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## Research Article

### CLINICAL AND BACTERIOLOGICAL PROFILE OF NEONATAL SEPTICEMIA

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Neonatal sepsis, low birth weight,  
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#### ABSTRACT

**Background:** Neonatal sepsis is a clinical syndrome characterized by systemic signs of infection and accompanied by bacteremia in the first month of life. Vulnerability of neonates to infections increases with factors like low birth weight, duration of hospital stay, surgical procedures, and bacterial colonization.

**Method:** The present study was conducted in the department of Microbiology of Maharishi Markandeshwar institute of medical science and research, Mullana, intended to characterize the clinical and microbial spectrum involved in sepsis.

**Result:** In both suspected and culture proven sepsis cases, majority of the neonates were male and low-birth weight babies. The incidence of Gram-negative sepsis was more than gram-positive sepsis. Acinetobacter was the most common organism isolated.

**Conclusion:** Neonatal sepsis is a substantial contributor to mortality and morbidity.

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#### INTRODUCTION

Neonatal septicemia is a substantial trigger of morbidity and mortality in the newborn, particularly in LBW infants. According to world health organization (WHO) every year there are about 5 million deaths due to neonatal infections and 98% of them occur in developing countries<sup>1</sup>. Neonates are susceptible to sepsis due to immature immune system, prematurity, low birth weight, respiratory problems and maternal infections.

#### METHOD

Three hundred twenty five blood samples were collected from clinically suspected neonatal septicemic cases, in the department of Microbiology, MMIMSR, Mullana, Ambala. Ethical clearance was taken from ethical committee. Isolation and identification was done by standard microbiological method.

#### RESULT

Among 325 suspected cases, blood culture positivity rate was found to be 33.85% (Table I).

**Table I** Rate of Culture positive cases in clinically suspected cases of neonatal septicemia

Total no. Clinically suspected neonatal septicemia cases	Total no. Of culture positive cases
325	110(33.85%)

Table I-Shows that out of total 325 cases of neonatal septicemia the culture positive cases were 110 hence the culture isolation rate was (33.85%).

Gram-negative isolates were 64.49% and gram positive were 35.51% (Table II).

**Table II** Distribution of bacterial isolates

Total number of bacterial isolates	Gram positive isolates		Gram negative isolates	
	Organism	N=38(35.51%)	Organism	N=69(64.49%)
107	Staphylococcus aureus	23(60.53%)	Acinetobactersp	26(37.68%)
	Staphylococcus epidermidis	8(21.05%)	Klebsiellasp	20(28.98%)
	Enterococcus	7(18.42%)	Escherichia coli	10(14.49%)
			Pseudomonas sp	6(8.69%)
			Citrobactersp	4(5.8%)
		Enterobacter	2(2.89%)	
		Alcaligenesfaecalis	1(1.45%)	

**Table II-** Illustrates distribution of bacterial isolates, showing Gram negative (64.49%) was predominant than gram positive (35.51%). In gram negative acinetobacterspp was 37.68% followed by klebsiella(28.98%), Ecoli(14.49%), pseudomonas sp(8.69%), Citrobacter spp (5.8%), Enterobactersp(2.89%), Alcaligenes faecalis (1.45%). However, in Gram positive (35.51%) staph aureus (60.53%) was predominant followed by staph epidermidis(21.05%) and Enterococcus(18.42%).

In both suspected and culture proven cases, majority of neonates were male and low birth weight babies. Male to female ratio was 2.05:1 (Table III). Feeding difficulty, fever and respiratory distress were the most common presentations (Table IV).

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**Table III** Patient's characteristics of neonatal septicemia (n = 110)

Gender	Male	74 (67.27%)
	Female	36 (32.73%)
GESTATION	PRETERM	29 (26.36%)
	TERM	81 (73.64%)
BIRTH WEIGHT (g)	Very low <1500	24 (21.82%)
	Low 1500-2500	74 (67.27%)
	>2500	12 (10.91%)

**Table III-** Exhibits demographic characteristics of neonatal septicemic cases. Male cases 74 (67.27%) were more than female cases 36 (32.73%). Pre term cases were 29 (26.36%), term cases were 81 (73.64%). Birth weight of neonates less than 1500g were 24 (21.82%), 1500-2500g were 74 (67.27%), more than 2500g were 12 (10.91%)

**Table IV** Profile of neonates with suspected sepsis

Clinical Signs/Symptoms	Total (N=110)
Convulsions	3(2.73%)
Difficulty feeding	46(41.82%)
Fever	23(20.91%)
Cold	4(3.64%)
Diarrhea	2(1.82%)
Discharge	1(0.91%)
Vomiting	2(1.82%)
Chest In drawing	4(3.64%)
Lethargy	4(3.64%)
Abdominal distension	4(3.64%)
Umbilical sepsis	1(0.91%)
Cyanosis	2(1.82%)
Grunting	2(1.82%)
Respiratory distress	27(24.55%)

**Table IV-** Exhibits various signs and symptoms of neonatal septicemic cases. Difficulty feeding was predominant (41.82%) followed by Breathing difficulty/Respiratory distress (24.55%), Fever (20.91%), cold, chest indrawing, lethargy, abdominal distension (3.64%), convulsions (2.73%), Diarrhea, vomiting, cyanosis, grunting (1.82%), discharge, umbilical sepsis (0.91%)

## DISCUSSION

Early diagnosis and treatment is crucial in deterrence of mortality and morbidity of neonatal septicemic cases. Although males have been reported to have higher likeliness to develop septicemia than females, the nearly 2.05:1 ratio of male to female neonates in this study is similar to khinchi Y.R *et al*<sup>2</sup> and Shehab El-din.E.M.R *et al*<sup>3</sup>. In present study, pre-term neonates were 26.36% and term were 73.64% this is in accordance with Shrestha.P *et al*<sup>4</sup>. Also, in current study, neonates with birth weight <1500g were 21.82%, 1500-2500g were 67.27% and >2500g were 10.91% which was in accordance to Shehab El-din *et al*<sup>5</sup>. Presentation of sepsis varies depending on severity of the disease process and immune status of the neonate. In the current study, Feeding difficulty, fever and respiratory distress were the common presentations.

An early diagnosis of neonatal septicemia is important to initiate proper treatment for favorable outcome. Out of 325 blood samples collected 110 were positive which is in accordance with Roy I *et al*<sup>6</sup>(47.5%) and Kayange.N *et al*<sup>7</sup>(38.9%). The range of organisms causing neonatal septicemia changes over time and varies from place to place even within the same hospital. Gram-negative organisms (64.49%) were predominant as compared to gram-positive organisms (35.51%) which is in accordance to Mustafa.Met *al*<sup>8</sup> and Samaga.M.P *et al*<sup>9</sup>. In present study, S.aureus was most usual gram-positive organism and among all isolates the second most common organism. Predominant organism among gram-negative isolate was Acinetobacter species (37.68%) followed by Klebsiella pneumoniae (28.98%) and E.coli(14.49%) which

is in accordance to Marwah.Pet *al*<sup>10</sup> and Mishra.A *et al*<sup>11</sup>. Low birth weight and prematurity have been mentioned to be significant risk factors for neonatal sepsis. In the current study, neonatal septicemic cases in males (67.27%) were reported more than females (32.73%) which is similar to Khinchi.Y.R *et al*<sup>12</sup> and Shehab El- din.E.M.R *et al*<sup>13</sup>. Presentation of sepsis varies depending on severity of the disease process and immune status of the neonate. In present study, preterm neonates were 26.36% and term neonates were 73.64% this is in accordance with Shrestha.P *et al*<sup>4</sup>. Also, in present study, neonates with birth weight <1500g were 21.82%, 1500-2500g were 67.27% and >2500g were 10.91% which was in accordance to Shehab El-din *et al*<sup>5</sup>. LBW babies are mostly premature and are susceptible to sepsis.

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