



## RETROSPECTIVE ASSESSMENT OF NEONATAL SEPSIS CASES IN GOVERNMENT HOSPITAL TIRUPUR

<sup>1</sup>Dr. R. Senthilselvi, M.Pharm. Ph.D, <sup>2\*</sup>Nidhin Mohan, <sup>3</sup>Dr. V. Ganesan, M.Pharm., Ph.D., <sup>4</sup>S. Rajarajan, M.Pharm and <sup>5</sup>Dr. J. Nandhakumar M.Pharm., Ph.D.

Department of Pharmacy Practice, the Erode College of Pharmacy and Research Institute.  
Perundurai Main Road Vallipurathanpalayam, Tamil Nadu. Erode 638112.

Article Received on  
23 May 2018,

Revised on 13 June 2018,  
Accepted on 03 July 2018

DOI: 10.20959/wjpps20188-12037

### \*Corresponding Author

**Nidhin Mohan**

Department of Pharmacy  
Practice, the Erode College  
of Pharmacy and Research  
Institute. Perundurai Main  
Road Vallipurathanpalayam,  
Tamil Nadu. Erode 638112.

### ABSTRACT

Neonatal sepsis is one of the major health problems throughout the world. Every year an estimated 30 million newborns acquire infection and 1-2 million of these die. The present review provides updates regarding neonatal sepsis to help paediatricians to protect the newborn from this deadly problem. The onset of sepsis within first 48 hours of life (early onset sepsis) is frequently associated with pre and perinatal predisposing factors while onset after 48-72 hours of life (late onset sepsis) frequently reflects infection acquired nosocomially. Some literatures say that early onset disease presents in the first 5-7 days of life. *Klebsiella pneumoniae* is the leading pathogen causing neonatal sepsis in Bangladesh and neighbouring countries. Among many risk factors the single most important neonatal risk factor is low birth

weight. Ampicillin and gentamicin are the first drug of choice. In Bangladesh context sepsis score may be used as a good parameter for the early and rapid diagnosis of sepsis and that will guide the treatment plan. Clean and safe delivery, early and exclusive breastfeeding, strict postnatal cleanliness following adequate handwashing and aseptic technique during invasive procedure might reduce the incidence of neonatal sepsis. Prompt use of antibiotic according to standard policy is warranted to save the newborn lives from septicaemia.

**KEYWORDS:** Neonatal sepsis, Retrospective assessment.

## INTRODUCTION

Neonatal infections currently cause about 1.6 million deaths annually in developing countries. Sepsis and meningitis are responsible for most of these deaths. Resistance to commonly used antibiotics is emerging and constitutes an important problem world wide.

Sepsis is the commonest cause of neonatal mortality; it is responsible for about 30-50% of the total neonatal deaths in developing countries. It is estimated that up to 20% of neonates develop sepsis and approximately 1% die of sepsis related causes. Sepsis related mortality is largely preventable with prevention of sepsis itself, timely recognition, rational antimicrobial therapy and aggressive supportive care.

Neonatal sepsis is a type of neonatal infection and specifically refers to the presence in a newborn baby of a bacterial blood stream infection (BSI) (such as meningitis, pneumonia, pyelonephritis, or gastroenteritis) in the setting of fever. Older textbooks may refer to neonatal sepsis as "sepsis neonatorum". Criteria with regards to hemodynamic compromise or respiratory failure are not useful clinically because these symptoms often do not arise in neonates until death is imminent and unpreventable. Neonatal sepsis is divided into two categories: early-onset sepsis (EOS) and late-onset sepsis (LOS). EOS refers to sepsis presenting in the first 7 days of life (although some refer to EOS as within the first 72 hours of life), with LOS referring to presentation of sepsis after 7 days (or 72 hours, depending on the system used). neonatal sepsis is the single most important cause of neonatal death in hospital as well as community in developing country.

It is difficult to clinically exclude sepsis in newborns less than 90 days old that have fever (defined as a temperature  $> 38^{\circ}\text{C}$  ( $100.4^{\circ}\text{F}$ )). Except in the case of obvious acute viral bronchiolitis, the current practice in newborns less than 30 days old is to perform a complete workup including complete blood count with differential, blood culture, urinalysis, urine culture, and cerebrospinal fluid (CSF) studies and CSF culture, admit the newborn to the hospital, and treat empirically for serious bacterial infection for at least 48 hours until cultures are demonstrated to show no growth. Attempts have been made to see whether it is possible to risk stratify newborns in order to decide if a newborn can be safely monitored at home without treatment despite having a fever. One such attempt is the Rochester criteria.

The newest definition of sepsis has recently been published. In 2016, the Third International Consensus Definitions Task Force (Sepsis-3) defined sepsis as "life-threatening organ

dysfunction due to a dysregulated host response to infection." The new criteria are based on just three symptoms.

- Altered mental status
- Fast respiratory rate ( $> 22$  breaths/minute)
- Low blood pressure ( $\leq 100$  mm Hg systolic)

According to National Neonatal Forum of India sepsis has defined as follows:

**Probable (Clinical) Sepsis:** In an infant having clinical picture suggestive of septicaemia, if there is the presence of any one of the following criteria:

- Existence of predisposing factors: maternal fever or foul smelling liquor or prolonged rupture of membranes ( $>24$  hrs) or gastric polymorphs ( $>5$  per high power field).
- Positive septic screen - presence of two of the four parameters namely, TLC ( $< 5000/\text{mm}$ ), band to total polymorph nuclear cells ratio of  $>0.2$ , absolute neutrophil count  $< 1800/\text{cumm}$ , C-reactive protein (CRP)  $>1\text{mg/dl}$  and micro ESR  $> 10$  mm-first hour.
- Radiological evidence of pneumonia.

## MATERIALS AND METHODS

**Study site:** The study is conducted in Government district headquarters hospital, Thirupur district, Tamil Nadu.

**Study period:** September 2017 - February 2018

**Study type:** Retrospective study

**Sample size:** 80 patients

**Study population:** Babies attended in neonatal intensive care unit and case sheets from medical record department.

### Inclusion criteria

- New babies diagnosed with neonatal sepsis
- Patients those willing to give their consent.

### Exclusion criteria

- Babies with age over 4 weeks
- Adults

### Study procedure

The present study was conducted at Government district headquarters hospital, Thirupur for the retrospective assessment of Neonatal sepsis cases. The study involves mainly 3 steps.

#### 1-Collection of the prescriptions

The prescriptions were collected from the Neonatal intensive care unit and medical record department of Government district headquarters hospital, Thirupur. For a period of 6 months that is from Sep 2017 to Feb 2018.

The study was conducted in retrospective manner, The data was collected from the respective departments of the hospital on proforma.

#### 2-Analysing the prescription

The Collected data from the prescriptions were entered in to proforma were analyzed. The pattern of drug use and duration of therapy, mostly prescribed drugs are noted and other important parameters are noted.

#### 3-Statistical analysis

The data was collected according to the proforma and was entered in separate excel sheets in respective of their proformas or the parameters and they were analysed for the outcomes of the individual parameters like gender, age groups, others by making a table first and then followed by a graphical representation of the data.

The study was designed in a Retrospective manner. It was conducted in patients admitted in the Neonatal intensive care unit of Government district headquarters hospital, Thirupur district (Tamilnadu) from September 2017-February 2018.

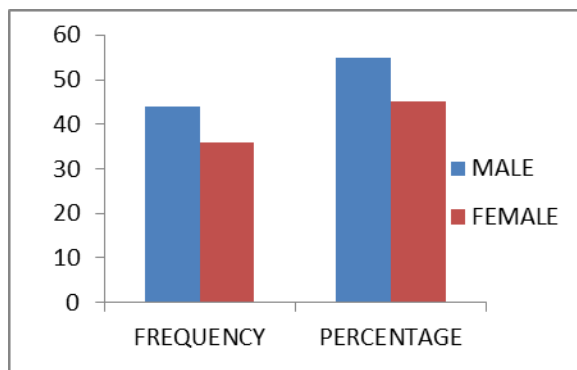
A study population of 80 patients (all below 4 weeks and diagnosed with Neonatal sepsis) was selected.

## RESULTS

### Sex Wise Distribution of Neonatal Sepsis

Table 1

SEX	FREQUENCY n=80	PERCENTAGE %
MALE	44	55
FEMALE	36	45

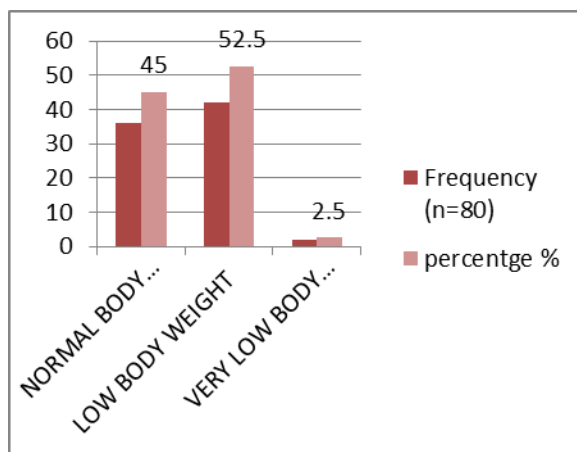


80 Patients were selected for the retrospective study. The study population consisted of 44 Males (55%) and 36 Females (45%) FIGURE 1.

**Body Weight Distribution of Neonatal Sepsis Cases**

**Table 2**

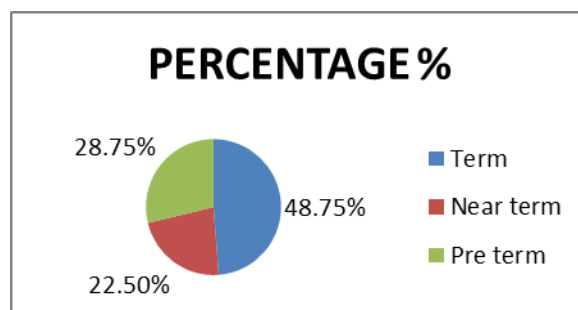
<b>BODY WEIGHT (kg)</b>	<b>FREQUENCY (n=80)</b>	<b>PERCENTAGE %</b>
NORMAL BODY WEIGHT	36	45
LOW BODY WEIGHT	42	52.5
VERY LOW BODY WEIGHT	2	2.5



Patients selected for the study had different body weight distributions. Most of the patients affected had low body weight (52.5%) and then followed by neonates with normal body weight (45%) and neonates with very low body weight (2.5%). FIGURE 2.

**Distribution of Gestational Age of Neonatal Sepsis****Table 3**

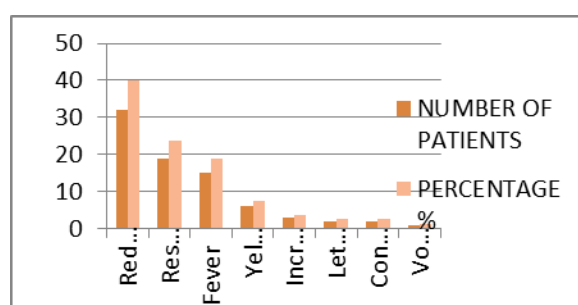
<b>GESTATIONAL AGE (WEEKS)</b>	<b>FREQUENCY (n)</b>	<b>PERCENTAGE %</b>
Term	39	48.75
Near term	18	22.50
Pre-term	23	28.75



Maximum number of patients fall on the gestational age group of more than 37 weeks (term) (48.75%). In both males and females maximum number of patients were from this age group. Minimum number of patients were from the age group of 35 to 37 weeks (Near term) (22.5%) and (28.75%) Patients with gestational age of less than 35 weeks (Pre term) were affected with neo natal sepsis. This indicates that incidence of Neonatal sepsis increases with gestational age. FIGURE 3.

**Prevalence of Symptoms in Neonatal Sepsis Patients****Table 4**

<b>SYMPTOMS</b>	<b>NUMBER OF PATIENTS</b>	<b>PERCENTAGE %</b>
Reduced sucking	32	40
Respiratory distress	19	23.75
Fever	15	18.75
Yellowish discolouration	6	7.5
Increased irritability	3	3.75
Lethargy	2	2.5
Convulsions	2	2.5
Vomiting	1	1.25

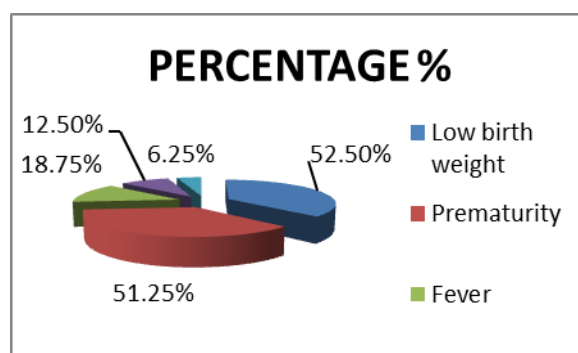


The most common symptom associated with neonatal sepsis was found to be 'Reduced sucking' (40%) followed by 'Respiratory distress' (23.75%) and then followed by 'Fever' (18.75%) and 'Yellowish discoloration' (7.5%). Some other symptoms such as 'vomiting' (1.25%) and 'convulsions' (2.5%) and 'Lethargy' (2.5%) and 'Increased irritability' (3.75%) were found to be minimum. FIGURE 4.

### Prevalence of Risk Factors In Neonatal Sepsis Patients

**Table 5**

RISK FACTORS	NUMBER OF PATIENTS (n)	PERCENTAGE %
Low birth weight	42	52.5%
Prematurity	41	51.25%
Fever	15	18.75%
Asphyxia	10	12.5%
Meconium aspiration	5	6.25%

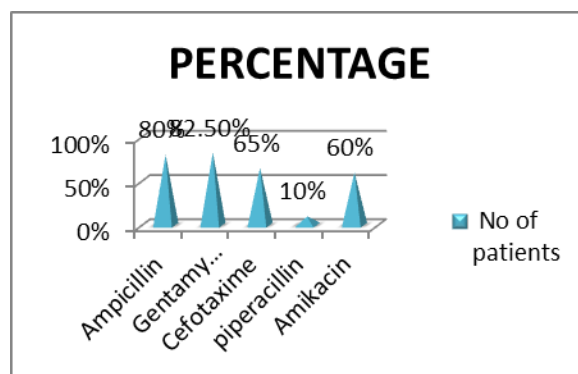


The most common risk factors associated with Neonatal sepsis was found to be 'Low birth weight' (52.5%) and prematurity (51.25%). Both risk factors were found in more than half of the study population. FIGURE 5

### Drug Pattern in Treatment of Neonatal Sepsis

**Table 6**

MEDICATION	NO OF PATIENTS	PERCENTAGE %
Ampicillin	64	80
Gentamycin	66	82.5
Cefotaxime	52	65
piperacillin	8	10
Amikacin	48	60



- Ampicillin and Gentamycin were the most commonly used antibiotic medication. Gentamycin was used in 66 patients (82.5%) and Ampicillin was used in 64 patients (80%). Cefotaxime was used in 52 patients (65%) and amikacin was used in 48 patients and piperacillin was used in 8 patients(10%) out of 80. FIGURE 6.

## DISCUSSION

- Neonatal sepsis was found to be more prevalent in males rather than female patients. This indicates that male gender is an important risk factor for Neonatal sepsis.
- Prevalence of Neonatal sepsis found to be increasing in patients with low birth weight comparing to those patients having normal birth weight.
- Neonatal sepsis was found to be more prevalent in neonates of gestational age group more than 38 weeks. This reflects that gestational age is an important risk factor for Neonatal sepsis.
- Most common symptom associated with neonatal sepsis was found to be Reduced sucking, about 40% of population had Reduced sucking.
- Some other symptoms like Respiratory distress and Fever was also found to be the common symptoms of Neonatal sepsis.
- The most common risk factors associated with Neonatal sepsis were found to be low birth weight and prematurity. These two risk factors were found in more than half of the population. Chances for neonatal sepsis was found to be increasing with these risk factors. All the population had multiple risk factors.
- The drug pattern included was antibiotics along with vitamin k injection in some cases.
- Most preferred treatment was antibiotics. Ampicillin and Gentamycin were the most commonly used antibiotics. These two are generally used as the first line treatment of Neonatal sepsis. Combination therapy was preferred more than treatment with individual drugs.



- The present study demonstrates high prevalence of Neonatal sepsis risk factors in the population. The incidence of Neonatal sepsis is likely to increase further so there is need to conduct awareness programmes regarding the disease.
- Many newborns receive prolonged antibiotic therapies without considering the adverse effects and also it may result in antibiotic resistance. So we need to develop guidelines to manage individuals with neonatal sepsis.

### ACKNOWLEDGEMENTS

This work was supported by my respected guide prof Dr.R.Senthilselvi M.Pharm ph.D professor department of pharmacy practice the erode collage of pharmacy for giving her valuable suggestions guidance and constant encouragement throughout the project work.

### REFERENCES

1. Bang AT, Bang RA, Bactule SB, Reddy HM, Deshmukh MD. Effect of home-based neonatal care and management of sepsis on neonatal mortality: field trial in rural India. *Lancet*, 1999; 354: 1955-61.
2. Stoll BJ. The global impact of neonatal infection. *Clin Perinatol*, 1997; 24: 1-21.
3. Klinger G, Levy I, Sirota L, Boyko V, Reichman B, et al. (2009) Epidemiology and risk factors for early onset sepsis among very-low-birthweight infants. *Am J Obstet Gynecol*, 201: 38.
4. Kaftan H, Kinney JS. Early onset neonatal bacterial infections. *Semin Perinatol*, 1998; 22: 15-24.
5. Lever A, Mackenzie I. Sepsis: definition, epidemiology, and diagnosis. *BMJ*, 2007; 335: 879-83.
6. Singh M, Narang A, Bhakoo ON. Predictive perinatal score in the diagnosis of neonatal sepsis. *J Trop Pediatr.*, 1994 Dec.; 40(6): 365-8.
7. Takkar VP, Bhakoo ON, Narang A. Scoring system for the prediction of early neonatal infections. *Indian Pediatr.*, 1974; 11: 597-600.
8. Bizzarro MJ, Raskind C, Baltimore RS, Gallagher PG (2005) Seventy-five years of neonatal sepsis at Yale: 1928-2003. *Pediatrics*, 116: 595-602.
9. Vergnano S, Menson E, Kennea N, Embleton N, Russell AB, et al. (2011).
10. Neonatal infections in England: the NeonIN surveillance network. *Arch Dis Child Fetal Neonatal Ed*, 96: F9-F14.