IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 16, Issue 12 Ver. XI (Dec. 2017), PP 75-79
www.iosrjournals.org

Clinical Profile And Risk Factors in Neonatal Sepsis

*****Dr. Bhagyashri Bora[1], Dr. Swati Sonawane[2],
**Corresponding authorDr. Swati Sonawane*

Date of Submission: 11-12-2017 Date of acceptance: 28-12-2017

I. Introduction

Neonatal period is considered the most important age group at all times as newborn are most vulnerable to disease and death. Sepsis is the commonest cause of neonatal mortality. It is responsible for about 30-50% of total neonatal deaths in developing countries.[1,2] Neonatal sepsis can be classified into two subtypes depending upon whether the onset of symptoms is before 72 hours of life (early onset) or after 72 hours of life (late onset)[3].The neonate immune system is underdeveloped. An algorithmic approach utilizes sepsis screen for management of asymptomatic as well as symptomatic neonates with sepsis. Clinical symptomatology can be mild and non-specific. The definite diagnosis based on culture is not available for at least 2 days. Also, none of the tests alone have sufficient accuracy and reliability. So a combination of tests is used to diagnose probable sepsis. This combination is called "Sepsis Screen".[4]Thepresent 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 clinical profile and risk factors associated with neonatal sepsis.

II. Methodology

The study was carried out in Neonatal intensive care unit of Rural Medical College, Loni, Maharashta. It is a Descriptive cross sectional hospital based study, over a period of 2 years (1/7/2015 – 31/8/2017).The data for study is collected from subjects fulfilling inclusion criteria, neonates suffering from or suspected for neonatal septicemia and admitted as in patient in NICU at tertiary hospital, in rural Maharashtra. 300 neonates were studied during the study period.

2.1 Inclusion criteria

1. Babies delivered at this hospital and diagnosed to have neonatal septicemia- whether diagnosis is based on clinical features or investigations.

2.2 Major risk factors

1. PROM>18hrs
2. Maternal fever >38˚c within 15 days
3. Foul smelling liquor

2.3 Minor risk factors

1. Low birth weight < 1500gms
2. Prematurity < 34 wks
3. Birth asphyxia (APGAR <5)
4. Prolonged labour
5. Instrumental delivery
6. >3 intra-partum vaginal examinations

2.4 Clinical signs and symptoms

1. Temperature instability
2. Poor cry
3. Lethargy
4. Poor feeding
5. Vomiting
6. Irritability
7. Apnea
8. Convulsion
9. Hypotonia
10. Jaundice
11. Breathlessness,Respiratory Distress

12. Grunting
- Abdominal distension
- Hepatosplenomegaly
- Sclerema

2.4 Exclusion criteria were

1. All out-born neonates
2. Neonates with congenital anomalies
3. Neonates with respiratory distress syndrome
4. Neonates whose parents are not given consent.
5.

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. 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.

III. Statistical Methods

Data was entered into Microsoft excel data sheet and was analyzed using SPSS 22 version software. Categorical data was represented in the form of Frequencies and proportions. Continuous data was represented as mean and standard deviation. Z test of difference between two proportions was used to test the difference between two proportions. Association between variables was done by applying Chi-square test and p value < 0.05 was considered as statistically significant.

IV. Results

In present study, 300 inborn neonates having neonatal sepsis were studied, out of which 69 neonates had proven sepsis 239 neonates had probable sepsis. .The incidence of neonatal sepsis among sample among total live inborn neonates in study period was 17.28 per 1000 of live births.Among the studied neonates, sepsis was recognized as EOS 182(60.67%) in cases and as LOS in 118(39.33%)The basic data for newborns is shown in Table 1 and includes gestational age, birth weight, sex, mode of delivery,

Table 1: Distribution of variables in relation to neonatal sepsis:

Parameters	**Values**		
Sex	**EOS**	**LOS**	**Total**
Male	64.83%	66.95%	65.67%
Female	35.17%	33.05%	34.33%
Gestational age	**EOS**	**LOS**	**Total**
Term	21.97%	67.79%	40%
Preterm	78.03%	32.21%	60%
Birth weight	**EOS**	**LOS**	**Total**
Low birth weight	81.32%	67.80%	76%
Normal birth weight	18.68%	32.20%	24%
Mode of delivery	**EOS**	**LOS**	**Total**
LSCS	84.6%	67.79%	78%
Vaginal	15.38%	32.20%	22%

Table 2:Sepsis in EOS (≤72hrs.) and LOS (>72hrs.):

Sepsis	**EOS (≤72hrs.)**	**LOS (>72hrs.)**	**Total**
	No. of cases (%)	**No. of cases (%)**	
Proven	37(20.33%)	32(27.12%)	69(23%)
Probable	145(79.67%)	86(72.88%)	231(77%)
Total	**182**	**118**	**300**
Result	Value of Z = 16.26 p<0.001, significant	Value of Z = 17.07, p<0.001, significant	

Out of 300 neonates in the study Proven sepsis was in 23% neonates while 77% neonates had probable sepsis. By applying Z test of difference between two proportions the proportion of probable sepsis is significantly higher than in proven sepsis in both i.e. EOS and LOS group (p<0.001).

Table 3: Risk factors in EOS (≤72hrs.) and LOS (>72hrs.):

Risk factors	EOS (≤72hrs.) No. of cases (%)	LOS (>72hrs.) No. of cases(%)	Total	p value
PROM	72(39.56%)	1(0.85%)	40.41%	<0.001
Prolonged labour	10(5.49%)	20(16.95%)	22.44%	0.001
Instrumental delivery	24(13.19%)	12(10.17%)	23.36%	0.432
Foul smelling or meconium stained liquor	60(32.97%)	0	32.97%	<0.001
>3 intra-partum vaginal examinations	58(31.87%)	14(11.86%)	43.73%	<0.001
Febrile illness in mother	12(6.59%)	0	6.59%	0.004
No known risk factor	22(12.08%)	86(72.88%)	36%	<0.001

On evaluation of some risk factors it was found that-

PROM was present in 39.56% neonates having EOS compared to only 0.85% neonates developing LOS. The presence PROM risk factor in development in EOS was statistically highly significant (p<0.001). Presence of more than 3 intrapartum vaginal examinations was in 31.87% developing EOS and 11.86% in LOS. There was statistically highly significant (p<0.001) difference of predominance of EOS with >3 intrapartum vaginal examination.Positive predictive value of risk factors in association with neonatal sepsis is 87.8%Common clinical manifestation of neonatal septicemia were Jaundice in 56%, followed by Apnea in 40% , 35.66% having Lethargy or vomiting or hyperthermia

Clinical features	EOS (≤72hrs.) No. of cases (%)	LOS (>72hrs.) No. of cases(%)	Total
Refusal of feed	38(20.88%)	46(38.98%)	84(28%)
Lethargy	61(33.52%)	46(38.98%)	107(35.66%)
Vomiting	43(23.62%)	64(54.23%)	107(35.66%)
Hyperthermia	49(26.92%)	58(49.15%)	107(35.66%)
Hypothermia	53(29.12%)	12(10.17%)	65(21.66%)
Convulsion	27(14.83%)	8(6.78%)	35(11.67%)
Respiratory Distress	11(6.04%)	12(10.16%)	23(7.66%)
Apnea	86(47.25%)	34(28.81%)	120(40%)
Abdominal distension	22(12.09%)	38(23.72%)	60(20%)
Jaundice	122(67.03%)	46(38.98%)	168(56%)
Hepatomegaly	56(30.76%)	22(18.64%)	78(26%)
Splenomegaly	14(7.69%)	10(8.47%)	24(8%)
Sclerema	32(17.58%)	10(8.47%)	42(14%)
Prolonged CRT	42(23.33)	38(32.2%)	80(26.66%)

Table 4: Clinical features in EOS (≤72hrs.) and LOS (>72hrs.):

V. Discussion

In our study, among 300 neonates with neonatal sepsis, the incidence of EOS is 182(60.67%) significantly higher than LOS 118(39.33%).In present study;male: female ratio of 1.9:1 and is comparable with studies conducted by Chandra Madhur Sharma et al[5]andVinay BS[6] et alby showing higher incidence of septicemia in males. Also higher incidence of neonatal sepsis is seen in preterm and low birth weight babies in present study. Study by Eman M. RabieShehab El-Din[9] showed increased risk of neonatal sepsis with decrease in gestation age (preterm) and decrease in birth weight which is comparable with our study.

Table 5: Comparative studies showing the distribution of risk factors among neonatal sepsis:

Perinatal risk factors	Yanceyet al[7] (1996)	Royetal[8] (2002)	DestaalemGebremedhin et al[10] (2015)	VinayBS et al[6] (2015)	Present study (2017)
PROM	36.75%	28.9%	30.8%	25%	40.41%
Prolonged labour	29.9%	-	-	-	22.44%
Preterm	17%	32.8%	66.3%	68.4%	60%
LBW/VLBW	29.9%	63.8%	30.8%	70%	76%
Foul smelling or meconium stained liquor	49.57%	-	9%	8.3%	32.97%
>3 intrapartum vaginal	50.4%	-	32.1%	-	43.73%

examinations					
Febrile illness in mother	-	5.2%	28.2%	8.%	6.59%

Among the risk factors; >3 intrapartum vaginal In our study is comparable with study by Yancey et al[7] (1996). Risk factor, preterm (60%) in present study is comparable with study by DestaalemGebremedhinet al[10] (2015) and Vinay BS et al[6] (2015). Risk factor, PROM (40.41%) in our study is comparable with study by Yancey et al[7] (1996).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.

Table 6: Comparative studies showing the distribution of clinical features among neonatal sepsis**:**

Clinical Features	Khatua et al[11] (1986)	Sunaina et al[12] (2004)	A.S.M. NawshadUddin Ahmed[13](2002)	Fareedul.H et al[14] (2014)	UrvashiRana et al. [15] (2016)	Present study (2017)
Refusal of feed	92.3%	79.5%	26.7%	28%	77.84%	28%
Lethargy	74%	41.8%	40%	22%	68.80%	35.66%
Vomiting	-	-	16.7%	20%	39.94%	35.66%
Temperature abnormality	71.6%	54.2%	52.4%	30%	95.6%	57.32%
Convulsion	10.8%	32%	10%	-	44.89%	11.67%
Respiratory Distress	24%	71.5%	46.7%	36%	65.88%	7.66%
Apnea	13%	74.2%	20%	50%	29.73%	40%
Abdominal distension	60.1%	4.4%	20%	-	41.89%	20%
Jaundice	-	-	40%	-	33.81%	56%
Hepatosplenomegaly	-	-	-	-	6.91%	34%
Sclerema	17.4%	-	-	14%	34.98%	14%

1. . Temperature abnormality was the most common (57.32%) clinical feature, which is comparable with Khatuaet al[11] (1986), Sunainaet al[12] (2004), UrvashiRana et al. [15] (2016).
2. In our study, clinical feature, refusal to feed (28%) is comparable with Fareedul.Het al[14] (2014) but not with Sunainaet al[12] (2004), UrvashiRana et al. [15] (2016).
3. In our study, clinical feature, convulsion11.67% is comparable withwithKhatuaet al[11] (1986) but not with Sunainaet al[12] (2004), UrvashiRana et al. [15] (2016).
4. In our study, clinical feature, apnea40%, is comparable with Fareedul.Het al[14] (2014).
5. In our study, clinical feature, vomiting35.66% is comparable with
6. UrvashiRanaet al.[15] (2016).
7. In our study, clinical feature, respiratory distress7.66% is comparable with Khatuaet al[11] (1986).
8. In our study, clinical feature,sclerema14%is comparable with Khatuaet al[11] (1986) and Fareedul.H et al[14] (2014).
9. Observation in our study were very close to various other studies

VI. Conclusion

Incidence of early onset sepsis is higher in present study. In present study, among the maternal risk factors;>3 intrapartum vaginal examinations and PROM have higher incidence of neonatal sepsis while fetal risk factors like LBW/VLBW and Preterm have higher incidence of neonatal sepsis. Among the clinical features in present study, temperature abnormality, jaundice, lethargy and vomiting are most commonly associated with neonatal sepsis.Early and prompt detection and appropriate treatment of neonatal sepsis can significantly reduce the morbidity and mortality.

Bibliography

[1]. Bang A T, Band R A, Bactule S B, Reddy H M, Deshmukh. Effect of home based neonatal careand management of sepsis on neonatal mortality; field trial in rural India. Lancet. 1999; 354:p. 1955-61.
[2]. Stoll BJ. The global impact of neonatal infection. ClinPerinatol. 1997; 224:p. 1-21.
[3]. Singh M. care of Newborn. 7thed. New Delhi: Sagar publications; 2010.
[4]. Philip AG, Hewitt JR. Early diagnosis of neonatal sepsis. Pediatrics. 1980; 65: p. 1036-41.
[5]. Chandra Madhur Sharma, Ravi PrakashAgrawal, HariomSharan. "Neonatal Sepsis": Bacteria & their Susceptibility Pattern towards Antibiotics in Neonatal Intensive Care Unit. Journal of Clinical and Diagnostic Research. 2013 Nov, Vol-7(11): 2511-2513
[6]. Vinay BS, Girish GN, SripathiAdhikari, SiddalingappaHugara. Evaluation of Septic Screen as a Diagnostic Tool for Neonatal Sepsis in a Tertiary Hospital at Mysore. Sch. J. App. Med. Sci., 2015; 3(2G):1005-1010
[7]. Yancey MK, Patric D, Paul k, et al. Risk factors for neonatal sepsis. Obstet Gynecol. 1996;87: p. 188-94.
[8]. Roy I, Jain A, Kumar M, Agrawal SK. Bacteriology of neonatal septicemia in tertiary care hospital.

[9]. Eman M. RabieShehab El-Din, Mohamed M. Adel El-Sokkary and Mohamed RedaBassiouny. Epidemiology of Neonatal sepsis and Implicated Pathogens: A Study from Egypt. BioMed Research International. 2015.
[10]. DestaalemGebremedhin, HaftuBerhe, KahsuGebrekirstos. Risk Factors for Neonatal Sepsis in Public Hospitals of Mekelle City, North Ethiopia, 2015: Unmatched Case Control Study. PLOS ONE. 2016; DOI:10.1371/journal.pone.0154798
[11]. Khatua SP, Das AK, Chatterjee BD, Ghose B. Neonatal septicemia. Indian J. Pediatr. 1986; 53(4): p. 509-14
[12]. Sunaina, Garg R, Mittal NK. Clinico-bacteriological profile of neonatal septicemia in district level NICU. Journal Neonatology. 2004; 18(3): p. 43-8.
[13]. A.S.M. NawshadUddin Ahmed, M.A.K. Azad Chowdhury, MahbulHoque and Gary L. Darmstadt. Clinical and bacteriological profile of neonatal septicemia in tertiary level pediatric hospital in Bangladesh. Indian Pediatrics 2002; 39:1034-1039
[14]. Fareedul.H, Shamshad.K, Prakash.S. Clinical Profile and Risk factors in Neonatal Sepsis.IOSR Journal of Dental and Medical Sciences (IOSR-JDMS) olume 13, Issue 12 Ver. VI (Dec. 2014), PP 44-47.
[15]. UrvashiRana, CharulPurani, Kirti Gupta. Clinico-Bacteriological Profile of Neonatal Sepsis in a Tertiary Care Hospital.ARC Journal of Pediatrics Volume 2, Issue 2, 2016, PP 1-8.

*Dr. Bhagyashri Bora. "Clinical Profile and Risk Factors in Neonatal Sepsis." IOSR Journal of Dental and Medical Sciences (IOSR-JDMS) 16.12 (2017): 75-79