The sociodemographic characteristics of neonatal sepsis in preterm babiesof tertiary medical college and hospital

Dr. Md. Shafiqul Islam[1],Dr.Shah Muhammad Masuduzzaman[2], Dr. Md. Jamshed Alam [3],Dr. Mohammad Jahangir Alam [4], Dr.Mohammad Forhad Hossain[5], Dr. Nazmul Hossain[6], Dr. Mohammad Shawkat Hossain Khan[7]

[1.] *Assistant Professor, Department of Pediatrics, Sheikh Hasina Medical College, Tangail, Bangladesh.*
[2.] *Assistant Professor, Department of Pediatrics, Sheikh Hasina Medical College, Tangail, Bangladesh.*
[3.] *Assistant Professor, Department of Pediatrics, Sheikh Hasina Medical College, Tangail, Bangladesh.*
[4.] *Assistant Professor, Department of Pediatrics, Sheikh Hasina Medical College, Tangail, Bangladesh.*
[5.] *Assistant Professor, Department of Pediatrics, Sheikh Hasina Medical College, Tangail, Bangladesh.*
[6.] *Assistant Professor, Department of Pediatrics, Sheikh Hasina Medical College, Tangail, Bangladesh.*
[7.] *Assistant Professor, Department of Pediatrics, Sheikh Hasina Medical College, Tangail, Bangladesh.*
Corresponding Author: Dr. Md. Shafiqul Islam

Abstract:
Objective: In this study our main goal is to evaluate the sociodemographic characteristics of neonatal sepsis in preterm babiesof tertiary medical college and hospital. Method: this observational study was carried out at Sir Salimullah Medical College andMitford Hospital, Dhaka from July 2010 to October 2011 among 80 preterm babies. Results:among the babies 50(62.5%) babies were in age group 'up to 24 hours', 21(26.3%) babies were in age group '24-48 hours' and 9(11.3%) babies in '48-72 hours' group. Also, 49(61.3%) babies were male and 31(38.8%) were female,3(3.8%) babies had extreme low birth weight (ELBW), 16(20.0%) had very low birth weight (VLBW), 57(71.3%) had low birth weight (LBW) and 4(5.0%) had normal birth weight (≥2500gm).Conclusion:From our study we can say that, neonatal infections and associated deaths can be reduced by identifying and following up high-risk mothers and newborns and promoting facility delivery, clean cord care and hand washing in resource-poor countries likeBangladesh where the burden of clinically ascertained neonatal infections is high. Further research is neededto measure the burden of infections in the entire neonatal period, particularly in the 1st week and itsassociation with essential newborn care.
Keywords: Sociodemographic characteristics, neonatal sepsis, preterm babies, hand washing.

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I. Introduction

Neonatal sepsis is common in preterm babies. [1][2] Several host factors are responsible for increased susceptibility of preterm babies to infection as they have poor immune status and impairment of granulocyte function, lower transplacental transfer of maternal IgG (IgG transfer starts after 12 weeks of gestation and mostly after 32 weeks), low complement level and hypogammaglobulinaemia. Birth weight bears an inverse relationship with sepsis and low birth weight perhaps the most important and widely accepted risk factor for neonatal sepsis. There is marked risk in sepsis rate from 2 per 1000 live birth in infant weighing >2500 gm to about 150 per 1000 live birth in those weighing <1500 gm which confirms the significance of birth weight on neonatal sepsis. [3]

The current neonatal mortality rate for Bangladesh in 2018 was 17.1 deaths per 1000 live births. In Bangladesh major cause of deaths is neonatal infection and about 60% of neonatal death are presumed to early onset sepsis. [4][5]

Reports of the epidemiology of neonatal sepsis from the developing countries are few. They have however shown important difference in the pattern and antibiotic sensitivities of pathogens compared with reports from Europe and North America.

In this study our main goal is to evaluate the sociodemographic characteristics of neonatal sepsis in preterm babiesof tertiary medical college and hospital.

Objective:
General objective:
- To assess the sociodemographic characteristics of neonatal sepsis in preterm babiesof tertiary medical college and hospital.

Specific objectives:
- To detect percentage of weight category among babies.
- To detect percentageof gestational age category.

II. Methodology

Type of study	Observational study.
Place of study	Neonatal Care Unit (NCU) of Sir Salimullah Medical Collegeand MitfordHospital, Dhaka.
Study period	July 2010 to October 2011.
Study population	Total 80 preterm babies within 72 hours of life admitted in Neonatal Care Unit.
Sampling technique	Purposive

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.
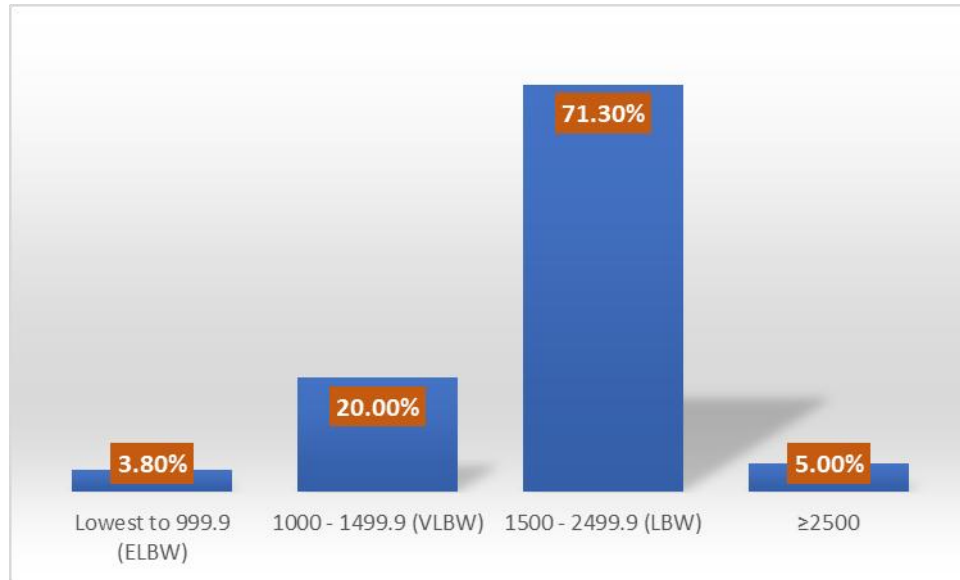
III. Results:

In table-1 shows sociodemographic status of the patients where among the babies 50(62.5%) babies were in age group 'up to 24 hours', 21(26.3%) babies were in age group '24-48 hours' and 9(11.3%) babies in '48-72 hours' group. Also,49(61.3%) babies were male and 31(38.8%) were female. The following table is given below in detail:

Table-1: Sociodemographic status of the patients

Age group	Frequency (%)
Up to 24 hours	50(62.5%)
24-48 hours	21(26.3%)
48-72 hours	9(11.3%)
Gender of the babies	Frequency (%)
Male	49(61.3%)
Female	31(38.8%)

In figure-1 shows percentage of weight among babies.3(3.8%) babies had extreme low birth weight (ELBW), 16(20.0%) had very low birth weight (VLBW), 57(71.3%) had low birth weight (LBW) and 4(5.0%) had normal birth weight (≥2500gm). The following figure is given below in detail:

Figure-1: Percentage of weight among babies.

In table-2 shows distribution of the babies according to gestational age where 4(5.0%) babies were extreme preterm (gestational age <28 weeks), 12(15.0%) babies were very preterm (gestational age 28 to <32 weeks) and 64(80.0%) babies were preterm (gestational age 32 to <37 weeks). The following table is given below in detail:

Table-2: Distribution of the babies according to gestational age

Gestational age	Frequency (%)
<28 weeks	4(5.0%)
28 to <32 weeks	12(15.0%)
32 to <37 weeks	64(80.0%)
Total preterm babies	80(100%)

In table-3 shows distribution of the babies according to age of the mother where mean age of the mother was 23.8(±4.2) years. The following table is given below in detail:

Table-3: Distribution of the babies according to age of the mother

Age of the mother	(n=80)
Mean (±SD)(years)	23.8(±4.2)
Range (years)	16-38

In table-4 shows distribution of the babies according to mode of delivery where 41(51.3%) babies were born by NVD, 38(47.5%) by LUCS and 1(1.3%) by precipitated labour. The following table is given below in detail:

Table-4: Distribution of the babies according to mode of delivery

Mode of delivery	Frequency (%)
NVD	41(51.3%)
LUCS	38(47.5%)
Precipitated labor	1(1.3%)
Total	80(100%)

In figure-2 shows difficulty in labour of the mother among babies where difficulty in labor was experienced by 43(53.7%) babies' mother. The following figure is given below in detail:
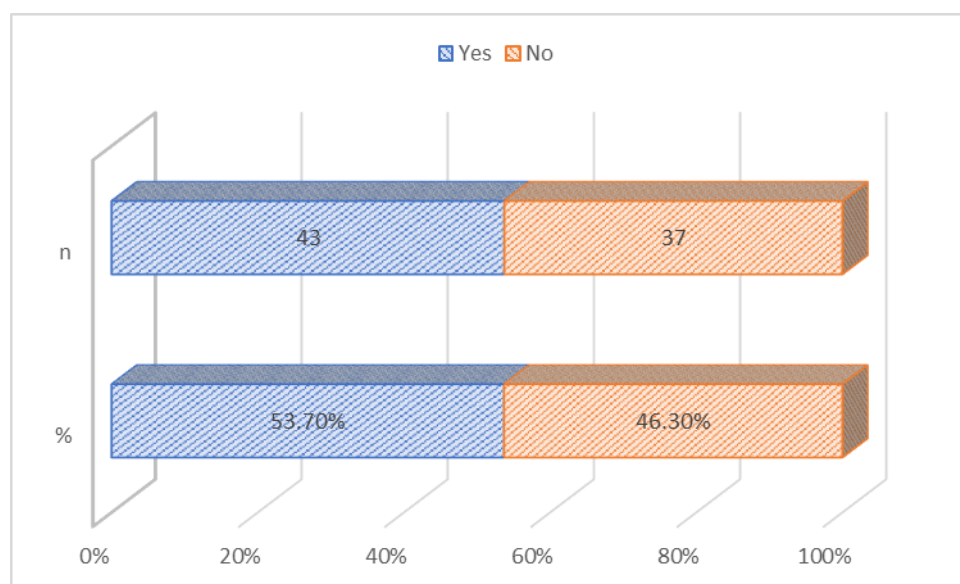
Figure-2: Difficulty in labour of the mother among babies

IV. Discussion

Neonatal septicemia is still a serious condition with attending high mortality. Gender incidence of neonatal sepsis shows male preponderance. In our study it was also the same, where 49(61.3%) babies were male and 31(38.8%) were female. This finding is in accordance with one study where they also found male preponderance. [5]

But on the other hand, few studies have shown nearly equal rate of infection. Male and female ratio in one study was 39:17 (n=50).[6] The usual male preponderance in neonatal sepsis may be due to X-linked factor. A gene located on the X-chromosomes and isinvolved with the function of thymus or with synthesis of immunoglobulin has been postulated. The female has a double dose of gene and thus might possess a greater resistance to infection.

Prematurity is a widely accepted risk factor in neonatal sepsis [7][8]. In our study (3.8%) babies had extreme low birth weight (ELBW), (20.0%) had very low birth weight (VLBW), (71.3%) had low birth weight (LBW) and (5.0%) had normal birth weight (≥2500gm).

Possible explanation is: (a) maternal genital tract infection is considered tobe a significant cause of premature labour with increased risk of vertical transmission to the newborns. (b) Premature infants has less developed immune system. (c) Premature infants are more likely to have disease such as hyaline membrane disease (HMD) and necrotising enterocolitis (NEC) which are often complicated by infection. (d) Premature infants may require intravenous access or endotracheal tubes which provide a portal of entry or impair clearance mechanism. The increased susceptibility is inversely proportional to gestational age.[9]

V. Conclusion

From our study we can say that, Neonatal infections and associated deaths can be reduced by identifying and following up high-risk mothers and newborns and promoting facility delivery, clean cord care and hand washing   in resource-poor countries like Bangladesh where the burden of clinically ascertained neonatal infections is high. Further research is needed to measure the burden of infections in the entire neonatal period, particularly in the 1st week and its association with essential newborn care.

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