STUDY OF RISK FACTORS IN EARLY ONSET NEONATAL SEPSIS

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ABSTRACT
Introduction: Neonatal sepsis is one of the major causes of morbidity and mortality in newborn. Early onset neonatal sepsis (EONS) is a severe disease and has high mortality rate. The clinical signs of EONS are nonspecific and the confirmation of diagnosis may consume time. Therefore, the diagnostic approach is necessary by considering the risk factors. Objective: The aims of this study are to identify the risk factors of newborn infants for early onset sepsis Methods: This is a cohort retrospective study, conducted over year from July 2016 to June 2017 at neonatology department SDM college of Medical sciences and Hospital Dharwad. The sample population included newborn infants whose mother had risk factors of sepsis. The information of the risk factors from neonate and diagnoses of EONS was obtained from their medical record. There were 262 samples: 232 cases of EONS and 30 of control. Results: The results of analysis revealed 3 risk factors from mother maternal fever, foul smelling liquor, PROM >18hour and 3 risk factors from infant which were associated to EONS: APGAR score <7 at one minute Gestational <37 weeks and birth weight <1500 grams Conclusion: Based on this study, we concluded that the risk factors of EOS maternal fever foul smelling liquor, PROM >18 hours, low APGAR score, gestational age <37 weeks and very low birth weight and were helpful in the early management of sepsis.

KEYWORDS : Early Onset Neonatal Sepsis, Risk Factors, neonate

Introduction
Neonatal mortality (NM) until nowadays is still the highest mortality in human life. It has a close relation to infant mortality rate (IMR), which used as the indicator of health development in countries.1 In 2009, WHO reported that there is 3.3 million of neonatal mortality from 6 million of infant mortality.2 Neonatal sepsis accounts for 33% of neonatal mortality in developing countries.3 Neonatal sepsis is a clinical syndrome occurs because of invasion of microorganism into the blood in the first month of life.4 Basically, the fetuses were still wrapped by layers of amnion adequately shielded from bacterial flora’s mother because of the cervical plug, which is the placenta barrier and antimicrobial proteins and peptides in it.5, 6 Even though the probably of microorganism contamination can occurs by a several ways, such as transplacental, or ascending infection from cervical or by the birth canal during the birth process.7 On exposed, the babies are shaping the immune response to maintain their body from the infection.8 Several factors of mother, babies, and environment are contribute to the infection exposed and non optimal of NM immunologic response so as the newborn become susceptible to be infection.9 There is a dilemma on the sepsis management, that if there is a delay of treatment will increase the mortality rate of over 50%. If not be therapy while the over diagnosis happens, due to the non particular of clinical illustration will make the over treatment and harm the patient and his/her family. Hence, the clinic decision by the clinicians against the newborn that is apparently healthy or with a minimal of sepsis symptom. Furthermore, even asymptomatic bacteremia can be done accuracy and faster with a risk factor consideration considering of several support examine to confirm the diagnosis need a lot of time.10 This study aims to identification the risk factors from the mother and neonate which predispose to development of EONS.

2. Materials and Methods: Figure 1. Flow diagram for study

Table 1 shows the characteristics of study sample.

<table>
<thead>
<tr>
<th>Number</th>
<th>Sample characteristics</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Sex: Male</td>
<td>56%</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>46%</td>
</tr>
<tr>
<td>2</td>
<td>Maternal fever ≥38C</td>
<td>11%</td>
</tr>
<tr>
<td></td>
<td>Maternal fever &lt;38C</td>
<td>88%</td>
</tr>
<tr>
<td>3</td>
<td>PROM &gt;18hours</td>
<td>27%</td>
</tr>
<tr>
<td></td>
<td>PROM &lt;18hours</td>
<td>73%</td>
</tr>
<tr>
<td>4</td>
<td>Meconium stained liquor</td>
<td>15%</td>
</tr>
<tr>
<td></td>
<td>No meconium stained liquor</td>
<td>85%</td>
</tr>
<tr>
<td>5</td>
<td>APGAR score &lt;7 at one minute</td>
<td>31%</td>
</tr>
<tr>
<td>6</td>
<td>Gestational age &lt;37weeks</td>
<td>33%</td>
</tr>
<tr>
<td>7</td>
<td>Birth weight &lt;1500 grams</td>
<td>35%</td>
</tr>
</tbody>
</table>

Total of the study samples with EONS was 232, with 130 (56%) male and 102 (46%) female while no EONS reported from control. There are 11.0% neonates with the maternal fever ± foul smelling liquor while PROM >18 hour was noted in 27%. There are 15% neonates with the meconium stained amniotic fluid (MSAF), while rest of them 85% are not. Neonatal sepsis occurring in neonates with apgar score <7 at one minute was 31%, gestational age <37 weeks 33% and birth weight <1500 grams 35%.

Discussion: This study obtained the EONS incidence as 28% from 232 of newborns with risk factors. This incidence is not different with the reported by Canadian Pediatrics Society, which the EONS occurrence prevalence by the mother with infection risk factor about 20%,11 Chacko and Sohi are also report the EONS incidence is 20.6% in newborn.12 Sexual dimorphism from the human immune response is quite clear; female produces the more active of cellular immune reaction and humoral so that they are more resistant to the infection.13 and our result shows there is relationships between the sex to the EONS occurring more frequently in male than female infants. The study in
India also reported that there is no significant between both of the sex with infection rate between male (2.05%) and female (2.08%).
We also found that the value of APGAR score <7 at one minute increased significantly with p = 0.001. Chacko and Sohi also reported the EONS occurrence on infants with APGAR score <7 at one minute increased 11.1 times significant with p = 0.001. 12 Age also found that the value of APGAR score <7 at one minute increased significantly with p = 0.001. 12

The possibility of EONS high if more than one risk factor is present. We suggest to do multicenter investigation to include a large sample with a better methods to assess the neonatal risk factor relationship to the EONS.

Competing interests and funding: none

References
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17 Oddie S, Emberton N. Risk factors for early onset neonatal group b streptococcal sepsis; Case Control Study. BMJ. 2002;325(7359): 388-381.