

**BACTERIOLOGICAL PROFILE AND OUTCOME OF NEONATAL SEPSIS IN PRETERM BABIES OF TERTIARY MEDICAL COLLEGE AND HOSPITAL**

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**ABSTRACT**

**Objective:** In this study our main goal is to evaluate bacteriological profile and outcome of neonatal sepsis in preterm babies of tertiary medical college and hospital. **Method:** this prospective observational and experimental study was carried out at Sir Salimullah Medical College and Mitford Hospital, Dhaka from July 2010 to October 2011 among 80 preterm babies. **Results:** most of the patients belong to 'up to 24 hours', 50(62.5%), followed by 21(26.30%) belong to 24-48 hours age group, 9(11.30%) belong to 48-72 hours age group. During the study, E.coli was found in 3(42.86%) and Coagulase Negative Staphylococcus (CONS) found in 1(14.28%) cases at follow up before discharge. Among the babies 31(38.8%) babies were discharged with advice (DA), another 31(38.8%) were discharged on risk bond (DORB), 3(3.8%) babies were discharged on request (DOR) and 15(18.8%) expired. **Conclusion:** From our study we can conclude that, the originality of this study resides in dealing with all aspects of culture proven neonatal sepsis- the causative organisms, used antibiotics, the outcome of mortality and morbidity. Collection of up-to-date & site-specific data is needed for further study.

**KEYWORDS:** Bacteriological profile, neonatal sepsis, preterm babies.

**INTRODUCTION**

Neonatal sepsis is defined as a disseminated disease with positive blood culture during the first month of life, and encompasses various systemic infections of the newborn such as septicemia, meningitis, pneumonia, arthritis, osteomyelitis and urinary tract infection.<sup>[1]</sup> It is more common in developing countries compared with developed countries.<sup>[2]</sup> Neonatal sepsis is the most common cause of neonatal mortality.<sup>[3]</sup> Studies have recorded an incidence of neonatal sepsis, varying between 11 and 24.5 per 1000 live births in some Asian countries.<sup>[4]</sup> It is responsible for about 30-50% of the neonatal deaths. Depending on the onset of symptoms, it can be classified into early onset sepsis within 72 h of life and late onset sepsis usually after 72 h of age.<sup>[5]</sup>

Knowledge about potential risk factors would help in the early diagnosis of sepsis. Early signs of sepsis are frequently non-specific and subtle. It has been one of the major diagnostic problems for physicians due to the non-specificity of its symptoms and the absence of a reliable paraclinical marker. Furthermore, the gold standard for detection of neonatal sepsis (i.e. blood culture) is unreliable when intrapartum antibiotics have been administered.<sup>[6]</sup>

In this study our main goal is to evaluate bacteriological profile and outcome of neonatal sepsis in preterm babies of tertiary medical college and hospital.

**OBJECTIVE****General objective**

To assess the bacteriological profile and outcome of neonatal sepsis in preterm babies of tertiary medical college and hospital.

**Specific objective**

- To identify bacteria from blood culture findings.
- To use antibiotics according to culture and sensitivity.

**METHODOLOGY****Types of study**

This was a prospective observational and experimental study.

**Study place and period**

This study was conducted at Neonatal Care Unit (NCU) of Sir Salimullah Medical College and Mitford Hospital, Dhaka among 80 preterm babies from July 2010 to October 2011.

**Inclusion criteria**

Preterm babies within 72 hours of life admitted in Neonatal Care Unit.

**Sampling technique**

Patients were selected by purposive sampling.

**Study procedure**

Informed consent was taken from mother, father or any legal attendant of the baby. Information was collected by reviewing the clinical and laboratory findings. Data was collected in a structured questionnaire by the principal investigator. Detail records of gestation, birth-weight, gender and whether the baby transferred after delivery elsewhere were included. Blood culture for bacteria was done in each preterm baby admitted at NCU on admission and at follow up before discharge. Cultures were plated on selective media for isolation of bacteria. Duration of antibiotics, intubation, parenteral nutrition,

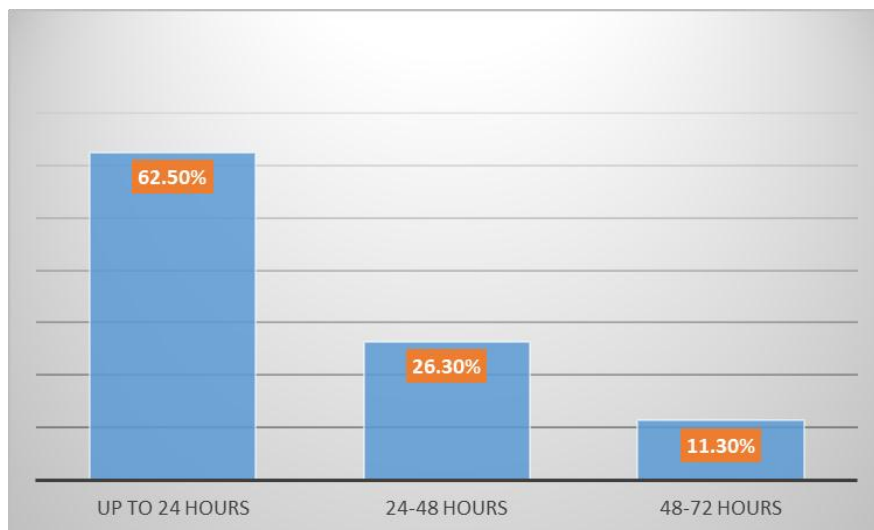
total central catheter use (umbilical venous catheter, peripherally inserted central catheter), corticosteroids and theophylline were noted and the duration defined in days (with any portion of a day constituting 1 day of treatment). The specimens were placed in a dry medium and taken to the Microbiological Laboratory.

**Data Analysis**

Analysis was performed by using a computer based statistical program SPSS (Statistical Package for Social Sciences) version 12, where descriptive analysis was done for percentage and mean value.

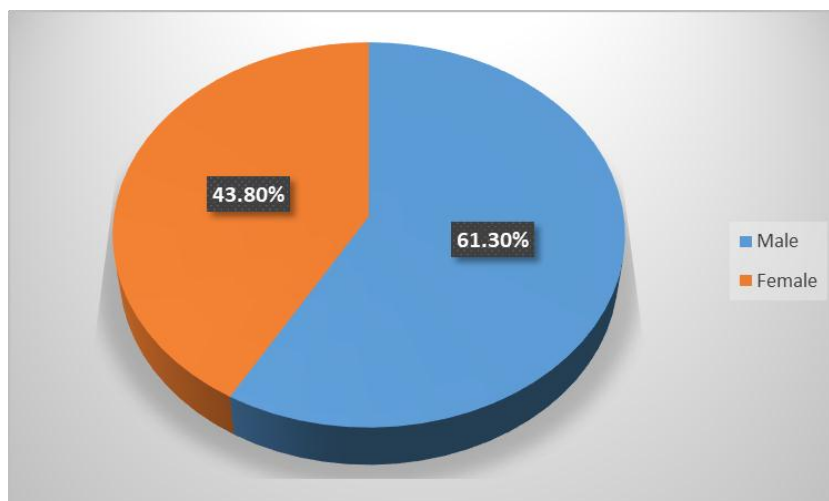
**RESULTS**

In figure-1 shows age distribution of the patients where most of the patients belong to 'up to 24 hours', 50(62.5%), followed by 21(26.30%) belong to 24-48 hours age group, 9(11.30%) belong to 48-72 hours age group. The following figure is given below in detail:



**Figure 1: Age distribution of the patients.**

In figure-2 shows gender distribution of the patients where most of the patients were male, 61.30%. The following figure is given below in detail.



**Figure 2: Gender distribution of the patients.**

In table-1 shows mean NCU stay of the patients. The mean ( $\pm$ SD) NCU stay of the babies were 6.6( $\pm$ 4.6). The following table is given below in detail:

**Table 1: Mean NCU stay.**

NCU stay	Mean ( $\pm$ SD)
NCU stay	6.6( $\pm$ 4.6)

In table-2 shows blood culture findings on admission of the patients. Among the organisms *Acinobacter* were present in 2 (2.5%) patients, *Citarobacter* in 1(1.3%) patient etc. The following table is given below in detail:

**Table 2: Blood culture findings on admission.**

Growth on blood culture	Frequency (%)
<b>Organisms</b>	
<i>Acinobacter</i>	2(2.5%)
<i>CONS</i>	2(2.5%)
<i>Pseudomona</i>	2(2.5%)
<i>E.coli</i>	1(1.3%)
<i>Citarobacter</i>	1(1.3%)
<i>Serratia</i>	1(1.3%)
<i>Staph. aureus</i>	1(1.3%)
<i>Staph. epidermidis</i>	1(1.3%)

Table 3 shows that blood culture findings at follow up before discharge where *E. coli* was found in 3(42.86%) and *Coagulase Negative Staphylococcus (CONS)* found in 1(14.28%) cases. The following table is given below in detail:

**Table 3: Blood findings at follow up before discharge.**

Growth on Blood culture	n (%)
<b>Organisms</b>	
• <i>E.coli</i>	3(42.86%)
• <i>CONS</i>	1(14.28%)

In table-4 shows outcome of babies in the study after treatment. Among the babies 31(38.8%) babies were discharged with advice (DA), another 31(38.8%) were discharged on risk bond (DORB), 3(3.8%) babies were discharged on request (DOR) and 15(18.8%) expired. The following table is given below:

**Table 4: Outcome of babies in the study.**

Outcome of babies	n (%)
<b>Discharged with advice (DA)</b>	31(38.8%)
<b>Discharged on risk bond (DORB)</b>	31(38.8%)
<b>Discharged on request (DOR)</b>	3(3.8%)
<b>Expired</b>	15(18.8%)

## DISCUSSION

*E coli* was found in 3(42.86%) and *Coagulase Negative Staphylococcus (CONS)* found in 1(14.28%) cases during blood culture findings at follow up before discharge. The reduction of number of organisms at follow up in blood culture may be found due to administration of several antibiotics during NCU treatment. Our findings are supported by one study.<sup>[5]</sup>

In one study reported that, among Gram negatives organisms, most cases were due to *Klebsiella pneumoniae* and *Serratia* and commonest Gram-positive organisms was *Staphylococcus aureus*. *Klebsiellapneumoniae* was the major organism for both early onset and late onset sepsis.<sup>[6]</sup>

*Klebsiellapneumoniae* is emerging as a common bacterium in hospital settings<sup>7-8</sup> But other study revealed that *Pseudomonas aeruginosa* was the most common cause of neonatal sepsis followed by *Klebsiella pneumoniae* and *Escherichia coli*.<sup>9</sup> In similar studies said that, *E. coli* was the leading cause of neonatal sepsis followed by *Klebsiella pneumoniae*.<sup>[10-12]</sup>

In one article reported that, the mortality rate was low (9.38%) which may be due to presence of adequate supportive facilities in the study hospital, since this is a tertiary care hospital and NICU provide level 3 care and other logistic support.<sup>8</sup> In the present study among the babies 31(38.8%) babies were discharged with advice (DA), another 31(38.8%) were discharged on risk bond (DORB), 3(3.8%) babies were discharged on request (DOR) and 15(18.8%) expired.

## CONCLUSION

From our study we can conclude that, the originality of this study resides in dealing with all aspects of culture proven neonatal sepsis- the causative organisms, used antibiotics, the outcome of mortality and morbidity. Collection of up-to-date & site-specific data is needed for further study.

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