

Clinico-epidemiological spectrum of early onset neonatal sepsis in neonates admitted in NICU of a tertiary care institute

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Abstract

Background: Neonatal sepsis is a clinical syndrome characterized by signs and symptoms of infection with or without accompanying bacteremia in the first month of life.

Methods: This was a prospective observational study conducted on one hundred term neonates admitted in neonatal ICU of PDU medical college, Churu. The neonates with clinical and laboratory findings suggestive of early onset sepsis infection admitted to neonatal ICU within the first three postnatal days of life who were >37 weeks of gestation were enrolled.

Results: Respiratory distress was the most common presentation in the form of tachypnea which was seen in 63.00% neonates and chest retractions in 41.00% cases. 65.00% neonates needed supplemental oxygen. Lethargy was seen in 34.00% and refusal to feed in 22.00 cases.

Conclusion: To conclude, respiratory distress was the most common presentation in the form of tachypnoea, seen in neonates.

Keywords: Neonates, Respiratory Symptoms, NICU

Introduction

Neonatal sepsis is a clinical syndrome characterized by signs and symptoms of infection with or without accompanying bacteremia in the first month of life.^{1,2}

Neonatal sepsis may be classified into two groups : early onset neonatal sepsis (EONS) and late onset neonatal sepsis (LONS). The definition of early onset sepsis is variable from-early onset neonatal sepsis (EONS) and late onset neonatal sepsis (LONS).

The definition of early onset sepsis is variable from <3 days (American Academy of pediatrics) to <7days (centre for disease control definition based on epidemiology studies).² EONS usually presents with respiratory distress.³ Prematurity, low birth weight, foul smelling and meconium stained liquor, premature rupture of membranes, prolonged labour, more than three vaginal examinations during labor, and perinatal asphyxia constitute the main risk factors for EOS.⁴ Neonate with sepsis may present with one or more of the following symptoms and signs viz. temperature instability, lethargy, poor cry, refusal to suck, poor perfusion, prolonged capillary refill time, respiratory distress, apnea, grunting, cyanosis and gasping respiration, bradycardia/tachycardia, hypoglycemia/ hyperglycemia and metabolic acidosis. Specific features related to various systems.⁵⁻⁶

- Central nervous system (CNS): bulging anterior fontanel, vacant stare, excessive crying, stupor/coma, seizures, neck retardation.
- Cardiac: hypotension, poor perfusion, shock.

- Gastrointestinal: Feed intolerance, vomiting, diarrhea, abdominal distension, paralytic ileus, necrotizing enterocolitis.
- Hepatic: Hepatomegaly, direct hyperbilirubinemia.
- Renal: Acute renal failure.
- Skin changes: Multiple pustules, abscess, sclerema, mottling, umbilical redness and discharge.

Methods

This was a prospective observational study conducted on one hundred term neonates admitted in neonatal ICU of PDU medical college, Churu.

The neonates with clinical and laboratory findings suggestive of early onset sepsis infection admitted to neonatal ICU within the first three postnatal days of life who were >37 weeks of gestation were enrolled.

To corroborate the diagnosis of early onset neonatal sepsis (EONS) a septic screen including total leukocyte count, absolute neutrophil count, blood smear evaluation and C-reactive protein (CRP) were performed in all neonates with suspected sepsis.

Epidemiological parameters including gender of the neonate, mode of delivery, rural/urban residence were recorded in addition to the clinical profile.

Inclusion Criteria

The sepsis criteria used in the study defined by Gittoet al:⁷

- Highly probable sepsis: at least three sepsis related clinical signs, CRP>5mg/dl, at least two other altered parameters in addition to CRP, blood cultures; positive or negative.
- Probable sepsis: less than 3 sepsis –related clinical signs, CRP>5mg/dl, at least two other altered parameters in addition to CRP, blood cultures; negative.

- Possible sepsis: Less than 3 sepsis –related clinical signs, CRP<5mg/dl, less than 2 other altered parameters, blood culture; negative.

- No sepsis: CRP<5 mg/dl, no altered parameters, blood cultures; negative.

- Sepsis related clinical signs: Temperature instability, apnea, need for supplemented oxygen, need for ventilation, tachycardia/bradycardia, hypotension, feeding intolerance, abdominal distension, necrotizing enterocolitis and seizures. Parameters: CRP, other than CRP: white blood cell count, absolute neutrophil count, platelet count, and blood cultures were also recorded.

Exclusion Criteria

- Out born admitted after 72 hours of life
- Major congenital abnormality
- Maternal clinical chorioamnionitis
- Premature rupture of membranes.

Results

Table 1: Gender wise distribution

Gender	No. of cases	Percentage
Male	63	63.00
Female	37	37.00
Total	100	100.00

Higher number of cases was reported in males (63%)

Table 2: Area wise distribution

Area	No. of cases	Percentage
Rural	82	82.00
Urban	18	18.00
Total	100	100.00

Out of total 100 cases with EONS, 82.00% cases belonged to rural and 18.00% to urban area.

Table 3: Distribution of cases according to sepsis

Sepsis	No. of cases	Percentage
Highly probable	63	63.00

sepsis		
Probable sepsis	24	24.00
Possible sepsis	13	13.00
Total	100	100.00

Out of total 100 cases with EOS, 63.0% neonates had highly probable sepsis, 24.0% had probable sepsis and 13.00% neonates had possible sepsis.

Table 4: Distribution of neonates in relation to symptoms of sepsis

Symptoms	No. of cases	Percentage
Lethargy	34	34.00
Refusal to feed	22	22.00
Poor cry	9	9.00
High pitched cry	5	5.00
Hypothermia / fever	13	13.00
Cyanosis	4	4.00
Tachypnea	63	63.00
Chest retraction	41	41.00
Poor capillary refilling time	24	24.00
Shock	11	11.00
Vomiting	14	14.00
Feeding intolerance	9	9.00
Abdominal distension	5	5.00
Need for oxygen	65	65.00
Seizure	1	1.00

Respiratory distress was the most common presentation in the form of tachypnea which was seen in 63.00% neonates and chest retractions in 41.00% cases. 65.00% neonates needed supplemental oxygen. Lethargy was seen in 34.00% and refusal to feed in 22.00 cases.

Discussion

Neonatal sepsis is one of the major health problems throughout the world and one of the commonest causes of

neonatal mortality and morbidity. It is estimated to cause almost 1 million deaths that accounts for more than 25% of neonatal deaths in worldwide.⁸ Early onset sepsis is defined as bloodstream infection at less than or equal to 72 h of age.

It is generally associated with the acquisition of microorganisms from the mother and usually presents with respiratory distress and pneumonia.¹ The warning signs and symptoms are often subtle and non-specific and thus makes it difficult to establish an early clinical diagnosis.

In our study was found that early neonatal sepsis was more commonly seen in males (63%) as compared to their female (37%) counterparts. Similar pattern was observed by Sanuja Sarasam E et al, Samaga MP, Aletayeb S et al, Celicia C et al, Rabia S et al, Ahmad A et al, Karambin and Zarkesh, and Al-Shamahy et al which reported higher number of male neonatal septicaemia than female neonatal septicaemia, that correlates with present study.⁹⁻¹⁶ Probable reason for the male prepondrence might be because of males having only one x chromosome which is probably regulating the synthesis of gammaglobulins.²⁰ It was noticed that 31% babies in the study group were delivered vaginally while 69% were born by caesarian section. Similar to these findings, Sanuja Sarasam E et al revealed neonatal sepsis was more in babies delivered by caesarean section (54.45%) as compared to those delivered vaginally (47.6%). Early neonatal sepsis usually presents with respiratory distress and pneumonia. In present study respiratory distress in form of tachypnea (63%) and chest retractions (40%) was the most common clinical feature.

Conclusion

To conclude, respiratory distress was the most common presentation in the form of tachypnoea, seen in neonates.

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