

LISTERIA MONOCYTOGENES - A CASE REPORT

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ABSTRACT

Human Listeriosis is a zoonotic disease and usually presents as bacteremia or meningitis. Infants and immunosuppressed people are the most affected. We report a case of meningitis caused by *Listeria monocytogenes* in a 17-year-old immunocompetent

girl. The isolation of the organism from the cerebrospinal fluid (CSF) and subsequent treatment with ampicillin to which it was susceptible resulted in dramatic recovery. The case is reported for its rarity in an immunocompetent adolescent.

Key words: CSF, *Listeria*, meningitis, case report

INTRODUCTION

Listeria monocytogenes is a Gram positive, non-sporing, aerobic bacillus that is motile at room temperature and non motile at 37°C. Murray and associates first described it morphologically in 1926⁽¹⁾. Only *L.monocytogenes* and *L. ivanovii* are associated with diseases in humans. The organism may resemble *Corynebacteria*, *Streptococci* or *Pneumococci* on direct smears and hence the problem is identification and also the chance of regarding as a contaminant. Clinically *L.monocytogenes* causes meningitis and sepsis in immunocompromised individual. 25% of the cases of invasive listeriosis occur in pregnant women.

The annual incidence of listeriosis in Europe ranges from 0.1 to 11.3 cases per million. In the United States, the incidence reported in 1992 was 7.4 cases per million.⁽²⁾ In India there were no case reports on *Listeria* till 1973⁽³⁾. In 1981, a prospective study of 1300 births documented 2.2% as the prevalence rate of *Listeria* in meconium stained babies and 0.2% of live births.

Very few reports are available from India⁽¹⁾ especially in immunocompetent individuals and hence the present case is reported.

CASE REPORT

The CSF of a 17-year-old, unmarried girl who presented with signs and symptoms of meningitis was sent for biochemical, pathological and microbiological analysis. There was no history of steroid intake. Macroscopically CSF was turbid and the WBC count was 1250 cells/cubic millimeter. CSF protein was raised (182mg/dl) and sugar was low (15mg/dl). CT scan of brain was normal.

Gram staining of the CSF showed mononuclear cells with moderate Gram-positive, short, nonsporing bacilli with diptheroid like arrangement (Fig. 1). The CSF was inoculated onto Blood Agar (BA), Chocolate Agar (CA), and Mac conkey Agar (MAC). After 24 hours of incubation, the BA plate showed moderate growth of small, round, smooth, translucent colonies with minimal beta hemolysis. CA also showed moderate growth of tiny colonies. No growth was seen on MAC. Two blood cultures were done and were reported negative after 14 days of incubation. CSF culture for tuberculosis and smear for acid-fast bacilli were negative.

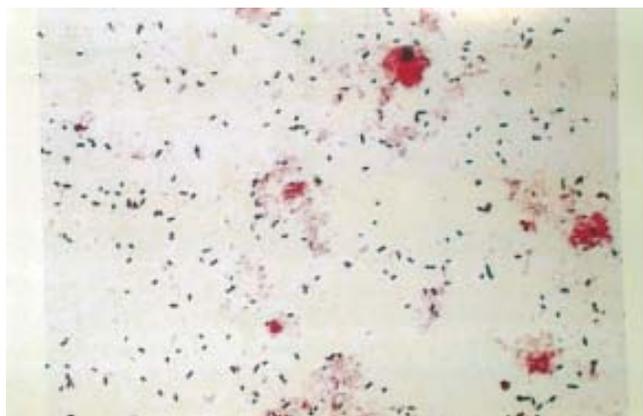


Fig. 1 Gram Staining of CSF

Gram staining of the colonies also showed Gram-positive, short, nonsporing bacilli with diptheroid like arrangement (Fig. 2). Tumbling motility was demonstrated in nutrient broth incubated at 25° C and the organism was non motile in nutrient broth incubated at 37° C. It was catalase, esculin and hippurate hydrolysis positive. Umbrella shaped motility pattern was observed in semisolid nutrient butt. CAMP test (Christie, Atkins and Munch-Peterson) using plazen strain of *Staphylococcus aureus* was positive. The isolate was identified as *Listeria monocytogenes* based on Gram stain, tumbling motility at 25°C, catalase positive and ability to grow at 4°C. The isolate was sensitive to penicillin, ampicillin, gentamicin, cefotaxime, and ciprofloxacin and resistant to cotrimoxazole.

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Fig. 2 - Gram Staining - Culture Smear

The patient had been empirically treated with cefotaxime and antituberculous drugs (rifampicin, pyrazinamide, etambutol) but was not responding. However after the culture and sensitivity report, she was switched over to intravenous ampicillin which was continued for ten days. There was dramatic improvement clinically within 24 hours and after a week all parameters returned to normal. There was no neurological deficit at the time of discharge and the patient was advised to continue oral ampicillin for two more weeks.

DISCUSSION

Listeria monocytogenes usually presents as bacteremia or meningitis. It is mostly common in neonates but children and adults may also be affected. The predisposing factors are pregnancy, diabetes mellitus, malignancy, collagen disorders and immuno-suppressed patients. The incubation period of listeriosis averages about 3-4 weeks with a range of 3-90 days⁽²⁾. In cases of early onset neonatal listeriosis, the infant is infected in utero presumably by transplacental infection from mother who is bacteremic.

Though listeriosis is common in neonates, children more than one year and adults may also be affected and about one third of the patients with meningitis have no predisposing conditions and occur even in healthy children and adults⁽⁵⁾. In this case it was isolated from a 17-year-old immunocompetent girl.

Regarding the treatment of listeria meningitis combination therapy of ampicillin (dose 25- 100mg/kg body weight) and gentamicin (dose 3-5 mg/kg body weight) is

recommended for 21 days. It is always resistant to cephalosporins, which are used in the empirical treatment of bacterial meningitis of unknown etiology. In this case though there was in vitro susceptibility to cefotaxime, the patient responded well only after switching over to ampicillin.

Due to its morphological resemblance with diphtheroid species, *L.monocytogenes* could be regarded as a contaminant in the laboratory. It is difficult to isolate this organism from certain clinical specimens particularly from tissues removed at surgery or at autopsy.

The important points for identification of *L.monocytogenes* in laboratory diagnosis are listed in Table I⁽²⁾

Table - I – Key Points for Identification of *L.monocytogenes*

- Narrow zone of beta hemolysis around the colonies on blood agar.
- Growth at 4° C
- Tumbling motility at 25° C and non motile at 37° C
- Catalase positive
- Hydrolysis of esculin
- Fermentation of glucose, trehalose and salicin
- CAMP test positive
- Negative reaction for hydrogen sulphide

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