Navigating listeriosis: a case report highlighting swift diagnosis and management in a high-risk patient

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Abstract

Listeriosis is a serious foodborne bacterial infection with potentially severe consequences, particularly for pregnant women. A 38-year-old primigravida presented with fever and malaise during her third trimester of pregnancy and a diagnosis of listeriosis was confirmed through blood culture. An emergency caesarean section was performed, and a healthy baby was delivered. The patient had consumed a significant number of dairy products before the onset of fever, highlighting the importance of dietary history. This case report emphasises the need for healthcare providers to maintain a high index of suspicion, especially in high-risk patients. This also shows that swift diagnosis and empirically targeted management are essential in combatting listeriosis in pregnancy, and lead to better maternal and foetal outcomes. It also underscores the necessity of raising awareness among pregnant women about safe dietary practices to reduce the risk of listeria infection.

Keywords: Listeria monocytogenes, Listeriosis, Pregnancy, Outcomes.

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Introduction

Listeriosis is caused by an intracellular aerobic and facultative anaerobic gram-positive bacterium, Listeria Monocytogenes. This illness can be very serious for pregnant women, the elderly, and immunocompromised people. Pregnant women, particularly, have an 18 times greater risk of developing a Listeria Monocytogenes infection.[1] During pregnancy, infections are more likely to occur in the third trimester.[2] It is often transmitted via contaminated ready-to-eat food, vegetables, meat and milk products such as cheese and yoghurt.[3]

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Listeriosis has two main forms: non-invasive, a mild form causing febrile gastroenteritis in healthy individuals; and invasive, a severe form affecting pregnant women, immunocompromised patients, the elderly, and infants. It has a vertical mode of transmission to the foetus.[4] Fever is the most common clinical finding in 65-81% of the cases of maternal listeriosis.[1] Presented herein is an interesting case of invasive listeriosis that struck a primigravida in the third trimester of pregnancy.

Case Report

A 38-year-old primigravida presented to the emergency department of Aga Khan Secondary Care Hospital on April 26, 2022, at 36 weeks gestation with a chief complaint of fever, malaise, and shivering persisting for the past four days. She reported an increased urinary frequency and curdy vaginal discharge. The patient's medical history included a diagnosis of type 2 diabetes mellitus and polymyositis since 2017. Notably, she had a history of necrotising myositis of the femur neck, for which she had undergone bilateral femoral head core decompression and vascularised fibular graft surgery under general anaesthesia in 2019.

Upon admission on April 28, 2022, the patient was conscious but lethargic. Her vital signs were as follows: blood pressure 117/76 mm Hg, pulse rate 117/min, temperature 39°C, oxygen saturation 98% on room air, and respiratory rate 20/min. General physical examination and central nervous system examination were unremarkable, with a Glasgow Coma Scale score of 15/15 and no signs of seizures or headaches.[5] On abdominal examination, the height of the fundus corresponded to the expected gestational age, and the presentation was cephalic. Cardiotocography (CTG) showed a reactive pattern.

During a per speculum examination, the cervix was noted to be closed, and a small amount of milky discharge was observed. A high vaginal swab (HVS) was collected for culture and sensitivity. Laboratory investigations included a complete blood count (CBC), malaria and dengue antigen and antibody tests, electrolyte levels, liver function tests (LFTs), urine culture, blood culture, and HVS

culture. The patient was started on intravenous Ceftriaxone, intravenous hydration, and paracetamol. She was already receiving insulin and metformin for diabetes, which effectively controlled her blood glucose levels.

On the first day of admission, the CBC revealed a haemoglobin level of 11.8 g/dL (normal: 12–16 g/dL), a total leukocyte count of 7.5 × 10^9/L (normal: 4–11 × 10^9/L) with 83% (normal: 40–75%) neutrophils, and a platelet count of 128 × 10^9/L (normal: 150–450 × 10^9/L). C-reactive protein (CRP) was elevated at 138 mg/L (normal: <10 mg/L), and erythrocyte sedimentation rate (ESR) was 50 mm/hour (normal: 0–20 mm/hr). Tests for dengue, malaria, and COVID-19 were negative. LFTs were within normal limits, and urine culture showed no growth. Despite receiving intravenous antibiotics, the patient continued to have a fever of 39°C. Given this persistent fever, the infectious diseases and microbiology teams were consulted.

On the second day of admission, the fever persisted, and the CBC showed a decrease in haemoglobin to 10.8 g/dL (normal: 12–16 g/dL), an increase in the total leukocyte count to 8.3 × 10^9/L (normal: 4–11 × 10^9/L) with 83.8% (normal: 40–75%) neutrophils, and a decline in platelet count to 89 × 10^9/L (normal: 150–450 × 10^9/L).

On the third day of admission, the patient remained tachycardic and febrile, with platelet count dropping to 87 × 10^9/L (normal: 150–450 × 10^9/L). An echocardiogram, a foetal growth, and Doppler scan showed no abnormalities. Due to the declining platelet count, the patient received a transfusion of four units of platelets. A call from the laboratory reported heavy growth of gram-positive bacilli on gram stain from her blood culture, suggesting listeriosis. Intravenous Ampicillin and Gentamicin were initiated.

On the fourth day of admission, the patient remained febrile despite 24 hours of intravenous antibiotics.

On the fifth day of admission, the patient complained of vaginal leakage. A per speculum examination revealed a closed cervix, positive nitrazine test, and grade I meconium drainage. An emergency lower segment caesarean section was performed due to non-reassuring CTG findings. An alive baby girl was delivered with Apgar scores of 8 and 9 at 1 and 5 minutes, respectively. The placenta was sent for culture and sensitivity. Concurrently, the preliminary blood culture report revealed Listeria growth, confirming the diagnosis. However, the placental cultures showed no growth of micro-organisms. The patient continued to receive intravenous Ampicillin and Gentamicin.

Upon inquiring about her dietary habits, the patient reported consuming a substantial number of dairy products, particularly milk and yogurt, due to disturbed bowel movements one week prior to the onset of fever. Post-operatively, she remained stable and afebrile and was discharged after 48 hours on Ampicillin and Gentamicin for a 14-day course.

At the follow-up visit on the seventh post-operative day, the patient remained afebrile, her surgical wound showed healthy healing, and all laboratory parameters, including CBC, LFTs, and electrolytes, were within normal limits. Placental culture was negative. Both the mother and baby were in good health and the mother was counselled on breastfeeding and contraception.

Discussion

Listeriosis in pregnancy is a potentially life-threatening infection and its timely diagnosis and management is of paramount significance.[1] It can lead to severe maternal and foetal complications including neonatal meningitis, chorioamnionitis, miscarriage, or symptoms of threatened preterm birth, such as abdominal pain or vaginal bleeding.[6] According to the MONALISA study, 24% of the women with pregnancy-related listeriosis experienced foetal loss.[7] A definitive diagnosis can be made by blood culture, amniotic fluid, cervical/vaginal swab or placental culture, the most reliable being blood and placental cultures as demonstrated in this case.[4]

The seasonal distribution of listeriosis infection is also significant. A study on the epidemiology of listeriosis in China reported a peak frequency between March and May, which aligns with the present case.[8] Generally, two to three weeks of treatment is sufficient for various serotypes of Listeria. Treatment of Listeria in pregnancy or after delivery with high-dose intravenous Amoxicillin (more than 6 g/day) shows exceptional improvement. In cases of allergy to Amoxicillin, Erythromycin is suitable as it does not harm the foetus and is also safe during breastfeeding.[1] Similarly, this patient was given injection Ampicillin 1,500 mg Q6h along with injection Gentamycin 240mg QD post-operatively to which she responded well. Listeria is known to be resistant to some common antibiotics,[9] and prompt initiation of appropriate antibiotics is essential for achieving a favourable outcome. The need for a transfusion of platelets due to declining platelet count emphasises the systemic impact of Listeria infection, which may lead to haematological abnormalities and sepsis.[10]

This case report also highlights the role of dietary history in diagnosing Listeria infection. The consumption of dairy products before the onset of fever, indicates the milk

products as a likely source of the infection. A study conducted in Hyderabad showed that 9% of milk samples that they tested were positive for the presence of Listeria Monocytogenes.[3] However, the long incubation period of 7-67 days makes it challenging to link consumption of contaminated food with Listeria infection.[1]

Swift diagnosis and empirically targetted management are the most crucial and effective ways to combat Listeria Monocytogenes. Obstetricians must keep listeriosis in the differentials when a gravid patient exhibits unexplained fever. Dietary history must always be obtained, and awareness must be spread among pregnant women regarding dairy products and ready-to-eat foods so that chances of encountering the infection can be minimised.

Conclusion

This case underscores the importance of maintaining a high index of suspicion for listeriosis in pregnant patients presenting with unexplained fever. The rapid initiation of empirically targetted antibiotics led to a successful maternal and neonatal outcome. Additionally, the patient's dietary history provided a vital clue for the diagnosis, emphasizing the role of comprehensive clinical assessment in such cases.

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