

Original research article

High Risk New Born: A Hospital Based Prospective Study

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Abstract

Objectives: This study was to evaluate the clinical profile and various prenatal risk factors of high risk new born in tertiary care centre.

Methods: A total of 100 subjects (sick neonate) with age of 1 hour to 71 hours who admitted to the neonatal intensive care unit (NICU) of Paediatric ward of NC Medical were included for this study. New born babies were admitted in NICU for fifteen days. Antibiotics and other therapy were used as on requirement of treatment of babies condition in NICU.

Results: Majorities of neonates were males (59%). Most of the babies (94%) were born in hospital. majorities of mothers (48%) were in age greater than 30 years. 34 % mothers age were less than 20 years. Average weight of male and female babies were 2124 grams and 1923 grams respectively. 55% had premature rupture of membrane (PROM). 38% babies were born in poor hygiene. 44% new born babies had hypothermia. 64%) new born babies were lethargic at the time of admission in NICU. 35% new born babies had slug reflex. 38% neonates were distress. 26% new born babies were in shock. And 5 % neonates were expired during the intervention in NICU. 95% neonates were survived and satisfactory discharge from NICU.

Conclusions: Neonatal sepsis is more preponderance in males than females. Maternal age, premature rupture of membrane (PROM), poor hygiene are the major prenatal causes of sepsis in neonates. Low birth weight, lethargy or refusal to feed, hypothermia, distress, sluggish reflex, shock are the common features of neonatal sepsis/high risk new born. So that, we should organise health checkup camp in urban and rural area for the awareness of pregnancy, prenatal care and high risk new born. And also needed for the early diagnosis and prompt treatment of neonatal sepsis to reduce the mortality of neonates.

Key words: High risk new born, prenatal causes, low birth weight

Introduction

Neonatal septicemia is defined as a clinical laboratory syndrome caused by the passage of pathogens, their toxins, or their antigens into the blood circulation during the first 72 hours of life [1].

Incidence of neonatal septicemia is 1.6% of all live births in developing countries [2]. Early and late neonatal septicemia is the most common problem in the newborn stage that caused high morbidity and mortality rate. It is responsible for (30-50)% of neonatal deaths in developing countries, according to WHO estimates [3].

It is highly prevalent in sub Saharan Africa, south Asia, and Latin America with case fatality risk of 9.8% in the first month of life [4]. Septicemia, meningitis, pneumonia, arthritis, osteomyelitis, and urinary tract infections are some of the prior causes of sepsis [5,6].

There are many risk factors for early neonatal sepsis as maternal factors (urinary and genital infections, prenatal fever, prenatal laboratory septicemia, multiple pregnancies, frequent vaginal examinations, premature rupture of membranes more than 18 hours), neonatal factors (prematurity, low birth weight, perinatal asphyxia, low Apgar scores, intrauterine infection), environmental factors (use of resuscitation tools, medical and nursing staff) [7]. White blood cells (WBC), neutrophil count, C-reactive protein (CRP), and platelet count (PLT) are the laboratory criteria for early neonatal sepsis. Blood culture is the gold standard in diagnosis [8].

The normal fetus is sterile until shortly before birth as the placenta and amniotic sac are highly effective barriers to infections. At birth, the newborn loses the protection afforded to it in the uterus and gets exposed to the microbial world [9]. Bacterial organisms causing NS may differ among countries, however, in most developing countries, Gram-negative bacteria remain the major source of infection [10]. In addition, bacterial organisms causing NS have developed increased drug resistance to commonly used antibiotics, making its management a challenge for both the public and private health sectors [11]. The most common pathogens found in early onset of neonatal sepsis (EONS) are Group B Streptococcus (50%) and Escherichia coli (20%). Other primary pathogens include Listeria monocytogenes, Enterococcus, and other Gramnegative bacilli (e.g., Haemophilus influenzae, Klebsiella pneumoniae) [12,13]. Objectives of our study was to evaluate the clinical profile and various risk factors of high risk new born in tertiary care centre.

MATERIAL & METHODS

This present study was conducted in the Department of Paediatric, NC Medical college, Israna, Panipat during a period from September 2021 to August 2022. Attendant of entire subject signed an informed consent approved by institutional ethical committee of NC Medical college.

A total of 100 subjects (sick neonate) with age of 1 hour to 71 hours who admitted to the neonatal intensive care unit (NICU) of Paediatric ward of NC Medical were included for this study. New born babies were admitted in NICU for fifteen days. Antibiotics and other therapy were used as on requirement of treatment of baby's condition in NICU.

Sampling techniques:

The total 100 sick neonates were recruited using a systematic random sampling technique, considering the number of sick neonates admitted to NICU per day.

Inclusion criteria:

Neonates admitted to NICU during the study period.

Exclusion criteria:

Exclusion criteria were Neonates with early discharge, neonates with incomplete patient chart information, and Neonates expired without taking any treatment on arrival.

Study variable:

The main study variables were baby conditions include age, sex, birth weight (BW), preterm and full term, poor hygiene, lethargy, hypothermia, slug reflex, distress, shock, hypoglycemia, death and mother condition includes maternal fever, foul liquid, vaginal examination, untrained person examination.

STATISTICAL ANALYSIS

Data was analysed by using simple statistical methods with the help of MS-Office software. All data was tabulated and percentages were calculated.

RESULTS

A total of 100 neonates were enrolled in this study. Majorities of neonates were males (59%). Most of the babies (94%) were born in hospital. And 06% babies were born in home.

Table.1. Showing the gender and places of delivery.

Variables	No. of neonates	Percentage
Male	59	59%
Female	41	41%
Home delivery	06	06%
Hospital delivery	94	94%

In this study, average weight of male and female babies were 2124 grams and 1923 grams respectively during the admission NICU.

Table.2. Showing the weight of neonates.

Variables	Weight	Average birth weight
Male	1050-3500 grams	2124 grams
Female	950-3400 grams	1923 grams

In this study, majorities of mothers (48%) were in age greater than 30 years. 34 % mothers age were less than 20 years. 18% mothers age were in between 20-30 years. 24% mother of babies were more than 3 times of vaginal examinations. 8% mothers had fever. 7% mother had foul liquor (rupture of amniotic sac). 55% had premature rapture of membrane (PROM). 15% mothers were examined by untrained person. 38% babies were born in poor hygiene. 44% new born babies had hypothermia. 64%) new born babies were lethargic at the time of admission in NICU. 35% new born babies had slug reflex. 38% neonates were distress. 26% new born babies were in shock.

12% neonates had hypoglycaemia at the of admission in NICU. And 5 % neonates were expired during the intervention in NICU. Out of 100 sick babies, 95% neonates were survived and satisfactory discharge from NICU.

Table.3. Showing the clinical outcome of neonates

Clinical outcome	No. of neonates	Percentage
Maternal age < 20 years	34	34%
Maternal age > 30 years	48	48%
Maternal age 20-30 years	18	18%
>3vaginal examination	24	24%

maternal fever	8	8%
foul liquor(amniotic fluid)	7	7%
PROM	52	52%
untrained person	15	15%
poor hygiene	38	38%
Hypothermia	44	44%
Lethargy	64	64%
Sluggish reflex	35	35%
Distress	38	38%
Hypoglycemia	12	12%
Shock	26	26%
Death	5	5%
Satisfactory discharge	95	95%

DISCUSSIONS

Neonatal sepsis is a clinical syndrome characterized by signs and symptoms of infection with or without accompanying bacteremia in the first month of life [14]. In the present study, 100 sick neonates were enrolled. Among them percentage of the male sex as a risk factor for early neonatal sepsis was 59%, while in both the Gianoni and Getabelew studies in Ethiopia it was 52% and 58.1%, respectively, where the male sex is associated with 3.7 times higher risk of early neonatal sepsis than the feminine sex, the mechanism is not fully defined and is not clear. It is likely to be multifactorial with genetic, immunological, and hormonal influences. There are related factors such as genes linked to the X chromosome in the female immune system [15,16,17].

Similar study was done by Mamta Jajoo, Kapil Kapoor, et al. and found that Incidence of early onset sepsis varies in out born neonates and many factors affect it like place of delivery, perinatal risk factors, and immediate practices done in newborn [16]. In the present study, all the 100 sick neonates were in age between 1 hour to 71 hours. Average birth weight during admission in NICU, male was 2124 grams, and female was 1923 grams.

In the present study, maternal age (above 30 years) and (less than 20 years) is considered a risk factor for early neonatal sepsis. The percentage of mothers over 30 years of age was the majority of patients with early neonatal sepsis (48%) and this is close to most international studies such as the Ethiopian study in 2019 and Dar's study Salam, who confirmed that newborns of mothers over 30 years of age are more prone to early neonatal sepsis [18,19].

Hassan's study in Bangladesh showed that the incidence of early neonatal sepsis increases in the newborns of mothers less than 20 years of age (67%) compared to our study, where it found that the rate is 34%. This could be due to the difference in the sample size and the social situation in Bangladesh, which dictates that females marry at an early age [20,21]. Maternal age less than 20 years is associated with a higher colonization rate of the vaginal wall with GBS(Group B Streptococcus), which explains the higher possibility of early neonatal sepsis, while age greater than 35 years is associated with the occurrence of serious medical complications associated with pregnancy such as gestational hypertension, diabetes, cardiovascular disease, congenital malformations and chromosomal problems, multiple pregnancies, prematurity, low birth weight and the need for cesarean section [2, 21].

Mate Siakwa studies in Ghana and Giannini in Switzerland. Birth weights are most likely to receive intravenous fluids and medications, as well as a lack of IgG immunoglobulins in

premature infants, are transmitted to the fetus from the mother through the placenta primarily during the third trimester of pregnancy [18, 22, 23].

In the present study, patient's mother was associated with features during birth of baby, maternal fever was 8 %, foul liquor (rupture of amniotic sac release amniotic fluid) 7%, premature rupture of membrane (PROM) was 52%, more than three times of vaginal examination was 24 % mothers, examination performed by untrained person was 15% of mother, and birth of baby in poor hygiene was 38%. Baby associated with features after birth, lethargy was 64% of babies, hypothermia was 44% of babies, sluggish reflex was 35%, distress was 38%, shock was 26%, hypoglycaemia was 12%. 5% babies were expired. And 95 % babies were satisfactory discharge from NICU.

Minyahil Alebachew Woldu¹, Molla Belay Guta, et al. also studied on neonatal sepsis and stated that most common risk factors were identified and place of delivery, mode of delivery and mother with UTI during delivery were the most common risk factors for the incidence of neonatal sepsis [24]. Our study was shown that most of the babies' mother was associated with premature rupture of membrane (52 %). Our findings were close to the study of Asia Jabiri in Tanzania (49.5%), whereby premature rupture of membranes may increase the risk of fetal exposure to pathogens in an ascending way [25]. In the present study, most of babies were associated with lethargy/refusal to feed (64%). Thus, prenatal risk factors are greatly associated with neonatal sepsis, which causes septicaemia in neonates.

CONCLUSIONS:

This present study concluded that the neonatal sepsis is more preponderance in males than females. Maternal age, premature rupture of membrane (PROM), poor hygiene are the major prenatal causes of sepsis in neonates. Low birth weight, lethargy or refusal to feed, hypothermia, distress, sluggish reflex, shock are the common features of neonatal sepsis/high risk new born. So that, we should organise health check up camp in urban and rural area for the awareness of pregnancy, prenatal care and high risk new born. And also needed for the early diagnosis and prompt treatment of neonatal sepsis to reduce the mortality of neonates.

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