

# Neonatal Sepsis and Associated Factors of New Born Child in Pokhara Academy of Health Sciences, Pokhara, Nepal

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**Abstract:** Neonatal sepsis is one of the serious problems in medicine and is a major cause of mortality in developing countries like Nepal. Neonatal Sepsis is caused by certain bacteria that are harmful to the human body and health. A study was carried out in Department of Pediatrics, Pokhara Academy of Health Sciences from 2018 to 2019. Out of total neonates checked in hospital, neonates who suffered from sepsis as well as risk factors associated with sepsis development were taken for the study. It was found that neonatal sepsis in Pokhara was still high. Among different risk factors six factors namely low birth weight, bleeding disorder during the pregnancy, prolonged labor, maternal history of uterine infection, Maternal fever and Education level of mother were associated with major risk factors on neonatal sepsis.

**Keywords:** sepsis, neonates, maternal

## 1. Background

Neonatal sepsis is defined as systemic inflammatory response syndrome in the presence of or as a result of suspected or proven infection in a neonate<sup>(1)</sup>. Neonatal sepsis is a major cause of morbidity and mortality in newborns. The term “neonatal sepsis” used broadly in the clinical context encompasses diagnosis of septicemia, meningitis, pneumonia, arthritis, osteomyelitis and urinary tract infection in newborns<sup>(2)</sup>. Neonatal sepsis is one of the commonest causes of neonatal mortality in the developing world. About 99% of the approximate 1 million annual neonatal deaths from life threatening invasive bacterial infections occur in developing countries<sup>(3)</sup>. Neonatal sepsis may be classified according to the time of onset of the disease: early onset sepsis and late onset sepsis. Early onset neonatal sepsis usually presents within the first 72 hours of life and Late onset sepsis usually present after 72 hours of age<sup>(3)</sup>. The risk factors include lack of antenatal care, unsupervised or poorly supervised home deliveries, unhygienic and unsafe delivery practices and cord care, prematurity, low birth weight, lack of exclusive breast feeding, birth asphyxia, resuscitation during birth and delay in recognition of danger signs in both mother and baby<sup>(2)</sup>. It is important to know the etiology, various risk factors associated with neonatal infections in Nepal to develop effective treatment strategies and to reduce neonatal mortality. Awareness of risk factors associated with neonatal sepsis prepares clinician for early detection and effective treatment, thereby reducing mortality and morbidity. The present study is carried out to determine the risk factors associated with neonatal sepsis of new born admitted in special newborn care unit of western regional hospital.

## 2. Materials and Methods

A retrospective study was carried out analyzing all the cases recorded of Neonatal Sepsis in Department of Pediatrics, Pokhara Academy of Health Sciences, Pokhara from 2018 to

2019. Ethical permission was taken from institutional board of review. The neonates who presented with the signs and symptoms of septicemia, with or without pneumonia and meningitis were studied in retrospect and a detailed record of the gestational age, sex birth weight, symptoms and signs along with maternal risk factors was made. Consent was taken from parents of neonates. Septic screening was done routinely with complete blood count, C- reactive protein, micro ESR and blood culture .other investigations were done as required. The management of cases was according to the written standard protocols in the unit.

## 3. Results

### Neonatal risk factor associated with neonatal sepsis

Neonatal risk factors associated with neonatal sepsis is presented on Table (1). Out of total newborns admitted with suspected neonatal sepsis during the study period; (60.6%) were male and (39.4%) were female. out of total male neonates (70.22%) had confirmed neonatal sepsis while (60.22%) of total female had confirmed neonatal sepsis. In this study (59.1%) neonate were less than 7 days old, among whom (72.22%) had confirmed neonatal sepsis. Mode of delivery were spontaneous vaginal delivery in (74.7%), out of them 62.4% confirmed showed neonatal sepsis. Most of the admitted cases were for more than 2.5kg (74.7%), least were less than 1.5kg. However neonatal sepsis was found high on less birth weight. Home delivery was found more risk for neonatal sepsis as compared to hospital.

**Table 1:** Neonatal risk factor associated with neonatal sepsis

Factors	Charecteristics	Admitted in hospital showing symptoms of sepsis (%)	Culture showing sepsis (%)
Sex	Male	60.6	70.22
	female	39.4	60.22
Age	< 7days	59.1	72.22
	7–28 days	40.9	40.6
Mode of	Spontaneous vaginal	74.7	62.4

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delivery	delivery		
	cesarean section	25.3	58.6
Birth Weight	<1500gm	9.1	70.6
	1500–2500gm	16.2	44.2
	>2500gm	74.7	22.4
Delivery place	Home	24.77	65.37
	Hospital	75.23	25.26

#### Maternal risk factor associated with neonatal sepsis

Table 2 indicates maternal risk factor associated with neonatal sepsis. In this study, neonatal sepsis was ranked first on having low birth rate. Second was ranked to bleeding disorder during pregnancy followed by high labor duration. However, education level of mother did not marked as serious risk factors as others for neonatal sepsis.

**Table 2:** Major risk factors

Major risk factors	Ranking value
Low birth rate	i
Bleeding disorder during pregnancy	ii
High labor duration	iii
Maternal history of uterine infection	iv
Maternal fever	v
Low education level of mother	vi

#### 4. Discussion

Sepsis is the commonest cause of neonatal mortality and morbidity. Sepsis related mortality is largely either preventable or treatable with rational antimicrobial and supportive therapy. In this study, male neonates were more affected with neonatal sepsis than female. This is in concordance with study done by Jain NK et al<sup>(4)</sup>. This may be because of female produces the more active of cellular and humoral immune reaction so that they are more resistant to the infection<sup>(5)</sup>. In this study early onset neonatal sepsis was higher percentage than late onset neonatal sepsis. Similarly Author found early onset neonatal sepsis was more than late onset neonatal sepsis<sup>(6)</sup>. Early onset neonatal sepsis in general is more common because of various high risk perinatal factors for sepsis operate during this period<sup>(6)</sup>. In this study very low birth weight(<1.5kg) had confirmed high rate on neonatal sepsis than more birth weight. This is in concordance with other studies where low birth weight was found to be important risk factor for sepsis<sup>(6)</sup>. Low birth weight are mostly also premature and are predisposed to sepsis due to multiple reasons like immune incompetence at various levels of defense, more subjected to invasive interventions etc<sup>(6)</sup>. Prolonged labor more had more risk of neonatal sepsis as compared to labor less than 24hrs. prolonged labor has been one of the risk factors for early onset neonatal sepsis<sup>(7)</sup>. In our study neonatal sepsis was more frequent in deliveries occurring in home than institution. This is supported by study done by Khinchi et al<sup>(6)</sup>. This is because of institutional deliveries are conducted with preventive aspects with adequate perinatal care whereas in home deliveries there may be various predisposing and risk factors including unsafe or unclean environment, limited skilled manpower and inadequate facilities. This sort of findings associated on risk on neonatal sepsis were supported by the various studies.<sup>(8-10)</sup>

#### 5. Conclusion

The study was conducted in Department of Pediatrics, Pokhara Academy of Health Sciences. It was found that neonatal sepsis in Pokhara was still high. Among various risk factors; low birth rate, bleeding disorder during the pregnancy were marked as major risk factors. However education level of mother was not found as major factors for neonatal sepsis.

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