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Clinical Profile and Risk factors in Neonatal Sepsis

Fareedul.H[1], Shamshad.K[2],Prakash.S[3]
[1,2,3]*Yenepoya Medical college,Yenepoya University,Deralakatte,Mangalore-575018,India*

Abstract : Objective : *The aim of the study was to find the correlation of clinical profile and risk factors of neonatal sepsis with culture proven cases.* ***Materials and Method:*** *The study was conducted on 50 neonates a time based prospective study. All consecutive neonates fulfilling the inclusion and exclusion criteria are subjected to sepsis screening.* ***Results:*** *Among risk factors PROM and fetal distress were statistically significant with a p value of 0.009 respectively. Among the clinical features 80% of the neonates with mottling and grunting were proven sepsis which was statistically significant with a p value of 0.015 respectively.****Conclution:*** *Neonatal sepsis is a common disease of newborn with non-specific symptomatology causing difficulty in the diagnosis. Early and prompt detection and appropriate treatment of neonatal sepsis can significantly reduce the morbidity and mortality*

Keywords: *Early-onset;neonate;Risk factors; clinical signs and symptoms*

I. INTRODUCTION

Neonatal sepsis is the most common causes for neonatal mortality and morbidity, due to the delivery and postnatal care given in unhealthy environment and low socioeconomic state leading to maternal infection and neonatal sepsis. Therefore it is essential that we diagnose early onset sepsis using clinical signs and symptoms and rapid diagnostic techniques. Early onset sepsis can manifest as asymptomatic bacteremia, generalized sepsis, pneumonia or meningitis. Clinical signs are apparent in the first few hours of life and can have non-specific initial presentations.[9] Even if there is one or two clinical signs and symptoms or if there is any maternal or neonatal risk factors is present even though the neonate may be asymptomatic sepsis screening is usually performed. Thus early suspicion and diagnosis of neonatal sepsis will help in early treatment with appropriate antibiotics which would reduce the morbidity and mortality in neonates. Septicemia is more common among infants whose mother had prolonged rupture of membrane which increases risk of contamination of amniotic fluid by organism from birth canal before delivery[8] The present study was carried out to identify risk factors and clinical profile of neonatal sepsis in the neonatal unit.

Aim of the study was to find the correlation of clinical profile and risk factors of neonatal sepsis with culture proven cases.

II. METHODS AND MATERIALS

The study was carried out in Neonatal intensive care unit of Yenepoya Medical College, Yenepoya University, Deralakatte, and Mangalore. It is a prospective hospital based clinical study, over a period of one year from January 2013 to December 2013. All consecutive neonates fulfilling the inclusion and exclusion criteria are subjected to sepsis screening like serum procalcitonin, CRP, total count, gastric aspirate, peripheral smear and blood culture before starting treatment with antibiotics. 50 Neonates with suspected sepsis within the study period.

Inclusion criteria

All neonates with risk factors and clinical features of sepsis

Major risk factors

- PROM>18hrs
- Maternal fever >38˚c within 15 days
- Foul smelling liquor
- Fetal distress

Minor risk factors

- Low birth weight < 1500gms
- Prematurity < 34 wks
- Birth asphyxia (APGAR <5)
- Maternal WBC > 15000
- Vaginal swab positive for GBS

Clinical signs and symptoms

- Sclerema
- Lethargy
- Apnea
- Hypotonia
- Poor cry
- Breathlessness
- Irritability
- Grunting
- Poor feeding
- Vomiting
- Loose stools
- Temperature instability
- Mottling

Exclusion criteria

- Newborn babies with gestational age < 28 wks
- Neonates with birth weight <1000gms
- Neonates with obvious malformation/congenital anomalies
- Outside born babies

Written and valid informed consent was taken from the parent of the subject included in the study and the disease process and importance of treatment was explained to them. The study design and proforma was approved by the institutional ethical committee. The patient declining to give consent were excluded in the study

A study proforma was designed and accordingly the study subject underwent detailed history, clinical examination and laboratory investigations. Maternal history was elicited and risk factors were noted in the proforma. Birth details were recorded as per babies' case sheet details. Birth weight was recorded using electronic weighing scale at birth. Clinical signs and symptoms were observed and documented by the treating doctor

Gestational assessment was done using modified Ballard's assessment scale. At the admission baby's vital signs were recorded followed by systemic clinical examination was done and findings were recorded in the proforma.

The data obtained from the study is entered in the master chart. Data was analyzed according to the statistical methods. Chi-square test has been used to study the significance of study parameters on categorical scale between groups.

III. ANALYSIS AND INTERPRETATION OF DATA"

The data was analyzed and interpreted by employing descriptive statistics. The statistical software namely SPSS 20.0, Stata 8.0, Med Calc 9.0.1 were used for the analysis of the data and Microsoft word and excel have been used to generate graph , table etc. Level of significance for the present study was taken as $P \leq 0.05$.

Table 1: Distribution based on diagnosis

DIAGNOSIS	FREQUENCY	PERCENT
PROVEN SEPSIS	16	32%
PROBABLE SEPSIS	34	68%

Table 2: Distribution of variables in relation to proven sepsis

VARIABLES		N=50	PROVEN SEPSIS	P VALUE
SEX	MALE	26(52%)	7(26.5%	0.200
	FEMALE	24(48%)	9(37.5%)	
GESTATION	PRETERM	20(40%)	9(45%)	0.108
	TERM	30(60%)	7(23%)	
TYPE OF DELIVERY	LSCS	16(32%)	4(25%)	0.204
	NVD	34(685)	12(35%)	
BIRTH WEIGHT	LOW BIRTH WEIGHT	22(44%)	10(45%)	0.157
	NORMAL	28(56%)	6(21%)	

Among the 50 neonates there was no statistical significance in comparison between sex, gestational age, type of delivery and birth weight in proven sepsis.

Table 3:Distributions of risk factors in relation to proven sepsis

RISK FACTORS	N-50	PROVEN SEPSIS	P VALIE
PROM	14(28%)	7(50%)	**0.009(hs)**
MATERNAL FEVER	9(18%)	5(55%)	0.094
FOUL SMELLING LIQUOR	12(24%)	5(41%)	0.410
FETAL DISTRESS	24(48%)	12(50%)	**0.009(hs)**
LOW BIRTH WEIGHT	22(44%)	10(45%)	0.071
PRE-MATURITY	20(40%)	9(37%0	.108
BIRTH ASPHYXIA	5(10%)	3(60%)	.157
MATERNAL WBC >15000	16(32%)	4(25%)	.467
MECONIUM STAINED LIQUOR	20(44%)	9(37%)	.108

Among the risk factors in our study group PROM had a significant p value of 0.009 and fetal distress had a p value of 0.009 which were statistically significant.

Table 4: Distribution of clinical features in relation to proven sepsis

CLINICAL FEATURES	N-50	PROVEN SEPSIS	P VALUE
SCLEREMA	7(14%)	2(28%)	0.834
LETHARGY	18(36%)	4(22%)	0.266
APNEA	6(12%)	3(50%)	0.314
HYPOTONIA	4(8%)	1(25%)	0.754
POOR CRY	10(20%)	3(30%)	0.880
POOR FEEDING	28(56%)	8(28%)	0.558
RESPIRATORY DISTRESS	24(48%)	5(20%)	0.104
GRUNTING	5(10%)	4(80%)	**0.015(hs)**
VOMITING	11(22%)	4(36%)	0.725
TEMPERATURE INSTABILITY	10(20%)	3(30%)	0.880
MOTTLING	5(10%)	4(80%)	**0.015(hs)**
IRRITABILITY	6(12%)	1(16%)	0.391

Among the Clinical features which were present in our study group grunting and mottling had a p value of 0.015 respectively which were statistically significant.

This hospital based prospective study has observed and confirmed some known facts.

Based on Gestational age, birth weight and sex distribution of the study group (n=50)

In this study, the age distributions was 42.8% of 21 preterm infants and 24.1% of 29 term infants had proven sepsis. Anderson –Berry et[3] al in their study in 2008 in Carolina USA observed that sepsis is more common in preterm neonates. The results of our study were almost comparable with Raghavan et al[2] and Tallur et al[1]

The higher proportion of term neonates compared to the preterm neonates in our study probably reflects difference in the population characteristics and the occurrence of the predisposing factors among them. Preterm are more susceptible to infection due to inherent defensive mechanism.

In this study male neonates with proven sepsis was 26.5% of the 26 and females neonates were 37.5% out of 24 were proven sepsis. IN the present study 40% neonates were with birth weight less than <2.5 kgs And our study showed 44% of 22 neonates with low birth were diagnosed with proven sepsis compared to 21.4% of 28 with normal birth weight were proven sepsis.

Anderson et al [3] also showed increased risk of neonatal sepsis with decrease in birth weight. Results in our study were almost comparable with Tallur et al [1]

Based on risk factors in the study group(n=50)

In our study 55% of the 9(18%) with maternal fever,50% of the 14(28%) with prom,50% 0f 24(48%) neonates with fetal distress,45%of 22(44%) neonates with low birth weight,45%of 20(40%) preterm,41%of the 12(24%) with foul smelling liquor,45% of 20(40%) had meconium stained liquor had proven sepsis and they were in significant in number.28% of the 7(10%) with birth asphyxia, 25% of the 16(32%) with maternal wbc >15000 were diagnosed with proven sepsis and were less in number comparatively. Among the risk factors

Prom and fetal distress were statistically significant with a p value of 0.009 respectively. The observation in our study is very similar to the Tallur et al[1]
In our study Prom was 50% which was higher compared to 26% in Kuruvilla et al[4]
Foul smelling liquor was 41% in which was more than that observed in various studies but had closer results when compared to Raghavan et al[2]
The variation in the occurrence of intrapartum risk factors probably reflects differences in the rates of occurrence of the predisposing risk factors in various other studies.

Based on clinical features in the study group(n-50)

In our study poor feeding was the most common complaint and was seen in 28 neonates and 28% of the 28 were diagnosed with proven sepsis. Respiratory distress was seen in 24 neonates and 20% of them were proven sepsis.
Other clinical features were lethargy was 18, vomiting was 11, poor cry 10, 10 had temperature instability 6 had apnea respectively which were not statistically significant 5 had mottling, grunting was seen in 5 .
Among the clinical features 80% of the neonates with mottling and grunting were proven sepsis which were statistically significant with a p value of 0.015 respectively, 50% of neonates with apnea and 36% of neonates with vomiting were proven sepsis.
Observation in our study were very close to various other studies.

IV. CONCLUSION

Among risk factors PROM and fetal distress were statistically significant with a p value of 0.009 respectively. Among the clinical features 80% of the neonates with mottling and grunting were proven sepsis which was statistically significant with a p value of 0.015 respectively. Blood culture is the gold standard for diagnosing neonatal sepsis but it requires 48-72 hours Neonatal sepsis is a common disease of newborn with non-specific symptomatology causing difficulty in the diagnosis. Early and prompt detection and appropriate treatment of neonatal sepsis can significantly reduce the morbidity and mortality.

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