

*Original Article-Medical Education***Neonatal sepsis in a General Sudanese Teaching Hospital, Sudan**

Elsadig Yousif Mohamed<sup>1</sup>, Sami Eldirdiri<sup>2</sup>, Humida Ali Gurashi<sup>3</sup>, Mohamed Ahmed A/Gadir Eliman<sup>4</sup>, Sawsan M. Abdalla<sup>1</sup>, Abdalla Ali Khamis<sup>5</sup>

<sup>1</sup>Department of Community Medicine, College of Medicine, Majmaah University, Saudi Arabia

<sup>2</sup>Department of General Surgery, Faculty of Medicine, Gedarif University

<sup>3</sup>Department of Community Medicine, Faculty of Medicine, Gedarif University, Sudan

<sup>4</sup>Department of Obstetrics and Gynaecology, Faculty of Medicine, The National Ribat University, Khartoum, Sudan.

<sup>5</sup>Department of Pediatrics and Child Health, Faculty of Medicine, The National Ribat University, Khartoum, Sudan.

**ARTICLE INFO:****Article history:**

Received: 20 January, 2015

Received in revised form:

10 February, 2015

Accepted: 18 February, 2015

Available online: 28 February, 2015

**Keywords:**

Neonatal sepsis

Sudanese Hospital

**ABSTRACT**

**Background:**The objectives of the study were to determine the causes, clinical presentation, management and outcome of neonatal sepsis in Gadarif Teaching Hospital, Sudan. **Methods:**The study was descriptive conducted in the department of neonatology in Gedarif Teaching Hospital, Sudan. All the 240 records of patients attended the hospital during 2008-2010, and diagnosed as neonatal sepsis were considered in the study. Data were collected by a check list and analyzes by the computer using SPSS version 16. **Results:**The causes of neonatal sepsis were low birth weight, pre mature rupture of the membrane, mother infection and menengeocele constituted 39.6%, 31.3%, 20.8% and 2.5% respectively, other causes constituted 5.8%. Most of the patients were presented with poor sucking (59.2%). Other presentations were fever, pallor, respiratory distress, vomiting, diarrhea, and jaundice constituted 43.8%, 43.8%, 39.6%, 35.4%, 27.1%, and 27.1% respectively. Other causes constituted 16.3%. Death ratio for neonatal sepsis was 12.5%. **Conclusion:**The study concluded that neonatal sepsis is more common among males. Neonatal sepsis is related to Low birth weight, pre mature rupture of the membrane, mother infection before delivery and menengeocele. Most of the patients with neonatal sepsis present with poor sucking, fever, pallor and respiratory distress. Death ratio from neonatal sepsis is 12.5%.

**1. Introduction**

Neonatal sepsis is a serious blood bacterial infection in an infant less than 4 weeks of age. In developing countries, neonatal sepsis remains to be a major cause of mortality and morbidity in spite of recent advances in technology and therapeutics. Some factors influencing sepsis in newborns are immature immune system, decreased phagocytes in the white cell population, decreased cytokine production and weak humoral immunity[1,2,3]. The global incidence of neonatal sepsis is estimated at 5-6/1000 live births, 6-21/1000 live births in sub-Saharan Africa, 1.8-12/1000 live births in the Middle East and North Africa[4,5].

Globally, severe infections constitute 26% of neonatal mortality [6]. It is estimated that infection contributes to approximately 30%–40% of the deaths of the 5 million neonates who die every year in low-income countries[7]. The World Health Organization estimates that one million deaths per year is due to

neonatal sepsis and 42% of these deaths occurs in the first week of life[8]. Neonatal sepsis may be categorized as early or late onset. Eighty-five percent of newborns with early-onset infection present within 24 hours and onset is most rapid in premature neonates. Early onset sepsis syndrome is associated with acquisition of microorganisms from the mother. The incidence of neonatal sepsis is affected by socioeconomic status such as gender (males are four times more affected than females), income, race as long as the standard of neonatal care received[9]. The objectives of the study were to determine the causes, clinical presentation, management and outcome of neonatal sepsis in Gadarif Teaching Hospital, Sudan.

**2. Patients and methods**

The study was descriptive conducted in the department of

neonatology in Gedarif Teaching Hospital, Sudan. Gedarif State is located in the southern east part of the Sudan. The service area is 72000 square kilometers and the population size is about 1384000 [10]. Gedarif Teaching Hospital is the main state hospital providing services for population from the capital and the localities as long as teaching medical students of Gedarif University. There are five specialists working in the pediatrics department one of whom is a neonatologist [11].

All the 240 records of patients attended the hospital during 2008-2010, and diagnosed as neonatal sepsis were considered in the study. Data were collected by a check list and analyzed by the computer using SPSS version 16.

### 3. Results

**Table 1:** Age and sex of neonates with sepsis

Social factors	No.	%
Age		
Less than 7 days	90	37.5%
7-13	70	29.1%
14-20	40	16.7%
21-28	40	16.7%
Total	240	100
Sex		
Male	137	57%
Female	103	43%
Total	240	100%

**Table 3:** Clinical presentation of neonatal sepsis

Presentation	No.	%
Poor sucking	145	59.2%
Fever	105	43.8%
Pallor	105	43.8%
Respiratory distress	95	39.6%
Vomiting	85	35.4%
Diarrhea	65	27.1%
Jaundice	65	27.1%
Other	39	16.3%

### 4. Discussion

According to this study, Most of the patients were presented in the first and second weeks of age (37.5% and 29.1%). According to sex, results showed that male sex is predominating [9,7,12]. Clinical signs and symptoms of neonatal sepsis can vary depending on the gestational age of the infant as well as the underlying pathogen. Septic shock in the term infant Neonatal sepsis is associated with low birth weight and prematurity [12]. According to this study, death ratio from

Results showed that most of the patients were less than seven days of age (37%), 7-13 days, 14-20 days, and 21-28 days constituted 29.1%, 16.7% and 16.7% respectively. Most of the patients were males (57%) as shown in table 1. Table 2 showed that the causes of neonatal sepsis were Low birth weight, premature rupture of the membrane, mother infection and meningeocele constituted 39.6%, 31.3%, 20.8% and 2.5% respectively, other causes constituted 5.8%. Results showed that most of the patients were presented with poor sucking (59.2%). Other patients presented with fever, pallor, respiratory distress, vomiting, diarrhea, and jaundice constituted 43.8%, 43.8%, 39.6%, 35.4%, 27.1%, and 27.1% respectively. Other causes constituted 16.3%. As regards the outcome of neonatal sepsis, 64.6% were discharged in good health, 10.4% were discharged by their parents, and 12.5% were referred for more medical consultation. Death ratio was 12.5% as in table 4.

**Table 2:** Causes of neonatal sepsis

Cause	No.	%
Low birth weight	95	39.6%
Pre mature rupture of the membrane	75	31.3%
Mother infection before delivery	50	20.8%
Meningeocele	6	2.5%
Others	14	5.8%

**n=240**

**Table 4:** Outcome of neonatal sepsis

Outcome	No.	%
Discharged in good health	155	64.6%
Discharged against medical advice	25	10.4%
Referred	30	12.5%
Died	30	12.5%
Total	240	100%

should be suspected if there is respiratory distress and reduced perfusion, particularly if the history is positive for chorioamnionitis, prolonged rupture of membranes, maternal fever or fetal tachycardia during labor and/or known GBS colonization with inadequate intrapartum chemoprophylaxis. According to our results, most of the patients with neonatal sepsis were presented with poor sucking and fever [7,13].

neonatal sepsis was 12.5% [14]. These findings were higher than results from Indonesia where the mortality from neonatal sepsis

was 28.3%[15]. In neonates with low birth weight the mortality rate is higher[16].

### Conclusion

The study concluded that neonatal sepsis is more common in males. The disease is associated with low birth weight, premature rupture of the membrane, mother infection before delivery and meningocele. Most of the patients with neonatal sepsis present with poor sucking, fever, pallor and respiratory distress. Death ratio from neonatal sepsis is 12.5%.

### References

- [1]. Trotman H., Bell Y., Thame M., Nicholson AM., Barton M., Predictor of poor outcome in neonates with bacterial sepsis admitted to the University Hospital of the West Indies, *West Indian Medical Journal* 2006; 55:80-84.
- [2]. Ringer SA., Care of the extreme low birth weight infants. In: Cloherty JP., Eichenwald EC., Stark AR., editors, *Manual of neonatal care*. 6th ed. Philadelphia: Lippincott, William and Wilkins; 2008: 78-85.
- [3]. Shah GC., Budharhoki S., Das BK., Mandal RN., Risk factors in early neonatal sepsis. *Kathmandu University Medical Journal* 2006 ;4:187-91
- [4]. Janjindamai W., Petpisa S., Time to positivity on blood culture in new born infants, *South east Asian Journal of Tropical Medicine and Public Health* 2006; 37: 171-5.
- [5]. Stoll B., Neonatal infection: A global perspectives, In: Remington J., Klein J., editors, *Infectious diseases of the foetus and newborn*, Philadelphia: WB Saunders; 2000:139-68.
- [6]. Lawn JE., Cousens S., Zupan J., 4 million neonatal deaths: When? Where, why? *The Lancet* 2005; 17: 9-18.
- [7]. Mathai E *et al.* Is C-reactive protein level useful in differentiating infected from uninfected neonates among those at risk of infection, *Indian pediatrics* 2004; 41:9:895–900.
- [8]. Bryce J., Boschi-Pinto C., Shibuya K., Black RE., WHO Child Health Epidemiology Reference Group, WHO estimates of the causes of death in children, *The Lancet* 2005; 365: 1147–52.
- [9]. Klein JO., Remington JS., Current concepts of infections of the fetus and newborn infant. In: Remington J., Klein J., editors, *Infectious diseases of the fetus and newborn*, Philadelphia: WB Saunders; 2000: 1-24.
- [10]. Government of Sudan, Central Bureau of Statistics, Sudan 5<sup>th</sup> census 2008.
- [11]. Ministry of Health, Gadarif State, Department of Statistics, Annual report 2010.
- [12]. Soman M, Green B and Daling J., Risk factors for early neonatal sepsis, *American Journal of Epidemiology*, (1985). 121:5: 712-719.
- [13]. Taeusch H.W., Ballard R.A and C.A.m Gleason, *Avery's Diseases of the Newborn*, 8<sup>th</sup> ed., Philadelphia: Elsevier Saunders 2005.
- [14]. Stoll B.J., Hansen N.I., Higgins R.D. *et al.*, Very low Birth weight preterm infants with early onset neonatal sepsis: The predominance of Gram-negative infections continues in the National Institute of Child Health and Human Development Neonatal Research Network 2002–2003, *The Pediatric Infectious Disease Journal* 2005;24: 635–639.
- [15]. Kardana IM., Incidence and factors associated with mortality of neonatal sepsis, *Paediatrica Indonesiana* 2011; 51:3:144-148.
- [16]. Utomo MT., Neonatal sepsis in low birth weight infants in Dr. Soetomo General hospital, *Indonesian Journal of tropical and infectious disease* 2010;1:2: 86-9.

***Source of support: Nil, Conflict of interest: None Declared***