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# CLINICAL PROFILE OF EARLY NEONATAL SEPSIS AND ITS OUTCOME AT A TERTIARY CARE HOSPITAL

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**Abstract**

**Introduction:** Neonatal sepsis is a syndrome of bacteraemia characterised by systemic signs and symptoms in neonatal period sepsis. It is one of the major causes of morbidity and mortality in the newborn. This study was undertaken to find the neonatal and maternal risk factors for early neonatal sepsis.

**Material and Methods**: This is a hospital based study conducted at GB Pant Hospital based on data obtained from medical records of neonates admitted in Neonatal intensive care unit in a tertiary care hospital with the diagnosis of early onset sepsis. The study was conducted for a period of one year from 01 oct 2011 to 30th Sep2012.

**Results:** There were 3486 neonatal admissions in the NICU during the study period. Out of these 131 (3.75%) patients had sepsis. Of which 71 (54.19%) patients were having early onset sepsis. Thirty four (47.88%) patients had culture positive sepsis. Among the patients with LBW 57 (5.71%) had EOS. In patients with maternal risk factor sepsis was seen in 27.8% of patients while in those without risk factors it was seen in 5 %. Thus the incidence of EOS was more in presence of maternal risk factors like home deliveries, foul smelling liquor, premature rupture of membranes and peripartum fever. The case fatality rate was about 20.77%.

**Conclusion:** The incidence of early onset neonatal sepsis can be greatly reduced by preventing maternal risk factors and good antenatal care thus reducing the morbidity and mortality of this preventable condition.

**Key words:** Neonatal Sepsis, Early Onset Neonatal Sepsis(EOS), Neonatal intensive Care Unit(NICU)

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## INTRODUCTION

Neonatal sepsis is one of the major causes of morbidity and mortality in the newborn[1].Neonatal sepsis is a syndrome of bacteraemia characterised by systemic signs and symptoms in neonatal period and is categorised in to early onset and late onset sepsis based on the onset of features suggestive of sepsis. As it is a life threatening emergency, early detection and treatment will reduce the morbidity and mortality. It is the commonest cause of mortality in neonatal intensive care units. High suspicion and early recognition of clinical symptoms is important in diagnosing neonatal sepsis. It is estimated that 20% of all the neonates develop sepsis is responsible for neonatal deaths in developing countries[2]. The aim of the present study was to identify the most common risk factors for early

onset neonatal sepsis (EOS) and its morbidity and mortality.

## MATERIAL AND METHODS:

This study was conducted in the Department of Paediatrics at G.B. Pant hospital (Associated paediatric hospital of governent medical college Srinagar).It was a cross sectional Hospital based study conducted for a period of one year from 01 Oct 2011 to 30th Sept 2012.All patients admitted to NICU with suspicion of sepsis were included in the study and were subjected to investigations including CBC, ANC, CRP, Blood culture , CSF culture (whenever applicable). Blood cultures were reported negative when they did not grow any organism at 7 days. The case records of the newborn were categorised on the basis of sepsis or no sepsis. The case files of these newborns were studied and recorded and include history, clinical evaluation and the investigations. Neonates left against the medical advice or taken elsewhere on request and discharged on request were not included in the study.

## RESULTS

There were 3486 neonatal admissions in the NICU during the study period. Out of these 131 (3.75%) patients had sepsis. Of which 71 (54.19%) patients were having early onset sepsis. Thirty four (47.88%) patients had culture positive sepsis. Among the patients with LBW 57(5.71%) had EOS. In patients with maternal risk factor sepsis was seen in 27.8% of patients while in those without risk factors it was seen in 5 %.( Table 1)

The maternal risk factors responsible for Early Onset Neonatal sepsis (EOS) were Premature rupture of membranes (PROM), foul smelling liquor and delivery conducted by dhai (table 2)

Thirty four patients had culture proven sepsis. The most common organism grown was *Pseudomonas aerugenosa* (50%) followed by *Staph aureus, K. pneumonia, S. Viridans and E coli.* (Fig 1). The associated Morbidities were pneumonia in 45(63.38), shock in 19(26.76) and others like hypoglycaemia, NEC etc (Table 3). Sixteen patients died due to EOS withcase fatality rate of 20.77%.

**Table 1: Neonatal Attributes and Maternal Risk factors in Early Onset Neonatal Sepsis**

| Neonatal category | Total number of Early Onset Neonatal Sepsis | Early Onset Neonatal Sepsis with Risk factors | Early Onset Neonatal Sepsis without Risk factors |
|---|---|---|---|
| **Total admissions** | 71/3486 ( 2.03) | 56/ 283 (19.78) | 15/3203 (0.46) |
| **Low Birth Weight** | 57/997(5.71) | 52/187 (27.8) | 5/810 (0.61) |
| **Small for gestational Age** | 9/231 (53.89) | 6/24 (25.0) | 3/207(1.44) |
| **Preterm** | 55/630 (8.73) | 48/169 (28.40) | 7/461 (1.51) |
| **Male sex** | 41/2008 2.04) | 29/167 (17.36) | 12/1841 (0.65) |

**Table 2: Maternal and Neonatal Risk Factors in Early Onset Neonatal Sepsis**

| Risk factors | Total no. | No of cases |
|---|---|---|
| **Premature Rupture of Membranes** | 215 | 43 ( 20 % ) |
| **Peripartum fever** | 29 | 2 ( 6 .89 %) |
| **Foul smelling liquor** | 24 | 7 ( 29.16% ) |
| **Delivery conducted by Dhai** | 45 | 7 ( 15.55% ) |
| **Urinary tract Infection** | 21 | 4 ( 19.04% ) |

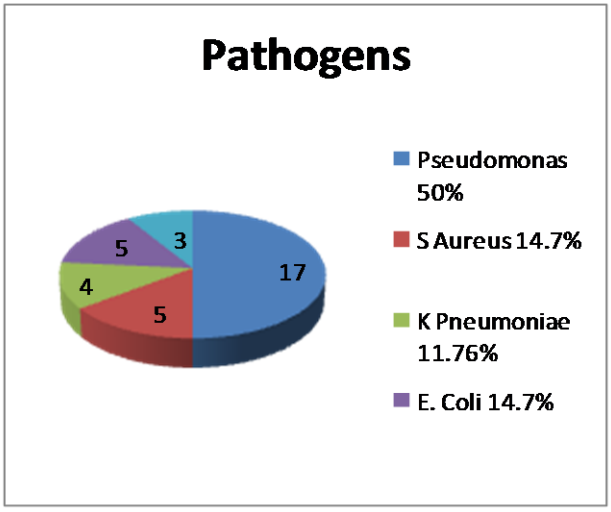


**Fig 1: Bacteriological profile of Early Onset Neonatal Sepsis (EOS)**

**Table 3: Associated Morbidity in neonates with Early Onset Neonatal Sepsis(EOS)**

| Morbidity | Total no EOS ( n =71) | Culture positive ( n=34) |
|---|---|---|
| Meningitis | 5 (7.04) | 5( 14.70) |
| Pneumonia | 45 (13.38) | 9( 26.47) |
| Shock | 19 (26.76) | 7 (20.58) |
| Necrotizing Enterocolitis | 7 (9.85) | 3 (8.82) |
| Hypoglycemia | 9 (12.67) | 7 (20.58) |
| Neonatal hyperbilurubinemia | 3 (4.22) | 2 (5.88) |

## DICUSSION

In present study overall incidence of neonatal sepsis was 37.5% which is similar to 37.6/1000 live births reported by Tallur s s etal[3] the incidence of culture proven EOS 9.7/1000 which is comparable to that reported by Kuruvillaka et al[4] from south India. Some studies from developed world have shown early incidence of neonatal sepsis 3.5 to 4.3 /1000 live births[5,6] . This lower incidence is due to probably different population characteristics and predisposing factors. There was no difference in incidence of EOS in males and females in our study, however some studies have shown male predominance in gram negative sepsis[7,8]. The incidence of EOS was 5.71% in LBW in our study whereas the incidence of EOS was 5.3% in the study by Betty Chacko et al[1] which is comparable to ours. Maternal risk factors were seen in 70% of the present study as compared to 30 % in study by Kuruvilla et al[4]. This could be because we receive neonates from far off areas and deliveries conducted mostly by Dhais. Butta and Yousuf[9] reported a significant association between EOS and maternal UTI. We also found incidence of EOS more in UTI. If there are high risk factors like prematurity LBW, SGA, or neonatal asphyxia incidence of EOS is negligible in the absence of maternal risk factors. However if maternal risk factors are present there is significant increase in risk of EOS. The commonest presentation in our study was pneumonia (63.38%) which is similar as reported by Batty Chacko et al[1]. The culture positive rate in current study was 47.88%. The commonest organism was pseudomonas similar to as repoted by Tallur etal[3] who reported Klebsella and pseudomonas to be the commonest agents. S. Aureus constitutes about 14.75 which was similar to other studies[10,11]. Case fatality rate in present study was 20.77%. This was comparable to that reported by Kuruvilla et al. Some studies have reported higher fatality rates. This may be due to lack of intensive care facilities.

## CONCLUSION

Diagnosis of EOS needs high degree of suspicion particularly should be sought in those with significant maternal and neonatal risk factors. Prevention of these risk factors especially maternal risk factors will contribute to low morbidity and mortality in neonates.

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