ORIGINAL RESEARCH PAPER

Community Medicine

KEY WORDS: Incidence, Demography, Neonatal Sepsis, NICU.

A STUDY OF INCIDENCE, DEMOGRAPHIC DISTRIBUTION AND THE COMMON PATHOGENS OF NEONATAL SEPSIS IN NICU:

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ABSTRACT

Detailed studies on the clinical manifestations and laboratory profile of neonatal septicaemia in rural India are uncommon.Good laboratory facilities,especially blood culture,are frequently unavailable in the rural heaithcare setting,resulting in the non-availability of relevant data on culture-proven neonatal sepsis4. Neonatal sepsis is a significant cause of morbidity and mortality. Appropriate clinical diagnosis and empirical antibacterial treatment in a given setting is crucial as pathogens of bacterial sepsis and antibiotic sensitivity pattern can considerably vary in different settings. As neonatal septicemia is life threatening emergency and delays in diagnosis and treatment may have immediate and longterm adverse consequences ,antibiotic surveillance is needed. A sincere attempt is made to understand the Incidence and Demographic distribution of Neonatal Sepsis in NICU.

Introduction:
Neonatal Sepsis is the most important cause of morbidity and Mortality in developing countries. Neonatal sepsis is diagnosed when Generalized systemic features are associated with pure growth of bacteria from one or more sites.[1]

In developing countries, neonatal mortality (death in the first 28days of life per 1000 live births) due to all causes is about 34 per 1000 live births, most of these deaths occur in the first week of life[2,3].

In developing countries sepsis is the commonest cause of mortality responsible for 30% to 50% of 5 million neonatal deaths every year[2].

It is important to remember that bacterial flora is dynamic, different from one place as compared to the other and it changes in the same place over a period of time. It is essential to closely monitor the bacterial flora of the NICU and the antibiotic sensitivity pattern of pathogens to evolve rational antibiotic policy ,which is most suitable and specific for a particular NICU.[1]

Detailed studies on the clinical manifestations and laboratory profile of neonatal septicaemia in rural India are uncommon. Good laboratory facilities,especially blood culture,are frequently unavailable in the rural heaithcare setting,resulting in the non-availability of relevant data on culture-proven neonatal sepsis[4]. Neonatal sepsis is a significant cause of morbidity and mortality.Appropriate clinical diagnosis and empirical antibacterial treatment in a given setting is crucial as pathogens of bacterial sepsis and antibiotic sensitivity pattern can considerably vary in different settings.As neonatal septicemia is life threatening emergency and delays in diagnosis and treatment may have immediate and longterm adverse consequences ,antibiotic surveillance is needed[8-13]. A sincere attempt is made to understand the Incidence and Demographic distribution of Neonatal Sepsis in NICU.

Aims and Objectives:
To understand the Incidence and Demographic distribution of Neonatal Sepsis in NICU.

Materials and Methods:
Design: It is an observational cross sectional study.
1. Source: Shridevi Institute of Medical Sciences and Research Hospital.

Period of Study: April 2016 to March 2017.

INCLUSION CRITERIA:
Neonates were included when at least three of the following risk factors were present[1]:

1. Febrile illness in the mother during or within two weeks of delivery (more than 38^0 C, oral temperature).
2. More than 3 vaginal examinations during labor.

EXCLUSION CRITERIA:
1. Neonates with lethal congenital anomalies

Results:
Out of 2992 NICU admissions in the study period from April 2012 to March 2013, 419(14%) cases were taken up for the study considering inclusion and exclusion criteria. Out of 419 cases, blood culture was positive in 197 (47.016%) cases.

Table no.1: SEX DISTRIBUTION AMONG CLINICAL AND BLOOD CULTURE POSITIVE SEPSIS

Sex	CLINICAL SEPSIS		BLOOD CULTURE POSITIVE SEPSIS	
Male	262		94	
Female	157	p-value	103	p-value
Total	419	0.001	197	0.42

Out of 419 cases of clinical sepsis 242(57.75%) were male neonates,177(42.24%) were female neonates. Male neonates with clinical sepsis were admitted more frequently than female neonates which is statistically significant. (p-value 0.01)

Among 197 cases of proven sepsis 104(52.79%) were male neonates and 93(47.2%) were females neonates. There was no sex difference in blood culture positive sepsis (p-value 0.42)

Table no. 2. BACTERIAL PROFILE IN PROVEN SEPSIS

ORGANISM	NO OF PATIENTS
Gram negative	86(43.65%)
Klebsiella	64(32.48%)
E.coli	11(5.58%)
Pseudomonas	6(3.04%)
Proteus	4(2.03%)
Serratio	1(0.5%)
Gram positive	99(50.25%)
Coagulasepositive Staphylococcus	50(25.38%)
CONS	41(20.81%)
Streptococcus pneumonia	8(4.06%)
Candida	12(6.09%)
Total	197

Discussion:
Among these 419 cases were suspected of septicemia and 197 cases were of proven septicemia. So, the incidence of clinical septicemia among the cases admitted in NICU, was 14%and the

incidence of proven septicemia was 6.58%.

According to NNPD (2002 - 2003) reports, the incidence varying from 0.1% to 4.5% from 18 hospitals across India [4]. The reported incidence of neonatal sepsis varies from 7.1 to 38 per 1000 live births[5].

SEX:

Among 419 cases of clinical sepsis 242(57,75%) were male neonates,177(42.24%) were female neonates,ratio being 1.3:1. .Male neonates were admitted with clinical sepsis more frequently than female neonates The ratio was similar in study done by **Muhammad Z et al (2010)[6]** .In the study done by **Waheed M et al(2003)** male to female ratio was 2.1:1.[7]

In developing countries, neonatal mortality (death in the first 28days of life per 1000 live births) due to all causes is about 34 per 1000 live births, most of these deaths occur in the first week of life[2,3].

In developing countries sepsis is the commonest cause of mortality responsible for 30% to 50% of 5 million neonatal deaths every year[2].

It is important to remember that bacterial flora is dynamic, different from one place as compared to the other and it changes in the same place over a period of time. It is essential to closely monitor the bacterial flora of the NICU and the antibiotic sensitivity pattern of pathogens to evolve rational antibiotic policy ,which is most suitable and specific for a particular NICU.[1]

Out of 419 clinical sepsis 197 (47.01%)were blood culture positive. Out of 197 organisms isolated in blood culture 99(50.25%)were gram positive , 86(43.65%)were gram negative and 12(6.09%) were fungal sepsis (candida).Gram positive and gram negative sepsis occurred in equal proportions in the present study.

Klebsiella (32.48%) was the most common organism in our study followed by coagulase positive Staphylococcus.(25.38%) and CONS(20.81%).Among gram positive organisms most common were Coagulase positive Staphylococcus (25.38%), CONS (20.81%) followed by Streptococcus pneumonia(4.06%).Among Gram negative neonatal sepsis most common are Klebsiella (32.48%), followed by E.coli(5.58%),Pseudomonas (3.04%), Proteus (2.03%) and Serratio.(0.5%).

In the study done by **Viswanathan R et al(2012)[14]**among 216 cases of clinical sepsis,100(46.3%) cases had blood culture positive,which was similar to our study.In their study gram negative infection were predominant(58/100 cases).Most common organism was Klebsiella followed by E.coli ,Enterobacter sp.

In the study done by **Shrestha S et al(2013)** blood culture yield by conventional method was 44.13%[7] ,which is similar to our study.Gram positive organisms were 39.36% in which Staphylococcus aureus most common followed by CONS.Gram negative organisms were 60.64%, amongst Klebsiella most common followed by pseudomonas.

In the present study 78.6% cases were EOS and 21.3% were LOS. EOS was common presentation of proven sepsis,Klebsiella(37.4%) was common organism causing EOS.Where as CONS (35.7%) was commonest in LOS .Similar observations were made by **Shrestha S et al(2013)[15]** in which 84.08% were culture proven early onset sepsis and 15.95% were late onset sepsis[7].

Conclusion:

Klebsiella (32.48%) was the most common organism in our study followed by Coagulase positive Staphylococcus(25.38%) and CONS(20.81%)

Conclusion:

So, the incidence of clinical septicemia among the cases admitted in NICU, was 14%and the incidence of proven septicemia was 6.58%.

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