An Observational Study to Evaluate the Incidence of Early and Late Onset Neonatal Sepsis in a Tertiary Care Hospital
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Abstract
This is a prospective study, conducted in Department of Pediatrics affiliated teaching hospital & Dept of Pathology of Index Medical College from November 2016 to December 2018. A total of 500 neonates of both sexes, referred to neonatology unit in indoor as well as out-patient department were selected as per the inclusion and exclusion criteria adopted. Out of the total 110 cases of culture proven sepsis, early onset sepsis was seen in 61.3% while late onset sepsis was seen in 38.7% cases. The neutrophil VCS parameter is very useful for early diagnosis and evaluation of treatment efficacy in neonatal sepsis without requirement for any extra blood collection. It is simple, easy, non-time consuming and no additional cost. Combination of MNV and CRP gave better results than the usage of each marker alone.

Keywords: Incidence, Early, Late Onset, Neonatal & Sepsis.

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INTRODUCTION
According to the data from National Neonatal-Perinatal Database (NNPD) 20015-16, the incidence of neonatal sepsis in India is 30/1000 live births. The database comprising 18 tertiary care neonatal units across India reported sepsis to contribute 19 percent of all neonatal deaths [1].

‘NEONATAL SEPSIS’ or ‘SEPSIS NEONATORUM’ refers to generalized bacterial infection of infants during the first month of life. It also encompasses various systemic infections of the newborn; such as sepsicaemia, pneumonia, meningitis, arthritis, osteomyelitis and urinary tract infections. Superficial infections like conjunctivitis and oral thrush are not included in it[2,3].

McCracken et al. stated that the organisms causing neonatal sepsis differ from place to place, country to country and from nursery to nursery. In the same nursery they may vary from season to season [4].

According to McCracken and Shinefield, during 1954 to 1958, gram positive organisms especially Staphylococcus were primarily responsible for sepsis in neonates. From 1959 to 1964, majority of the cases were due to gram negative organisms, mainly Escherichia coli [5].

MATERIAL & METHOD
This is a prospective study; conducted in Department of Pediatrics affiliated teaching hospital & Dept of Pathology of Index Medical College from November 2016 to December 2018. A total of 500 neonates of both sexes, referred to neonatology unit in indoor as well as out-patient department were selected as per the inclusion and exclusion criteria adopted.

INCLUSION CRITERIA
• Neonates i.e. age from the day of birth to one month.
• Suspected of clinical sepsis[6] (presence of 3 or more of the following categories of clinical signs) :
  • Temperature instability (hypothermia, hyperthermia)
  • Respiratory signs and symptoms (grunting, apnoea, tachypnoea, cyanosis)
  • Cardiovascular signs and symptoms (bradycardia, tachycardia, hypotension)
  • Neurologic signs and symptoms ( hypotonia, lethargy, seizures) and
- Gastrointestinal signs and symptoms (feeding, intolerance, abdominal distension)

**EXCLUSION CRITERIA**
- Neonates with fungal infection
- Neonates with congenital anomalies

**PREREQUISITES DONE**
- Approval from the Ethical committee was taken.
- Informed written consent was taken from the parent/guardian.
- Detailed clinical history of both mother and the baby was collected as indicated in the patient proforma.

**RESULTS**

<table>
<thead>
<tr>
<th>Age of Onset</th>
<th>Sepsis</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>0-3 days</td>
<td>239</td>
<td>73</td>
</tr>
<tr>
<td></td>
<td>61.3%</td>
<td>66.4%</td>
</tr>
<tr>
<td>4-30 days</td>
<td>151</td>
<td>37</td>
</tr>
<tr>
<td></td>
<td>38.7%</td>
<td>33.6%</td>
</tr>
<tr>
<td>Total</td>
<td>390</td>
<td>110</td>
</tr>
<tr>
<td></td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

*p-value: 0.37*

Out of the total 110 cases of culture proven sepsis, early onset sepsis was seen in 61.3% while late onset sepsis was seen in 38.7% cases.

<table>
<thead>
<tr>
<th>Name of author</th>
<th>Year</th>
<th>Incidence of early onset sepsis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Present study</td>
<td>2016</td>
<td>61.3%</td>
</tr>
<tr>
<td>Torkaman M[7]</td>
<td>2012</td>
<td>57%</td>
</tr>
<tr>
<td>Bhat R[8]</td>
<td>2009</td>
<td>56%</td>
</tr>
</tbody>
</table>

From the above table, it is seen that the finding in the present study are comparable with other study.

<table>
<thead>
<tr>
<th>Name of author</th>
<th>Year</th>
<th>Incidence of male predominance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Present study</td>
<td>2016</td>
<td>75%</td>
</tr>
<tr>
<td>JestmiH.celik[9]</td>
<td>2011</td>
<td>51%</td>
</tr>
<tr>
<td>Sharma A[10]</td>
<td>1993</td>
<td>74.0%</td>
</tr>
</tbody>
</table>

From the above table, it is seen that the finding in the present study are comparable with other study.

**DISCUSSION**

In EOS, GBS was the most common etiologic agent, and, together with E coli, accounted for >60% of cases. Although the incidence of EOS was highest in extremely preterm infants and decreased with advancing gestational age, 43% of cases of EOS occurred in infants born at term. Remarkably, the observed EOS incidence of 0.28 in our cohort was 2-3 fold lower compared with the incidence of 0.54-0.9 per 1000 livebirths reported in other European countries and in the US[11], whereas the relative proportion of EOS cases associated with GBS and E coli was in the range of previous reports. Severity of infection was considerable with septic shock present in 26%, and a mortality of 18%, which is comparable with other studies [12].

**CONCLUSION**

The neutrophil VCS parameter is very useful for early diagnosis and evaluation of treatment efficacy in neonatal sepsis without requirement for any extra blood collection. It is simple, easy, non-time consuming and no additional cost. Combination of MNV and CRP gave better results than the usage of each marker alone.

**REFERENCES**

10. Sharma A, Kutty CK, Sabharwal U; Rathee S, Mohan H. Evaluation of sepsis screen for...