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RESEARCH ARTICLE

EARLY ONSET OF NEONATAL SEPSIS: ANALYSIS OF THE RISK FACTORS AND INCIDENCE OF BACTERIAL ISOLATES

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ABSTRACT

Background: Neonatal septicemia still signifies acritical cause of mortality and mortality among infants. Onset of septicemia in neonates within 72 hours of life constitutes EOS. Early onset sepsis is attained during fetal life, caused by organisms prevalent in the maternal genital tract, infecting the neonate transplacentally or during passage through a colonized birth canal at the time of delivery or at the nursery.

Methods: The present study was conducted in the department of Microbiology of Maharishi Markandeshwar institute of medical science and research, Mullana.

Result: A total of 93(84.55%) having EOS were studied. Male: female ratio was 2.03:1. Eleven (12.5%) were home delivery. Low birth weight (69.31%) and pre term (25%) were common risk factors while difficulty feeding (42.04%), febrile (21.59%) and breathing difficulty (20.45%) were common clinical presentations.

The common culture isolates were Klebsiella pneumoniae (21.59%), Staphylococcus aureus (21.59%) and Acinetobacter sp (19.31%).

Conclusions: The low birth weight and pre term neonates were at an escalating risk of developing EOS. Klebsiella and Staphylococcus aureus were common pathogens.

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INTRODUCTION

Early onset sepsis remains substantial contributor of neonatal mortality and morbidity.Neonates are susceptible to sepsis due to immature immune system, prematurity, low birth weight, respiratory problems and maternal infections. It is anticipated thatneonatal sepsis develop in 20% of the cases and approximately 1% death occurs due to sepsis related causes (Chelliah *et al*., 2014).

METHODS

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.

RESULTS

Among 325 suspected cases, blood culture positivity rate was found to be 33.85%. Out of the positive cases (80%) of neonates were suffering from early onset septicemia. In EOS, Klebsiella spp and S. aureus werepredominant isolates.

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DISCUSSION

Septicemia in neonates is the widespread bacterial infection recognized in first four weeks of life by positive blood culture (Chandel *et al*., 2011). The common factors related with these infections are low birth weight, duration of time spent in hospital environment, invasive procedures, surgery and colonization by bacteria from hospital environment, a substantial section of these septicemic babies are those, who are born unattended outside the hospital in unclean environment. The present study revealed that amongst a total of 325 clinically suspected cases of neonatal septicemia blood cultures from 105(95.45%) Table were positive for bacterial isolates which is similar to A. Bhattacharjee *et al*. (2008). Out of 105 EOS cases hospital deliveries were more 77(87.5%) as compared to home deliveries 11 (12.5%) (Table 2). In current study, (Table 3) Klebsiella spp (21.59%) and S.aureus (21.59%) were predominantly isolated from EOS which is similar to Mane *et al*. (2010) LBW and prematurity have been mentioned to be significant risk factors for neonatal sepsis. In the (Table 4) current study, neonatal septicemic cases in males (67.04%) were reported more than females (32.95%) which is similar to Khinchi *et al*. (2010). Also, preterm neonates were (25%) and term were (75%) this is in accordance with Shrestha *et al*. (2009).

In present study, neonates with birth weight <1500g were 19.31%, 1500-2500g were 69.31% and >2500g were 11.36% which was in accordance to Shehab El-din *et al*. (2015). LBW babies are mostly premature and are susceptible to sepsis due to various reasons like immune ineffectiveness at various levels of defense and are exposed to invasive interventions etc. LBW is a strong risk factor.

Table 1. Rate of Culture positive cases in clinically suspected cases of neonatal septicemia

Total no. Clinically suspected neonatal septicemia cases	Total no. Of positivebacterial isolate cases
325	105(95.45%)

Table 1. Shows that out of total 325 cases of neonatal septicemia the culture positive cases of bacterial isolate were 105 hence theculture isolation rate was (95.45%).

Table 2. Distribution of cases of EOS

Culture positive cases	Early Onset Septicemia	
	88(80%)	
105	Hospital delivery 77(87.5%)	Home delivery 11(12.5%)

Table 2. illustrates that among culture positive neonates, 88 (80%) were having EOS.In EOS hospital deliveries were more (87.5%) in contrast to LOS where home deliveries were more.

Table 3. Distribution of isolates in Early onset septicemia (EOS)

ORGANISM	Number of isolates (N=88)
Klebsiella spp	19(21.59%)
S.aureus	19(21.59%)
Acinetobacter spp	18(20.45%)
CoNS	8(9.09%)
Ecoli spp	7(7.95%)
Enterococcus spp	7(7.95%)
Pseudomonas spp	5(5.68%)
Citrobacter spp	4(4.55%)
Enterobacter spp	2(2.27%)
Alcaligenes faecalis	1(1.14%)

Table 3. Depicts distribution of isolates in early onset septicemia. In EOS, Klebsiella spp (21.59%) and S. aureus (21.59%) were predominent followed by Acinetobacter spp (20.45%), CoNS 8(9.09%), E.coli spp 7(7.95%), Enterococcus spp 7(7.95%), Pseudomonas spp 5(5.68%), Citrobacter spp 4(4.55%), Enterobacter spp 2(2.27%), Alcaligens faecalis 1(1.14%).

Table 4. Patient's characteristics of Early onsetneonatal septicemia (n=88)

Gender	Male female	59(67.04%) 29(32.95%)
Gestation	Preterm	22(25%)
	Term	66(75%)
Birth weight (g)	Very low <1500	17(19.31%)
	Low 1500-2500	61(69.31%)
	>2500	10(11.36%)

Table 4. Exhibits demographic characteristics of early onset neonatal septicemic cases. Male cases 59(67.04%) were more than female cases 29(32.95%). Pre term cases were 22(25%), term cases were 66(75%). Birth weight of neonates less than 1500g were 17(19.31%), 1500-2500g were 61(69.31%), more than 2500g were 10(11.36%).

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