Original Research Article

A study of neonatal outcome in patients admitted to NICU of tertiary care hospital

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Abstract

Background: The neonatal period consist of period from birth to 28 days of life, is the most vulnerable period as a newborn requires adaptation to ex-utero environment. As of 2015, in India, the neonatal mortality rate is 28/1000 live births. Neonatal morbidity and mortality rates reflect a nation's socioeconomic status, as well as the efficiency and effectiveness of their healthcare services. This study primarily aimed at neonatal outcome of neonates admitted in NICU of our tertiary care hospital. **Material and Methods:** This prospective, observational, descriptive study was conducted in the NICU department. All neonates admitted in NICU in specified time period were considered for the study. **Results:** During study period total of 1684 neonates were admitted, male were 989 (58.72%) and female were 695 (41.27 %). Vaginal delivery was common mode of delivery seen in (77.6 %), followed by LSCS (22.44 %). Preterm neonates i.e. before 37 weeks were 40.85% and term neonates were 59.15%. Almost 30% admissions were referred from outside for further management. We noted overall neonatal mortality 27.14 %. Preterm with hyaline membrane disease, perinatal asphyxia, meconium aspiration syndrome and neonatal sepsis were leading causes of neonatal morbidity and mortality in our institute. **Conclusion:** Proper antenatal, intrapartum care, strengthening of peripheral centers can reduce neonatal mortality and morbidity.

Keywords: NICU, Neonatal mortality rate, preterm neonate.

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INTRODUCTION

The neonatal period consist of period from birth to 28 days of life, is the most vulnerable period as a newborn requires adaptation to ex-utero environment. Many times, due to intrapartum or early neonatal problems, neonates have to face mortality and morbidity. The risk of a newborn dying is 24 per 1,000 live births in the first week of life, 3 per 1,000 per week during the rest of the first month, and 0.12 per 1,000 per week after the first year of life[1]. As of 2015, in India, the neonatal mortality rate is 28/1000 live births[2]. Common causes of morbidity and mortality in neonates are mainly severe infection, hypothermia, Low birth weight and asphyxia[3]. Neonatal morbidity and mortality rates reflect a nation's socioeconomic status, as well as the efficiency and effectiveness of their healthcare services[4]. Also, these are important indicators in planning for improved healthcare delivery. Despite the decrease in neonatal deaths by 17% over the last decade, 3.1 million newborns died in 2010 most of them belonging to developing countries. The 2030 Agenda for Sustainable development (WHO) calls for reduction in neonatal mortality to 12/1000 live births by 2030. It will need largescale application of policies to reduce neonatal mortality and morbidity. This study primarily aimed at neonatal outcome of neonates admitted in NICU of our tertiary care hospital.

MATERIAL AND METHODS

This prospective, observational, descriptive study was conducted in the NICU, Department of neonatology and

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paediatrics of the for a period of 1 year, from January 2018 to December 2018. All neonates admitted in NICU in specified time period were considered for the study. There were no any exclusion criteria. Approval was granted by institutional ethics committee. Basic demographic data, age, gender, weight, gestational age, mode of delivery, cause of admission, date of admission and discharge, admission diagnosis, whether the baby died or was discharged in a satisfactory clinical state, treatment received, etc. was collected in proforma. Detailed history, physical examination and relevant diagnostic investigations were also considered. Statistical analysis was done using descriptive statistics.

RESULTS AND DISCUSSION

During study period total of 1684 neonates were admitted. All relevant details were collected at admission, a provisional diagnosis labelled, later after investigation a final diagnosis confirmed. Collected data analysed, showing these findings.

Out of 1684 admitted neonate's male were 989 (58.72%) and female were 695 (41.27 %), it shows more male admissions. The ratio of male to female neonate was 1.42:1. The male predominance in this study is consistent with other studies[7,8]. This also can be explained by high biological survival in females, male neonates have more attention, etc.Out of the 1684 neonates, vaginal delivery was common mode of delivery seen in (77.6 %), followed by LSCS (22.44 %). Most common place of delivery was our own institute seen in 58.19 % neonates, rest 41.81 % were delivered outside. When compared with gestational age of neonate preterm i.e. before 37 weeks were 40.85% and term neonates were 59.15%. High contribution of preterm neonates also noted by Ike Elizabeth U *et al*[9]. Mani Kant *et al*[8] noted 39 % contribution by preterm neonates.We have noted that almost 30% admissions were referred from outside for further management. This high referral rate is seen in study by Patil Ravindra B *et al*[10]. Causes of referral may be non-availability of higher facilities, financial, parents not satisfied with treatment, etc. According to birthweight Normal (>2500 gm), Low Birthweight (1500-2499 gm), Very Low Birthweight (1000-1499 gm), Extremely Low Birthweight (<1000 gm) babies were 32.18 %, 44.60 %, 15.20 %, 8.02 % respectively. Birthweight less than 2.5 kg needs more care, in our study 67.82 % were having birthweight less than 2.5 kg. Similar findings were noted by Veena Prasad *et al*[11]. Average length of stay was 3 + 1.2 days notes in our study, most patients discharged within 7 days of admission. We noted overall neonatal mortality 27.14 %. This finding is similar with Parkash J *et al* (25%). Other studies documented neonatal mortality from 18.68%[11] to 35% [12]. this wide variation is due to different clinical, social and administrative reasons. Most common cause of admission was respiratory complications as preterm with hyaline membrane disease (22.32 %) and perinatal asphyxia (20.31%) followed by Meconium aspiration syndrome (11.16%) and neonatal sepsis (10.89%). Similar findings were noted in other studies also[13,14] Most common causes can be easily tackled with proper antenatal and intranatal care. Role of corticosteroids in preterm neonates and standard intranatal care required to control neonatal morbidity and mortality. Preterm with hyaline membrane disease, perinatal asphyxia, meconium aspiration syndrome and neonatal sepsis were leading causes of neonatal mortality in our institute contributing 5.70 %, 5.17 %, 3,21 % and 3.68 % respectively. This is in accordance with the Indian national figures where prematurity and birth asphyxia are the leading causes of death[15], and other researchers as Raghavendra N[7], Garg *et al*[12].Prematurity, low birth weight, unattended delivery or delivery attended by unskilled persons, poor neonatal care are major risk factors for neonatal mortality and morbidity.

Table 1: Characteristic of the neonates admitted in NICU

Characteristic	n= 1684	Percentage
Sex		
Male	989	58.73
Female	695	41.27
Male: female ratio	1.423021583	
Type of delivery		
Vaginal	1290	76.60
Instrumental	16	0.95
LSCS	378	22.45
Gestational age		
Less than 37 weeks	688	40.85
More than 37 weeks	996	59.15
Place of delivery		
Own institute	980	58.19
Outside hospital having NICU setup	548	32.54

Outside hospital not having NICU setup	89	5.28
Home	67	3.99
Primary admission done at		
Own institute	1190	70.66
Referred from outside	494	29.34
Length of stay in NICU		
1-2 days	398	23.63
3 - 7 days	820	48.69
> 7 days	466	27.68
Birthweight in grams		
Normal (>2500)	542	32.18
Low Birthweight (1500-2499)	751	44.60
Very Low Birthweight (1000-1499)	256	15.20
Extremely Low Birthweight (<1000)	135	8.02

Table 2: Outcome wise analysis of NICU admissions

	No. of admissions	Discharged with recovery	Death	Referral to higher center	Discharge against Medical Advice	Percentage contribution to total mortality	mortality percentage from total admissions
Preterm neonates (<37 weeks) (n=688)							
hyaline membrane disease	376 (22.32 %)	188	96	39	53	21	5.70
Sepsis	89 (5.28 %)	53	24	2	10	5.25	1.42
multiple congenital anomalies	98 (5.82 %)	42	22	30	4	4.81	1.31
Other morbidities	125 (7.42 %)	46	35	5	39	7.66	2.08
total	688	329	177	76	106	38.73	10.51
Term neonates (>37 weeks) (n=996)							
Perinatal asphyxia	342 (20.31 %)	179	87	44	32	19.04	5.17
Meconium aspiration syndrome	188 (11.16 %)	92	54	21	21	11.81	3.21
Early onset neonatal sepsis	45 (2.67 %)	12	19	6	8	4.16	1.13
Late onset neonatal sepsis	139 (8.25 %)	54	43	13	29	9.41	2.55
Pneumonia	38 (2.26 %)	14	11	5	8	2.41	0.65
Neonatal jaundice	60 (3.56 %)	36	12	1	11	2.62	0.71
Congenital heart disease	45 (2.67 %)	4	14	18	9	3.06	0.83
Hypoglycemia	82 (4.87 %)	37	28	9	8	6.13	1.66
Other morbidities	57 (3.38 %)	26	12	10	9	2.62	0.71
Total (n=996)	996	454	280	127	135	61.27	16.62
total NICU admissions	1684	783 (46.5 %)	457 (27.14 %)	203 (12.05 %)	241 (14.31%)		

CONCLUSION

Neonatal sepsis (early and late onset), low birth weight, prematurity, respiratory distress syndrome, neonatal jaundice, hypoxic ischemic encephalopathy, congenital heart disease are major causes of both neonatal mortality and morbidity. Proper antenatal, intrapartum care, strengthening of peripheral centers can reduce neonatal mortality and morbidity.

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