic marker in bacterial meningitis and are associated with increased risk of long-term neurologic deficits
- Neurosyphilis, though less common today, remains clinically relevant and rarely presents with status epilepticus
- CSF VDRL remains the gold standard for neurosyphilis diagnosis
- Cardiac arrest as an initial manifestation of CNS infection is unusual but can occur due to prolonged seizures or severe systemic illness
- Pupillary hippus is defined as rapid, rhythmic oscillations of the pupil which can be the result of autonomic dysfunction, seizures, brainstem damage, and medications
- Paroxysmal sympathetic hyperactivity is a recognized complication of severe brain injury, characterized by episodic sympathetic surges presenting with tachycardia, hypertension, diaphoresis, and posturing

Case Presentation

34-year-old female with PMHX significant for T2DM and alcohol use disorder in remission who was previously asymptomatic

- CC: Found unresponsive, cardiac arrest upon EMS arrival

ROSC achieved; seizures noted en route and at ED

- Patient received lorazepam, levetiracetam, intubation
- CT head: unremarkable
- Patient transferred for higher level of care

Upon arrival: generalized tonic-clonic seizures, foamy oral secretions, hypoxia

- Treated with lorazepam, propofol, fentanyl, rocuronium

Pupillary hippus noted on exam

- Midazolam added
- Continuous EEG: 100% seizure burden; lowered to 0% following valproate administration
- Endotracheal Temperature of 40 degrees Celsius

LP preformed and Broad-spectrum antimicrobial therapy initiated

- CSF studies: RBC 366, WBC 65 (97% seg.), protein 1086, glucose 549 (serum glucose 660)

CSF grew ampicillin-sensitive S. pneumoniae; CSF VDRL reactive

- Transitioned to IV penicillin

Complications: HHS (osmolarity 338), acute hypernatremia, anoxic brain injury on MRI/CT

- Received insulin drip, IV fluids, free water flushes, and desmopressin administration

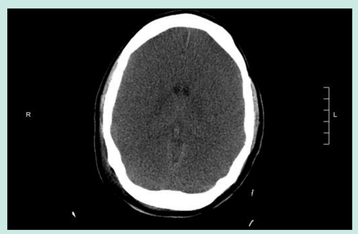
Developed paroxysmal sympathetic hyperactivity

- Treated with beta blockers, neuromodulators, and analgesia

Outcome: death after withdrawal of life-sustaining care

Figure 1: CT head – Diffuse cerebral edema, favoring anoxic brain injury (A), with cerebellar tonsillar herniation (B).

A



B

Discussion

- Dual CNS infections are rare but may worsen neurological outcomes
- Both pneumococcal meningitis and neurosyphilis can cause seizures, but coexistence presenting with cardiac arrest and refractory status epilepticus is unusual
- CSF studies may vary from traditionally expected values, especially after seizures
- Pupillary hippus, although nonspecific, may be an indicator of non-convulsive status epilepticus

Conclusion

- Consider bacterial meningitis and neurosyphilis in patients with unexplained status epilepticus and hyperthermia, especially post-cardiac arrest
- Highlights importance of early EEG, CSF analysis, and broad infectious workup including syphilis testing
- Early recognition and management may improve outcomes

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