ORIGINAL RESEARCH

Assessment of neonatal outcome of the patients admitted in NICU

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ABSTRACT
Background: Neonatal period is the most vulnerable period of life due to different diseases, especially in preterm and low birth weight babies. The present study was conducted to assess neonatal outcome of the patients admitted in NICU. **Materials & Methods:**140 neonates of both genders were included and parameters such as mode of delivery, birth weight, gestational age, inborn or outborn delivery, indication for admission, bacteriological profile, investigations such as C-reactive protein (CRP), complete blood count (CBC), positive blood culture and cerebrospinal fluid (CSF) examinationand outcome after hospitalization in NICU was recorded. **Results:** Out of 140 patients, males were 80 and females were 60. Etiology of NICU admission was sepsis in 30, respiratory distress in 54, birth asphyxia in 16, hypoglycemia in 8, neonatal hyperbilirubinemia in 20, cardiac anomaly in 7 and congenital anomaly in 5 cases. The difference was significant (P< 0.05). Gestational age was <34weeks in 64, 34–36.6weeks in 46 and >37weeks in 30. Birth weight was 1500grams in 75, 1500-2500grams in 42 and>2500grams in 23. Mode of delivery was vaginal in 58 and caesarean in 82. The difference was significant (P< 0.05). **Conclusion:** The most common indication forNICU admission was sepsis, respiratory distress, birth asphyxia, hypoglycemia, neonatal hyperbilirubinemia, cardiac anomalyand congenital anomaly.
Key words: Neonatal, low birth weights, NICU

INTRODUCTION
Approximately four million neonates die in the first 4 weeks of life.Neonatal period is the most vulnerable period of life due to different diseases, especially in preterm and low birth weight babies.[1] Among these approximately 98% deaths occur in developing countries and are caused by infections, asphyxia, complications ofprematurity and low birth weights.[2] Neonatal mortality accounts for nearly two-thirds of infant mortality rate and one-third of under-five mortalities worldwide. Within the first month, one quarter to one-half of all the death occur within first 24 hour of life and 75% occur in the first week.[3]
Improving the quality of neonatal care provided at facility level is one way to decrease neonatal mortality. Quality improvement of neonatal care service can be achieved by improving the skills and knowledge of health care provider in addition to availing them with the equipment and resources required for quality care.[4]

Studies have shown that neonatal deaths are responsible for the majority of mortalities in children under the age of 5 years with a reported rate of 35% in the USA and up to 50% in certain low-income countries.[5] The 2030 agenda for sustainable development by WHO calls for reduction in neonatal mortality rate to less than 12 per 1000 live births.[6]The present study was conducted to assess neonatal outcome of the patients admitted in NICU.

MATERIALS & METHODS
The present study comprised of 140 neonates of bothgenders. Parental written consent was obtained before enrolling neonates in the study.
Data such as name, age, gender etc. was recorded. Parameters such as mode of delivery, birth weight, gestational age, inborn or outborn delivery, indication for admission, bacteriological profile, investigations such as C-reactive protein (CRP), complete blood count (CBC), positive blood culture and cerebrospinal

fluid (CSF) examinationand outcome after hospitalization in NICU was recorded. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table I: Distribution of patients

| Total-140		
Gender	Males	Females
Number	80	60

Table I shows that out of 140 patients, males were 80 and females were 60.

Table II: Etiology of ICU admission

Etiology	Number	P value
Sepsis	30	0.01
Respiratory distress	54	
Birth asphyxia	16	
Hypoglycemia	8	
Neonatal hyperbilirubinemia	20	
Cardiac anomaly	7	
Congenital anomaly	5	

Table II, graph I shows that etiology of NICU admission was sepsis in 30, respiratory distress in 54, birth asphyxia in 16, hypoglycemia in 8, neonatal hyperbilirubinemia in 20, cardiac anomaly in 7 and congenital anomaly in 5 cases. The difference was significant (P< 0.05).

Graph I: Etiology of ICU admission
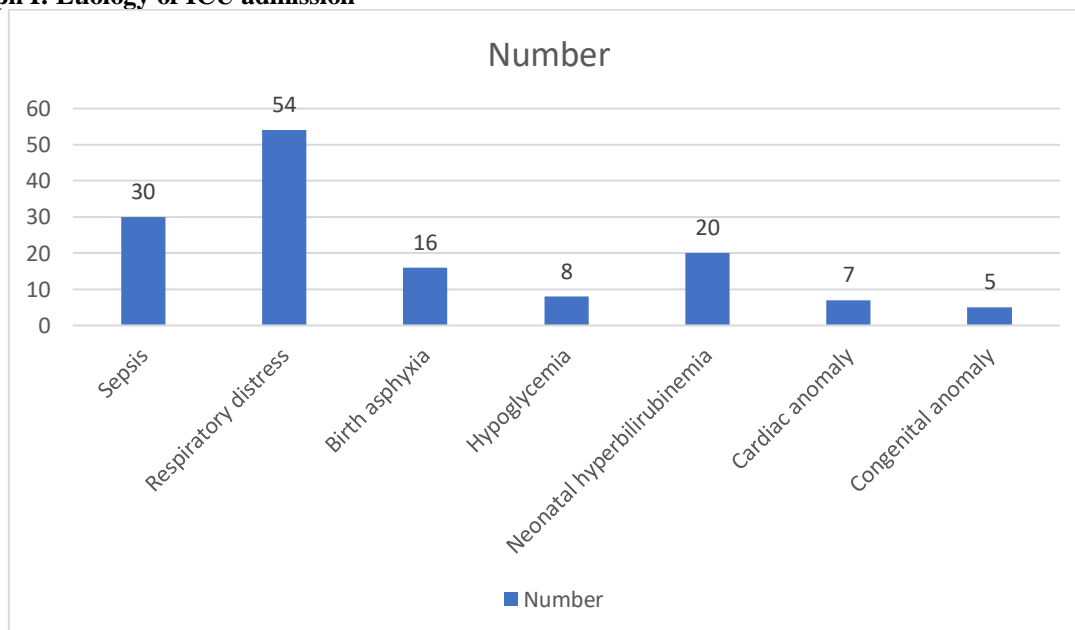
Table III: Neonatal and maternal characteristics

Parameters	Variables	Number	P value
Gestational age (weeks)	<34	64	0.17
	34–36.6	46	
	37	30	
Birth weight (grams)	1500	75	0.05
	1500-2500	42	
	>2500	23	
Mode of delivery	Vaginal	58	0.04
	caesarean	82	

Table III, graph II shows that gestational age was <34weeksin 64, 34–36.6weeksin 46 and >37weeksin 30. Birth weight was 1500gramsin 75, 1500-2500gramsin 42 and >2500gramsin 23. Mode of delivery was vaginal in 58 and caesarean in 82. The difference was significant (P< 0.05).

Graph II: Neonatal and maternal characteristics
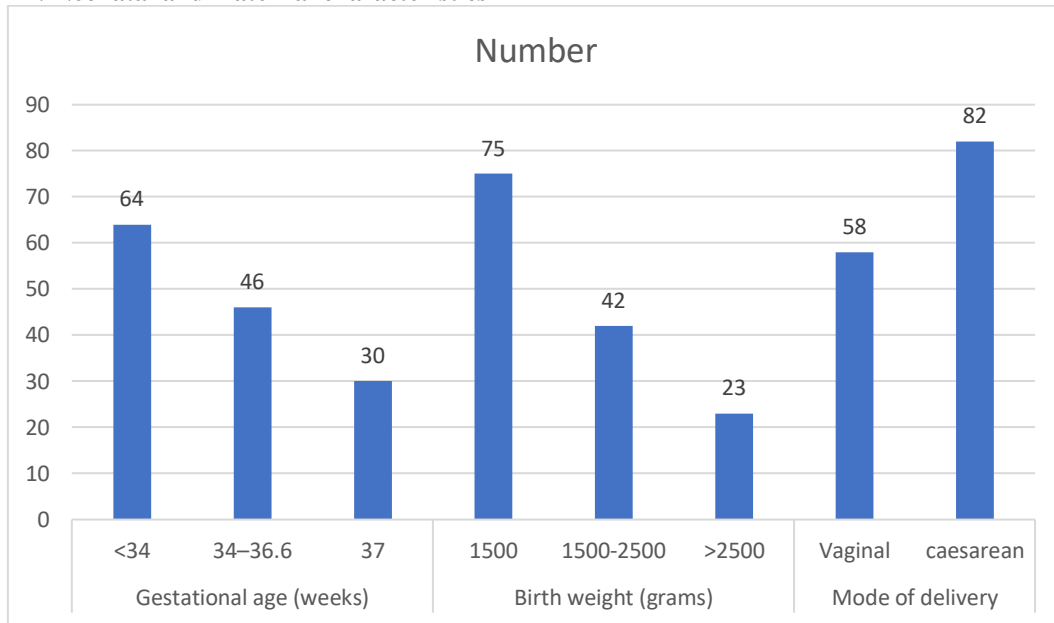
DISCUSSION

Although delivery at term gestation is considered to be low risk, mature neonates with normal birth weight might exhibit certain illnesses that require escalation of care and admission to the NICU.[7,8]First 48 hours immediately following birth is t\he most crucial period for newborn survival.[9,10]The present study was conducted to assess metal ion release from different bracketarchwirecombinations.

We found that out of 140 patients, males were 80 and females were 60. Verma et al[11] in their study 1424 newborns admitted within 24 hours of birth were included. About 767 were male neonates, (Male: female1.16:1). The low birth weight babies were 54% in our study. Among the various causes of NICU admission, Respiratory distress was present in 555 (39%) of neonates, respiratory distress syndrome (Hyaline membrane disease) being the most common cause of respiratory distress. Neonatal sepsis accounted for morbidity in 24% of neonates, with Klebsiella being the most common organism grown in the blood culture. The incidence of congenital anomalies was 2.5%. The neonatal mortality was found to be 11% in our study. Prematurity with Respiratory distress syndrome (Hyaline membrane disease) and perinatal asphyxia were the two most common causes of neonatal mortality in the study.

We found that etiology of NICU admission was sepsis in 30, respiratory distress in 54, birth asphyxia in 16, hypoglycemia in 8, neonatal hyperbilirubinemia in 20, cardiac anomaly in 7 and congenital anomaly in 5 cases. Salama et al[12]included 153 cases of neonatal sepsis; 63 (41.2%) EOS and 90 (58.8%) LOS. The majority of the neonates had very low or moderately low birth weight (90.9%). All neonates received first-line antibiotics in the form of ampicillin-sulbactam, and gentamicin. Second-line antibiotics were administered to 133 neonates (86.9%) as vancomycin

and imipenem-cilastatin. Mortalities were more common among EOS group ($p < 0.017$). Positive blood cultures were detected in 61 neonates (39.8%) with a total number of 66 cultures. The most commonly encountered organisms were Klebsiella MDR and CoNS (31.8% each). Klebsiella MDR was the most predominant organism in EOS (28.9%), while CoNS was the most predominant in LOS (39.2%) The detected organisms were divided into 3 families; enterobacteriaceae, non-fermenters, and gram-positive family. There 3 families were 100% resistant to ampicillin. The highest sensitivity in enterobacteriaceae and non-fermenters was for colistin and polymyxin-B. An HSS of 3–8 had a sensitivity and specificity of 62.3% and 57.6%, respectively for diagnosis of culture-proven sepsis.

We found that gestational age was <34weeks in 64, 34–36.6weeks in 46 and >37weeks in 30. Birth weight was 1500grams in 75, 1500-2500grams in 42 and >2500grams in 23. Mode of delivery was vaginal in 58 and caesarean in 82. Takleab et al[13] found that the most common primary diagnoses at admission to the neonatal care unit were prematurity with respiratory problem (36.6%), neonatal sepsis (22.7%), and asphyxia (16.2%). Out of the 216 neonates studied, 50 (23.2%) died. High case fatality was observed among neonates with the diagnosis of prematurity with respiratory problem (40.5%) and asphyxia (40.0%). Under multivariate analysis, diagnosis of asphyxia was an independent predictor of mortality while gestational age above the mean of the study population (36.6 weeks) was protective of mortality.

Panda PK et al[14]found that of 4127 total NICU admissions, 3159 (76%) newborns were discharged. The most common indications for admissions in inborn babies were prematurity and related complications (23%), birth asphyxia (19%), and neonatal hyperbilirubinemia (18%). For

outbornnewborns, along with these causes, neonatal sepsis (20%) was another important cause of NICU admission. Escherichia coli and Klebsiella species were predominant microorganisms to be isolated in blood culture. About 11% of newborns received kangaroo mother care, with median duration of 6 days. Predominant causes of death among newborn babies were prematurity-related complications (51%) and neonatal sepsis (37%).

The limitation the study is small sample size.

CONCLUSION

Authors found that the most common indication forNICU admission was sepsis, respiratory distress, birth asphyxia, hypoglycemia, neonatal hyperbilirubinemia, cardiac anomaly and congenital anomaly.

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