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Hematology

The Sociodemographic Status of Neonatal Sepsis Patients

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Abstract **Original Research Article**

Objective: In this study our main goal is to evaluate the sociodemographic status of neonatal sepsis patients. ***Methodology:*** This Cross-sectional study carried out in the neonatal unit of BSMMU during the period from November January 2017 to December 2018. During the study total no of sample was 60 who were randomly collected from the neonatal ward. 30 newborns were taken as case and 30 were taken as control. Blood was collected in aseptic manner from the dorsum of the hand or anticubital vein. In three patients CSF was collected in between the L_4 and L_5. ***Results:*** During the experiment among the cases more number is LBW (83.3%) compare to that of normal birth weight (16.7%).prolonged rupture of membrane was only in 36.7% cases. Also, capillary refill time was ≥3 seconds in 4 patients (13.3%) of sepsis group, against none in control group. ***Conclusion:*** From our study we can conclude that Several maternal, foetal and environmental factors have been found to have predictive significance in detection of neonatal sepsis. Further study is needed for better outcome.

Keywords: Rupture of membrane, Neonatal sepsis, Capillary refill time.

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 transfer starts after 12 weeks of gestation and mostly after 32 weeks), low complement level and hypogamma globunaemia. 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].

In Bangladesh neonatal mortality is 45 per 1000 live birth and perinatal mortality 52 per 1000 live birth. In contrast India has PNMR 44 (though national neonatology from shows PNMR has 71.6 per 1000 live birth). Major cause of PNMR is neonatal infection and about 60% of neonatal death are presumed to early onset sepsis [4].

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. Thus, exploration of result of epidemiology from industrialized to developing nations may not be appropriate. Furthermore, most of the information are derived from tertiary care hospital, little is known about epidemiology of neonatal sepsis in primary care hospital [3]. In this study our main goal is to evaluate the socio-demographic status of neonatal sepsis patients.

OBJECTIVE

General Objective

- To evaluate the sociodemographic status of neonatal sepsis patients.

Specific Objective

- To detect birth weight of neonates.
- To identify duration of rupture of membrane

METHODOLOGY

Type of study	**Cross-sectional study.**
Place of study	Neonatal unit of BSMMU, Dhaka
Study period	January 2017 to December 2018
Study population	Total no of sample was 60 who were randomly collected from the neonatal ward.
Sampling technique	Purposive

METHOD

During the study, 30 newborns were taken as case and 30 were taken as control. Blood was collected in aseptic manner from the dorsum of the hand or anticubital vein. In three patients CSF was collected in between the L_4 and L_5.

Statistical Analysis

First data were edited to the validity and consistency of the data. After proper verification data were coded and entered into computer by using SPSS software programs. Descriptive analysis was done by percentage, mean and standard deviation. Association was observed by appropriate statistical test at 95% confidence interval eg. odds ratio, Chi-squiare, t-test.

RESULTS

In Figure-1 shows gestational age of the neonates (n=60). In this figure there is a greater number of preterm (63.3%) in cases compare to that of term (36.7%). The following figure is given below in detail:

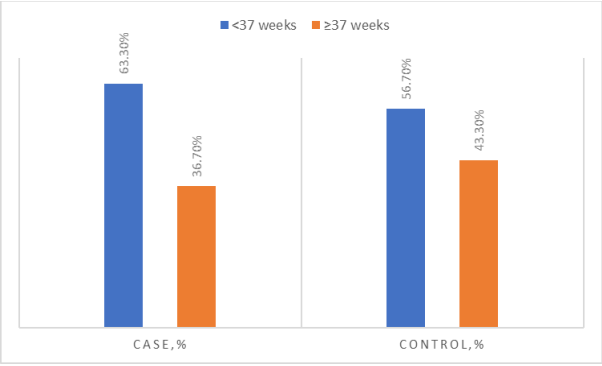

Fig-1: Gestational age of the neonates (n=60)

In Figure-2 shows gender distribution of the patients where male preponderance (56.7%) among the septic cases. The following figure is given below in detail:

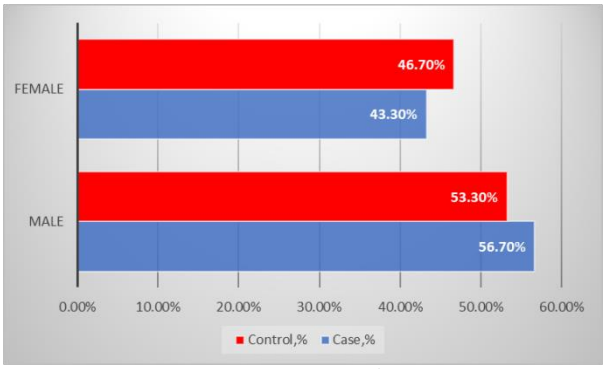

Fig-2: Gender distribution of the patients

In Table-1 shows birth weight of neonates. Among the cases more number is LBW (83.3%) compare to that of normal birth weight (16.7%). The following table is given below in detail:

Table-1: Birth weight of neonates (n=60)

Weight	GROUP	
	Case	Control
<2500 gm	25(83.3%)	22(73.3%)
≥2500 gm	5(16.7%)	8(26.7%)

χ^2 - 0.266; p value- 0.064

In Table-2 shows duration of rupture of membrane where prolonged rupture of membrane was only in 36.7% cases. The following table is given below in detail:

Table-2: Duration of rupture of membrane (n=60)

Duration of ROM	GROUP		χ^2 test	p value
	Case	Control		
<12 hrs	12(40.0%)	20(66.7%)	0.082	0.86
≥12 hrs	7(23.3%)	3(10.0%)		
≥24 hrs	11(36.7%)	7(23.3%)		

In Figure-3 shows distributions of the patients according to capillary refill time where capillary refill time was ≥3 seconds in 4 patients (13.3%) of sepsis group, against none in control group. The following figure is given below in detail:

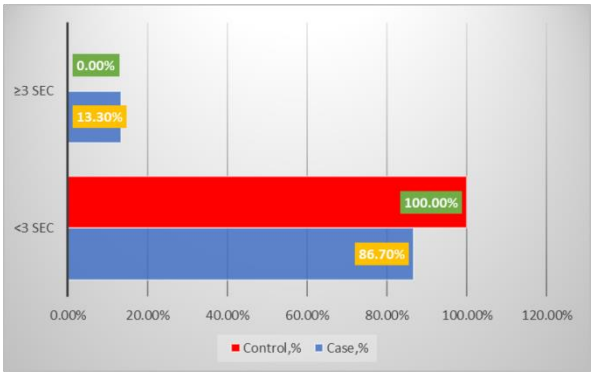

Fig-3: Distributions of the patients according to capillary refill time

In Figure-4 shows leukocyte count of neonates where leukopenia in 43.3% of cases vs none in control group leukocytosis in 13.4% cases vs 10% in control. The following figure is given below in detail:

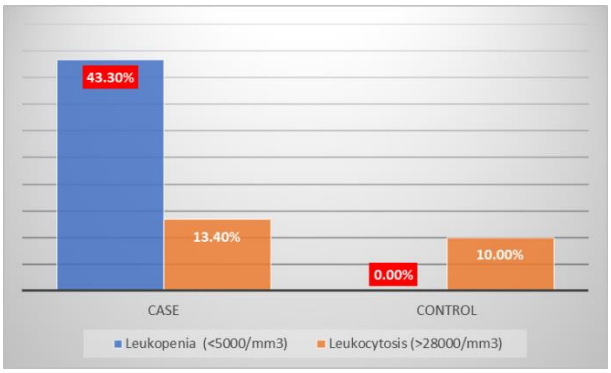

Fig-4: Leukocyte count of neonates

In Table-3 shows distribution of the patients according to PBF where PBF suggestive of sepsis in 8 cases (26.7%) compared to none in control. The following table is given below in detail:

Table-3: PBF (n=60)

	GROUP	
	Case	**Control**
Non-specific morphology	22(73.3%)	30(100.0%)
Suggestive of sepsis	8(26.7%)	0(0.0%)

$\chi^2 = 0.002$; $p < 0.001$

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. 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 this study was 17:13, which was 39:17 (n=50) in another study [6]. The usual male preponderance in neonatal sepsis may be due to X-linked factor. A gene located on the X-chromosomes and involve 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 sepsis was also more found in premature group (63.3%). Similar observation was also found in other studies. One report showed case fatality was 33.3% in premature group were as 17.7% in case group in case group in NICU [8].

Possible explanation is: (a) maternal genital tract infection is considered to be 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.

Capillary refill time bears a bad prognosis. In our study it was ≥3 seconds in 4 patients (13.3%) in case group (n=30), where as in control group all the patients (n=30) revealed capillary refill time <3 second.

Leukopenia is commonly associated with neonatal sepsis though it may also be associated with leukocytosis. In our study 43.3% had leukopania, 13.4% had leukocytosis and normal leukocyte count was found in 41.3% case group.

PBF guides a lot towards the diagnosis of neonatal sepsis. Presence of toxic granules, band form, immature to mature neutrophil ratio- all are very helpful in the diagnosis of neonatal sepsis. Unfortunately, our study showed that PBF was found only in 26.7% cases where as 73.3% cases revealed nonspecific morphology.

CONCLUSION

From our study we can conclude that Several maternal, foetal and environmental factors have been found to have predictive significance in detection of neonatal sepsis. Further study is needed for better outcome.

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