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Case Report

Streptococcus gallolyticus subspecies *pasteurianus* causing late onset neonatal sepsis and meningitis: a case report

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ABSTRACT

S. gallolyticus is a gram-positive microbe rarely isolated from cases of neonatal sepsis. Prompt identification, management and monitoring is necessary in such cases due to potential complications like meningitis and endocarditis. We report a preterm baby referred to us on day 18 of life with fever, respiratory distress and lethargy with seizure. Blood culture revealed *S. gallolyticus* subspecies *pasteurianus* with meningitis on cerebrospinal fluid examination. He was treated with 21 days of injectable vancomycin and teicoplanin. Baby had no neurological sequelae or other end organ complications. To the best of our knowledge, this is the first case report from eastern India describing sepsis secondary to this rare organism.

Keywords: Gram positive, Meningitis, Neonatal sepsis, *S. gallolyticus*

INTRODUCTION

S. gallolyticus is a gram-positive organism of Lancefield group D, earlier known as *S. bovis*.[1,2] In adults, its role in gastrointestinal, hepatobiliary infection and endocarditis is well known and it also has an association with colonic cancer.[3,4] Among neonates, sepsis secondary to this organism is rare can lead to complications like meningitis, endocarditis and liver abscess.[5,6] However the mechanism by which this organism reaches the blood stream and its tendency to cause meningitis; are not well known, as neonatal infection can occur both in colonised and uncolonized mothers.[7] Routine screening of mothers for bacterial colonisation is not performed and blood culture is often not done routinely in many places in India. Even when performed, unavailability of genomic sequencing to classify subspecies of bacteria, could miss such unusual causes of bacterial sepsis. We report a case of a neonate with *S. gallolyticus* ssp. *pateurianus* sepsis and meningitis. As per our knowledge (based on Medline, PubMed, CINAHL and Web of Science search), no such case has been reported previously from India.

CASE REPORT

A preterm male baby was born to a 32-year-old primiparous mother at 34+1 weeks of gestation by emergency caesarean section in view of leaking per vaginum and oligohydramnios. Mother had gestational diabetes and was receiving insulin and metformin. In the second trimester, she developed an episode of urinary tract infection which was successfully treated by intravenous (IV) antibiotics. High vaginal swab was not taken prior to birth and there was no history of antibiotic administration for vaginal leakage. Baby had respiratory distress at birth and was admitted in a private nursing home for 6 days where he received oxygen, intravenous fluid, and antibiotics, however, the full details of treatment and investigations were unavailable. After discharge, baby stayed at home where formula feed was

given by bottle. On day 18 of life, he presented to our hospital with 3 days history of cough, 1 day history of fever, respiratory distress, poor feeding, lethargy and single episode of generalised tonic seizure. On examination, temperature was 101-degree Fahrenheit, respiratory rate 58/minute, heart rate 213/minute. Baby had tonic posturing and inconsolable cry. Respiratory system examination showed grunting, chest retraction and nasal flaring. Abdominal examination was normal. Point of care blood glucose was normal. Initial investigation showed leucopoenia and neutropenia (TLC 3200 per cubic millimeter, ANC 1210 per cubic millimeter), C-reactive protein (CRP) 12.10 milligrams/liter with normal platelets. Blood gas showed mild metabolic acidosis, normal electrolytes, and normal lactate. He was started on humidified high flow nasal cannula oxygen, intravenous fluids, antibiotics (injection meropenem, amikacin) and injection levetiracetam at 60 milligrams per kilogram per day. He stabilised on second day of admission and was started on tube feeds. After 48 hours of admission, an episode of self-limited generalized tonic clonic seizure was noted. The dose of levetiracetam was increased to 80 milligrams per kilogram per day and a repeat CRP and CSF examination were done. The CRP value was 153mg/l and CSF revealed a cell count of 496 (lymphocytes 81%, neutrophils 19%), protein >300 mg/l, sugar 30 mg/dl establishing the diagnosis of meningitis. However, CSF was negative on gram staining and culture. The admission blood culture result was positive for *S. gallolyticus* subsp. *pateurianus*. The culture was done using Automated BacT/ALERT and Vitek system was used for bacterial identification (bioMérieux, France) but sensitivity assay could not be reported due to technical issues in the machine. Antibiotics were changed to injection teicoplanin and injection vancomycin in view of gram-positive nature of this organism after reviewing available neonatal reports citing the same organism. He showed good clinical progress and within a week was fully weaned from oxygen and started on full oral feeding. There was no recurrence of seizure. Serial CRP was done which normalised 9 days after the admission. Injections teicoplanin and vancomycin were given for a total of 21 days to treat meningitis. The total duration of hospital stay was 27 days and at the time of discharge neurological examination was normal. Otoacoustic emission test was pass in both ears. He is on regular follow up in our neonatal follow up outdoor patient clinic.

DISCUSSION

This is the first case report of *S. gallolyticus pasteurianus* associated neonatal sepsis and meningitis from eastern India to the best of our knowledge. It is possible that such cases had been missed in past due to unavailability of advance blood culture technique. The presentation and clinical course were similar to other case reports in the past.[1] The source of infection in our baby was not known. Maternal history was inconclusive regarding congenital source of infection. The baby was admitted in another hospital for 6 days after birth where he received iv antibiotics, thereafter, staying at home for 12 days. Infection from community sources is possible as in the past late onset sepsis have been reported after an initial stable period.[8-10] In their report from Korea, Park et al admitted a 28-day old infant with short history of fever and no known perinatal complications. The investigations showed positive blood and CSF cultures for *S. gallolyticus* ssp *pasteurianus*. After completion of intravenous antibiotics this baby was discharged to home but 2 weeks later presented again with bilateral subdural effusion in frontal region. This case highlights the importance of close neurological follow-up in such cases.[8] Neurological examination at discharge was normal in the index case. In another case report by Takahashi et al from Japan, a 5-week-old term infant with normal perinatal condition was identified to have meningitis caused by this organism when he presented with short history of fever, irritability and decreased oral intake. The culture of blood, CSF and stool were positive for *S. gallolyticus ssp. pasteurianus*.[9] While the source of bacteria is usually maternal birth canal in early onset sepsis, for cases of meningitis presenting later in the disease course, the possible source could be intestinal tract as reported in a study by Nobel et al.[11] In a recent systemic review by Iliodromiti et al where a total 66 cases were included; the day of onset of symptom was mentioned in 47 cases and out of this 60% presented as late onset sepsis. Among the 18 cases where maternal vaginal or perineal culture was taken, none reported presence of Group D Streptococcus. The common presenting symptoms in this review were respiratory distress, fever, poor feeding, lethargy, and seizure. Meningitis was most common complication reported (75% of the reported cases of complications).[1]

CONCLUSION

In summary, our case report highlights a case of rare pathogen causing sepsis and meningitis in newborns. It also emphasizes the need for appropriate bacterial identification system for identifying cases of such organisms. Certain limitations like lack of complete bacteriological surveillance in both mother and baby prohibited us from any conclusion about the source of infection in the index case. In cases with neurological symptoms or abnormal neurological examination, neuroimaging should be considered in cases of *S. gallolyticus* ssp *pasteurianus* sepsis as this organism is associated with a significant burden of meningitis. Absence of sensitivity report due to technical reasons although prevented us from knowing the appropriate antibiotics in a setting of very high bacterial resistance. Fortunately, the baby responded to empirical selection of vancomycin and teicoplanin and the clinical course remained uncomplicated.

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