

Listeria Monocytogenes Causing Bacterial Meningitis



Medical Science

KEYWORDS :

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ABSTRACT

Listeria monocytogenes is the third most frequent cause of bacterial meningitis. A recent case of male patient aged 33 years old from South 24-Parganas, West Bengal presented with history of fever and headache associated with neck pain and vomiting. The diagnosis was confirmed by CSF (cerebrospinal fluid) cultures positive for Listeria monocytogenes. Ampicillin is drug of choice given combined with ceftriaxone. He responded to the treatment.

Introduction :

Listeria monocytogenes meningitis occurs rather sporadically and primarily affect predisposed individuals. L. monocytogenes is also an infrequent cause of meningitis associated with high mortality rates (17% - 28%). L. monocytogenes meningitis occurs primarily in children of less than 2 months of age and in immunocompromised and elderly individuals. Listeriosis is associated with consumption of contaminated food, implicating the gastrointestinal tract as the portal of entry to blood stream.

Case Report :

A 33 years old male from South 24-Parganas, Kolkata presented with history of fever and headache since 5 days and later it is associated with neck pain and vomiting. He also complained of burning micturition. On examination, he was drowsy, conscious, neck rigidity present, photophobia present, temperature 102°F, Kernig sign - negative. Blood pressure = 130/80 mmHg, pulse rate = 88/min, GCS = 15/5 SpO₂ - 97%.

On admission to the hospital, CSF findings - WBC count (neutrophil/lymphocyte predominance) 35/Cumm and protein concentration 150 elevated, glucose level 25, CRP was 24. A computed tomography (CT) Scan of the brain showed normal study. CSF Gram stain examination was done and cultured. CSF was inoculated on to Blood agar and MacConkey agar and incubated at 37°C for 48 hours. Listeria demonstrates tumbling motility in wet mounts of CSF. CSF Grams stain results are positive showing gram positive bacilli nonsporing. Patient was treated with antimicrobial therapy following a positive CSF gram stain result. Ampicillin was the drug of choice combined with Ceftriaxone for 21 days. Therapy was with IV medications throughout. He responded well to the treatment.

Discussion :

In ruminants naturally infected with L. monocytogenes, bacteria migrate along several cranial nerves (including trigeminal nerve) to the brain stem and cause encephalitis. Similarly finding are observed in human cases of L. monocytogenes brain stem encephalitis, where inflammatory lesions may be observed in the nuclei and tracts of cranial nerves v, vii, ix, x, xii innervating the oropharynx. A wide range of microbes can invade the Central nervous system and any organism that can enter the CSF have potential to cause meningitis. Ampicillin is drug of choice, coupled with gentamicin for synergy. Cephalosporin have less activity. Vancomycin has activity but associated with higher treatment failure than Penicillin.

Recommendation / Conclusion :

L. monocytogenes may affect patients who are immunosuppressed and as well as elderly patients. Clinically it does not differ from other causes of meningitis but the initial CSF study may suggest it. Its mortality rate is similar to that of meningitis due to other etiologies.

Diagnosis of Listeriosis is best made by routine bacterial culture of specimen from sterile site - CSF or blood, serological testing for anti bodies - listeriolysin O, major virulence factor - not useful in invasive disease. Real time PCR of CSF for lyl gene which encodes listeriolysin O has been shown to be useful in diagnosis central nervous system Listeriosis.

MRI is superior to CT for demonstrating parenchymal brain involvement - brain stem. Remarkably, L. monocytogenes appears to travel intra axonally. Second, bacterial virulence factors are required for penetration of olfactory epithelium and invasion of the brain via the olfactory and trigeminal nerves. This case report has highlighted the requirement for additional research to characterize the roles of olfactory and trigeminal nerves in bacterial penetration of the brain and to determine the molecular and cellular mechanisms by which bacterial pathogen may exploit these pathways.



Image 1: Umbrella formation in soft agar

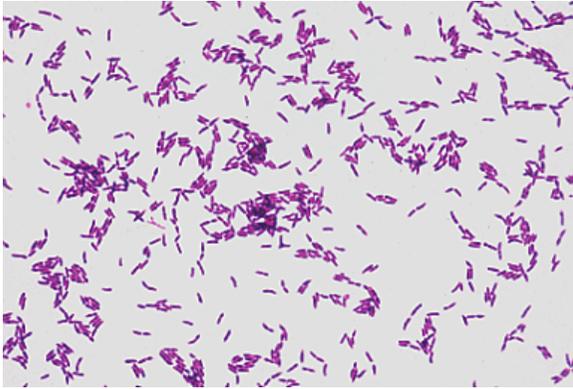


Image 2:Gram Stain from colony

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