

Salmonella Sepsis presenting as Early Onset Neonatal Sepsis

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Abstract

Neonatal sepsis is one of the feared cause of neonatal death in both term and preterm infants, leading up to 30% of neonatal death in developing countries. Salmonella sepsis is one of the uncommon causes of early onset neonatal sepsis. Here we present a case of early onset neonatal sepsis due to Salmonella species. Baby was delivered vaginally with good Apgar score. Within few hours of birth, baby developed respiratory distress and was admitted with empirical antibiotics. The blood culture showed the growth of Salmonella species. Child was treated with IV antibiotics and responded well to it and was discharged home without complication.

Key words: Neonatal Sepsis, Salmonella, Blood Culture

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Introduction

Neonatal sepsis is one of the leading cause of neonatal death in both term and preterm infants¹, leading up to 30% of neonatal death in developing countries². The signs and symptoms of neonatal sepsis are subtle and nonspecific. There can be fever or hypothermia, respiratory distress, poor feeding, poor perfusion, decreased activity, seizure etc. Most importantly, they just don't look right^{3,4}. Neonatal sepsis is classified as Early-onset neonatal sepsis (EoNNS, sepsis within first week of life) and Late-onset (LoNNS, sepsis after first week of life)⁵. Organisms causing early-onset neonatal sepsis are typically colonizers of the maternal genitourinary tract, leading to infection of the amniotic fluid, placenta, cervix, or vaginal canal. The pathogen may ascend through ruptured amniotic membrane, prior to the onset of labour, causing an intra-amniotic infection⁶. Almost 70% of the cases of early-onset neonatal sepsis are cause by *Group B Streptococcus* (GBS) and *Escherichia coli*⁷. Other pathogens includes Viridans group Streptococci, *Staphylococcus aureus*, *Enterobacter spp*, *Listeria monocytogenes*, *Klebsiella pneumonia*, Haemophilus influenza etc⁷. Salmonella is usually not considered as causative organism of Neonatal sepsis, as its incidence is not very common but there are reports of vertical transmission of Salmonella from mother to foetus and horizontal transmission through faecal contamination of lower birth canal or aspiration or ingestion of contaminated food as top feed or reports of oral suction in nursery leading to Salmonella sepsis^{8,9}.

How to cite

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Table 1: Showing investigation reports of the baby

Test	Value	Test	Value
Total Leukocyte Count	26,900/cmm,	Urea	29mg/dL
Differential Leukocyte Count	Neutrophils 81%, Lymphocytes 18%, Eosinophil 1%,	Creatinine	0.9mg/dL
Platelets	158000/cmm	Sodium (Na)	147mEq/L
Haemoglobin	16.6gm%	Potassium (K)	4.8mEq/L
CRP	< 6 mg/L	Random Blood Sugar	72mg/dL
Blood Group	B positive.	CSF Sugar	47mg.dL
CSF Cells	Nil	CSF Protein	125mg/dL
CSF Culture	Sterile	CSF Gram & AFB Stain	Nil Organisms
Blood Culture	Salmonella spp		

The Case

A term, male child, born to a 27 year old multigravida mother, with Apgar Score of 7/10 and 9/10 at 1 and 5 minute of birth respectively. His birth weight was 3.4 kg, Vitals and systemic examination were normal at the time of birth. His mother had regular antenatal check-up in hospital and had uneventful pregnancy without complication. She didn't experience episodes of fever, diarrhoea or vomiting during pregnancy. Her antenatal ultrasounds were normal, except for the last one which reported Oligohydramnios (AFI 8.1cm), for which she was admitted to the hospital and delivered the baby vaginally without any complications. At 13 hour of life, baby started to develop hiccups for more than 30 minutes and his Oxygen saturation started to fall below normal. Baby developed tachypnoea with chest retraction and grunting. His Body temperature was 98°F, Pulse rate 150/min, Respiratory rate 68/min, SPO₂ 90% with O₂ at 6 litres per minute in head box. Septic screening was sent and was started on empirical antibiotics (Injection cefotaxime at 50mg/kg/dose BD and Amikacin 15mg/kg/dose OD).

The baby was admitted in paediatric ward and was kept Nil per Oral (NPO) and intravenous fluid was started.

Chest X ray showed no major radiological abnormalities. Within eight hours of initiation of antibiotics, the child started to show signs of improvement. Vitals became stable and his supplemental oxygen requirement decreased.—Blood culture report revealed growth of Salmonella species that was sensitive to ciprofloxacin, intermediate sensitive to cefotaxime, chloramphenicol, ceftazidime, ceftriaxone, cefixime, cotrimoxazole and amoxicillin. Blood culture was repeated after seven days of antibiotics which showed no growth of any organism. The child received injection cefotaxime for total duration of 10 days and injection amikacin for total duration of seven days. The child was clinically doing well, free of any complication, by this time and was discharged

home. Blood culture and High Vaginal Swab of mother were also sent after positive blood culture of the child, which were sterile.

Discussion

We have limited data on causative organism of neonatal sepsis in developing countries like Nepal, where most of the birth take place at home and where the neonatal mortality rate is still high. A brief report published in 2009 that compiled 835 cases of neonatal sepsis (blood or CSF culture positive) in infant between 7 to 59 days of life found that 13% of the isolates were non-typhoid Salmonella species⁵. The proportion of Salmonella sepsis increased in infant group after seven days of life. Salmonella sepsis was recorded in 8-9% of cases of sepsis for age group 29 to 90 days of life. Most of these non-typhoid salmonella sepsis were noted in African region, little in South Asia and East Asia and Pacific. While most of the cases were in neonates above seven days of life, few were seen before three days of life⁵. A study on Neonatal Sepsis done in Bangladesh found that Salmonella was the second most common cause for sepsis, of which above 45% were *Salmonella typhi* and almost 55% were other Salmonella species¹⁰. Salmonella species like *Salmonella newport* and *Salmonella typhimurium* has been found to cause bacteraemia and sepsis in neonates in developed countries like America and Poland, though the incidence is low in developed countries^{11,12}. Salmonella infection is acquired by consuming contaminated water and food. The most likely cause of Salmonella infection in neonate is poor hygiene of caregiver. However, since we are seeing Salmonella sepsis in neonates, and the duration of symptom may be in early neonatal period, a congenital infection (transmission) is also likely¹². There are limited publications or data regarding Salmonella sepsis in neonates in Nepal. A recent study done in Nepal, showed only one case of Salmonella sepsis in total of 65 cases of Early onset NNS during two year study period¹³. The duration of treatment for

most salmonella infection in children is 10-14 days if cephalosporin is used. However there is limited data and information on duration of treatment of Salmonella sepsis in neonates.

Conclusion

Salmonella sepsis should be considered in differential diagnosis wherever we encounter a case of neonatal sepsis, especially in developing countries like Nepal.

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