



An Observational Study of High Risk New Born: A Hospital Based Study

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ABSTRACT

Aim: To evaluate the clinical outcome of high risk new born babies in NICU.

Methodology: complete assessment taken to all sick new born during admission in NICU and observe the clinical outcome.

Results: Data was analyzed by the MS Office software.

Conclusions: Mortality and morbidity of neonatal sepsis are high and associated with poor hygiene, low birth weight, and maternal health.

Key words: high risk new born, neonatal sepsis.

Introduction

International pediatric consensus conference of 2001, neonatal sepsis (NS) is defined as systemic inflammatory response syndrome in the presence of or as a result of suspected or proven infection in a neonate.^[1] 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.^[2] Bacterial organisms causing NS may differ among countries, however, in most developing countries, Gram-negative bacteria remain the major source of infection.^[3] 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.^[4]

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 Gram-negative bacilli (e.g., *Haemophilus influenzae*, *Klebsiella pneumoniae*).^[5,6] In developed countries, bacterial infections in neonates are commonly due to *E. coli*, other enterobacteriaceae, *L. monocytogenes*, and coagulase negative staphylococci (CONS) and Group B *Streptococcus*.⁷ Late-onset (LONS) sepsis (sepsis presenting after 5-7 days postnatal age) usually is caused by these primary organisms or by nosocomial pathogens, such as CONS,

particularly *Staphylococcus epidermidis*, *Staphylococcus aureus*, *Pseudomonas* species, *Anaerobes*, and *Candida* species.^[5]

Neonatal sepsis is broadly categorized into early and late, early onset infections acquired during the process of birth and presenting in the first 48 to 72 hours.^[12] The common pathogens are Group B streptococci and *Escherichia coli*. Presenting symptoms of early onset infection are often non-specific such as: Unstable temperature, Floppiness, Respiratory distress, Poor feeding, Apnea, Tachycardia, Seizures, and Jaundice.^[12]

The incidence of NS varies from 6 to 9 cases per 1000 live births, but is higher among low-birth-weight (LBW) neonates.⁵ Bacterial sepsis is considered to be an important cause of neonatal mortality.⁸ The World Health Organization estimated that there are approximately five million neonatal deaths per year of which 98% occur in developing countries.^[9] The number of children dying from sepsis in the world has almost doubled in the past 20 years.^[10] This may be due to the fact that antimicrobial therapy in most developing countries is mainly empirical due to the relative lack of appropriate laboratory facilities for culture and sensitivity of bacteria in several health facilities.^[11] Furthermore, surviving infants can have significant neurological sequelae as a consequence of central nervous system involvement, septic shock or hypoxemia secondary to severe parenchymal lung disease.^[12] The present study was to evaluate the clinical outcome of sick neonates in Neonatal intensive care unit (NICU) of hospital.

Method and Materials

Study Design

A prospective cross-sectional study was conducted. A total of 132 subjects (sick neonate) with age of 1 hour to 71 hours who admitted to the neonatal intensive care unit (NICU) of Pediatric ward of Bachcha Hospital Katihar, were taken for 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.

The attendant of entire subject signed an informed consent approved by institutional ethical committee of Katihar Medical College, Katihar, Bihar, India was sought. Data were collected in NICU of Bachcha Hospital, Katihar, Bihar, India, during period of November 2013 to May 2015.

Sample size and sampling techniques

A total of 132 sick neonates were recruited using a systematic random sampling technique, considering the number of sick neonates admitted to Bachcha hospital, NICU per day.

Inclusion criteria

All neonates admitted to Bachcha Hospital, 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 analyzed by using MS office software. Frequency and percentage of variables were calculated for analysis of data.

Results

A prospective cross-sectional study was carried over for a 18 months (November 2013 – May 2015) in Neonatal Intensive Care Unit (NICU) of Bachcha Hospital, Katihar, with an aim to evaluate the clinical outcome of sick neonates. A total of 132 (88 male and 44 female) subjects with age 1 hour to 71 hours were included.

Table.1. shows the sex, home and institutional delivery.

Variables	Frequency	percentage
Male	87	65.90
Female	45	34.09
Home delivery	24	18.18
Institutional delivery	108	81.81

Table 1 show the male was 87 (65.90%). And female was 45 (34.09%). 24(18.18%) babies were born in home and 108 (81.81 %) were born in hospital/institutions.

Table.2. shows the frequency and weight during admission in NICU.

Variables	Weight	Average birth weight
Male	1100-3400 grams	2219 grams
Female	900-3100 grams	2087 grams

(Table 2) weight of male new born was 1100 -3400 grams and female new born 900-3100 grams was taken during admission of sick neonates in NICU of hospital.

(Table 3) 8 (6.06%) mother was fever. 9 (6.81%) mother was foul liquor (rupture of amniotic sac). 63 (47.72%) was premature rapture of membrane (PROM). 35 (26.51%) were more than three times vaginal examination. 22(16.66%) mother was examined by untrained person. 53 (40.15%) babies were born in poor hygiene. 88 (66.66%) new born babies were lethargic at the time of admission in NICU. 60 (45.45%) new born babies

were hypothermic, 50 (37.87%) new born babies were slug reflex, 52 (39.39%) were distress, 37 (28.03%) new born babies were in shock, 19 (14.39%) neonates were hypoglycemia at the of admission in NICU. And 13 (9.84 %) neonates were expired during the intervention in NICU. Out of 132 sick babies, 119 (90.15 %) neonates were survived and discharge from NICU with satisfactory.

Table.3. shows the frequency and percentage of clinical outcome

Outcome	frequency	Percentage
maternal fever	8	6.06
foul liquor(amniotic fluid)	9	6.81
PROM	63	47.72
>3vaginal examination	35	26.51
untrained person	22	16.66
poor hygiene	53	40.15
Lethargy	88	66.66
Hypothermia	60	45.45
sluggish reflex	50	37.87
Distress	52	39.39
Shock	37	28.03
Hypoglycemia	19	14.39
Death	13	9.84
Satisfactory discharge	119	90.15

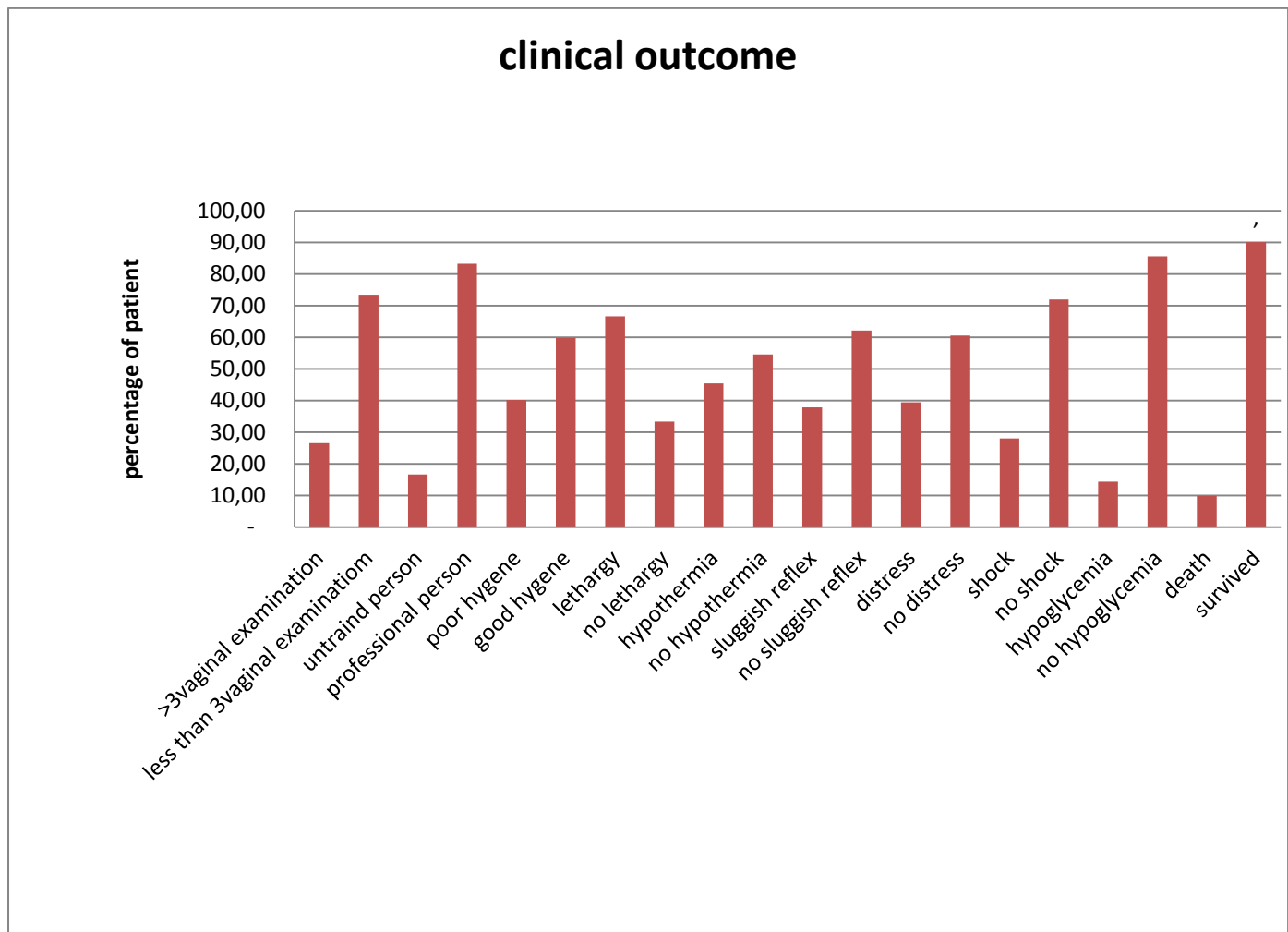


Figure.1. clinical outcome of patients in NICU

Discussion

This study was done in NICU of Bachcha Hospital, Katihar, Bihar, India. Similar study was done by Mamta Jajoo, Kapil kapoor, et al (2015), 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. [13]

Neonatal sepsis is a clinical syndrome characterized by signs and symptoms of infection with or without accompanying bacteremia in the first month of life. [12] Our study was included the 132 sick neonates with age group of 1 hour to 71 hours, male were 87 and female were 45. Average birth weight during admission in NICU, male was 2219 grams, and female was 2087 grams. Patient's mother was associated with features during birth of baby, maternal fever was

6.06 %, foul liquor (rupture of amniotic sac release amniotic fluid) 6.81 %, premature rupture of membrane (PROM) was 47.72%, more than three times of vaginal examination was 26.51 % mothers, examination performed by untrained person was 16.66 % of mother, and birth of baby in poor hygiene was 40.15 %. Baby associated with features after birth, lethargy was 66.66 % of baby, hypothermia was 45.45 % of baby, sluggish reflex was 37.87 %, distress was 39.39 %, shock was 28.03 %, hypoglycemia was 14.39 %, death was 9.84 %, and 90.15 % baby was satisfactory discharge from NICU. Minyahil Alebachew Woldu¹, Molla Belay Guta, et al (2014), 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. [1]

Our study was shown that most of the babies' mother was associated with premature rupture of membrane (47.72 %). And most of babies were associated with lethargy/refusal to feed.

In developing countries, general neonatal sepsis remains an important cause of neonatal septicemia. ^[15] The present study suggests prenatal risk factors were well-associated with mortality, and 13 (9.84%) cases were expired and 119 (90.15%) patients were satisfactory discharge from NICU.

Future Research

Science is dynamic and there is always a scope of improvement and change in time to come ahead. With progressive aim to move ahead we aspire to achieve highly accurate and reliable results. Thus every study leaves back scopes for other researcher to do something more advanced and varied in order to touch the height of perfection. This study examined only 132 subjects (87 male and 45 female), future researchers can expand the study by including more number of subjects so as to make generalization of the results and practice, further studies with a larger sample size and in multiple centers are required. Thus it could be applied to real life situation.

Relevance to clinical practice

This study is relevant to the high incidence of neonatal sepsis. It opens up new possibilities of prevention of sepsis and makes maintain the good health of mother and baby. Such knowledge in future would not only reduce morbidity but also have significant medical benefits on the health care systems

Limitation

There were several limitations like, the sample size was small, and it was a hospital-based study, the prevalence of exposure and outcome variables may be different from a community setting.

Conclusion

Early onset sepsis varies in new born and many factors affect it like mother's health status and health checkup, place of delivery, perinatal risk factors, and immediate treatment done in newborn. Mortality and morbidity of neonatal sepsis are high and associated with low birth weight, poor hygiene. In developing countries awareness, management and prevention of neonatal sepsis are needed, so that will reduce the morbidity and mortality of sepsis.

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