Research Article

Clinical Profile and Outcome of Babies Admitted to Neonatal Intensive Care Unit (NICU), Mc Gann Teaching Hospital Shivamogga, Karnataka: A Longitudinal Study

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Abstract: The objectives of the study were **t**o assess the commonest causes for admission and outcome of neonates admitted to NICU. It was a descriptive longitudinal study performed during February 2014 to July 2014 (6months) with 1041 neonates admitted during the study period. Prestructured-pre tested closed ended questionnaire was used to collect the data on inborn or outborn admission, sex, gestational age, weight for gestation, referral centre, age at presentation, indications for admission, duration of hospitalization, complications encountered, procedures done during hospitalization and outcome. The total study subjects was 1041, Low birth weight and associate complications was seen in 526 babies (50.6%). One in every third baby admitted in our NICU was a pre-term baby (34.5%). The commonest specific morbid reason for admission was respiratory distress syndrome (n=389; 37.3%) followed by neonatal jaundice (n=143; 13.7%) and meconium aspiration syndrome (n=143; 13.7%). It was found that maximum (n=858, 82.4%) number of babies were discharged after improvement, 42 (4%) left against medical advice, only 1 baby was referred to higher centre which was required surgical intervention and there were 140 (13.4%) mortalities. Commonest cause for mortality was prematurity (42.1%). Low birth weight and prematurity are the common causes for admission in the NICU. Respiratory distress syndrome, neonatal jaundice and meconium aspiration syndrome are some important and leading causes of morbidity in newborn babies. Commonest causes for mortality were prematurity, Respiratory distress syndrome, Birth asphyxia and Sepsis.

Keywords: Neonatal Intensive Care Unit (NICU), Low Birth Weight (LBW).

INTRODUCTION

Yearly child mortality rates in India have fallen between 1·7%1 and 2·3% in the past two decades. Despite this decrease, the United Nations (UN) estimates that about 2·35 million children deaths are happening in India every year. This figure corresponds to more than 20% of all deaths in children younger than 5 years worldwide, which is more than in any other country. We know that contribution of neonatal mortality is the highest for under five mortality [1]. One of the United Nations Millennium Development Goals is the reduction by two-thirds of the mortality among children <5 years of age by 2015. The global burden of neonatal death is primarily concentrated in developing countries, where care of neonates is practically non-existent. Of the 4 million neonatal deaths that occur every year, 98% are in the poorest countries of the world. In India, as many as 1.72 million children die annually before reaching their first birthday and, of these, 72% die during their first month of life,the

neonatal period. The neonatal mortality rate varies by state but, overall, it is reported to be 39 per 1,000 live births in India [2]. Neonatal period is a very vulnerable period of life due to many problems which can occur, more so in babies born preterm or low-birth weight. Most of the causes of neonatal morbidity and mortality are preventable. (3) For applying the preventive strategies we have to have the data on morbdties which claiming the neonatal life. So, we under took this study to assess the commonest causes for admission and outcome neonates admitted to the neonatal intensive care unit (NICU).

METHODOLOGY

The study was a descriptive -longitudinal observational study carried out in the neonatal intensive care unit (NICU) of the Department of Pediatrics, Mc Gann Teaching Hospital attached to Shivamogga Institute of Medical Sciences Shivamogga, Karnataka. The study was conducted between February 2014 to

July 2014 for 6 months. All neonates admitted to the NICU during the study period were included in the study. After obtaining permission of Head of the Institute and taking informed consent from parents of the baby or any guardian, data of all the admitted babies were recorded by visiting baby at least 3 times. Prestructured-pre tested closed ended questionnaire was used to collect the data on inborn or outborn admission, sex, gestational age, weight for gestation, referral centre, age at presentation, indications for admission, duration of hospitalization, complications encountered, procedures done during hospitalization and outcome. Ethical clearance was obtained by Institutional ethical committee. Data were entered and analyzed using excel spread sheet.

RESULTS

During the period of study, there were a total of 1041 neonates admitted to the NICU; 762 babies (76%) were inborn; rest (279, 26%) were outborn (referred from the other hospitals) (Table 1). Almost equal percentage of male and female babies were admitted (Male: Female= 605:436) (Table 2). Low birth weight and associate complications was seen in 526 babies (50.6%), remaining babies had normal birth weight (Table 3). One in every third baby admitted in our NICU was a pre-term baby (34.5%), remaining 67.6% were term babies (Table 3). The commonest specific morbid reason for admission was respiratory distress syndrome (n=389; 37.3%) followed by neonatal jaundice (n=143; 13.7%) and meconium aspiration syndrome (n=143; 13.7%). Respiratory distress

syndrome was found more in out born babies (52% total outborn babies) compared to inborn ones (32% of total inborns), while meconium aspiration syndrome and jaundice was found more in inborn babies (Table 3). Antibiotics (561) and oxygen (416) were the common interventions used for the management, while phototherapy was used only for 125 babies (Most of the time multiple therapies were used to manage life threatening morbid conditions) (Fig. 1).

It was found that maximum (n=858, 82.4%) number of babies were discharged after improvement, 42 (4%) left against medical advice, only 1 baby was referred to higher centre which was required surgical intervention and there were 140 (13.4%) mortalities, the mortality was more in outborn babies (18.6% of total outborn admissions).(Table: 3).

Table 1: Mode of admissions

Admissions	Number	Percentage (%)
Inborn	762	74
Outborn	279	26
Total	1041	100

Table 2: Gender-wise distribution

Admissions	Number	Percentage (%)
Males	605	58
Females	436	42
Total	1041	100

Table 3: Distribution of neonates according to birth weight, gestational age at delivery, morbidity profile and outcome of admission

	Inborn number (%)	Outborn number (%)	Total number (%)
Distribution of neonates as per birth weight			
>2500	417(54.7%)	98(35%)	515(49.4%)
1500-2499	240(31.4%)	94(33.7%)	334(33.1%)
<1500	105(13.7%)	87(31.1%)	192(18.6%)
Gestational Age at the time of delivery			
Term	473(62%)	213(76.3%)	686(65.8%)
Preterm	289(38%)	66(23.7%)	355(34.2%)
Morbidity profile of Neonates			
Respiratory Distress Syndrome	244(32%)	145(52%)	389(37.3%)
Meconium Aspiration	126(16%)	17(6%)	143(13.7%)
HIE – Mod- Severe Asphyxia	56(7.3%)	18(6.4%)	74(7.1%)
Sepsis/Pneumonia/Meningitis	43(5.6%)	11(4%)	54(5.1%)
Jaundice	117(15.3%)	26(9.3%)	143(13.7%)
Hypothermia	17(2.2%)	10(3.5%)	27(2.5%)
Others	159(20.8%)	52(18.6%)	211(20.2%)
Outcome			
Discharge	644(84.6%)	214(76.7%)	858(82.4%)
Referral	01(0.001%)	00	01(0.0009%)
DAMA	29(3.7%)	13(4.6%)	42(4.05%)
Died	86(11.4%)	52(18.6%)	140(13.4%)
Total	762(100)	279(100)	1041(100)

Commonest causes for mortality were prematurity (42.1%) and Respiratory distress syndrome (16.4%). Birth asphyxia and Sepsis together were the cause of death in 12% of the total deaths (Table 4). Mortality was seen most frequently in the babies born preterm (n=89; 635). Mortality rate was seen more in the outborns as compared to the inborns (77% vs 55.6%). Overall mortality was observed more in the babies having birth weight small for gestational age (65.6%) as compared to appropriate for gestational age (34.2%) (Table 4).

Table 4: Distribution of Neonatal deaths

|	Inborn number (%)	Outborn number (%)	Total number (%)
Birth weight at the time of death			
>2500	37(42%)	11(21%)	48(34.2%)
1500-2499	25(28.4%)	15(29.0%)	40(28.5%)
<1500	26(29.5%)	26(50%)	52(37.1%)
Neonatal deaths Gestational Age at the time of delivery			
Term	20(22.7%)	8(15.3%)	28(20.0%)
Preterm	68(77.3%)	44(84.7%)	28(20%)
Causes of Neonatal deaths			
Respiratory Distress Syndrome	14(16%)	19(17.3%)	23(16.4%)
Meconium Aspiration	14(16%)	03(5.7%)	17(12.1%)
HIE – Mod- Severe Asphyxia	10(11.3%)	02(3.8%)	12(8.5%)
Sepsis/Pneumonia/Meningitis	04(4.5%)	03(5.7%)	07(05%)
Congenital malformations	04(4.5%)	26(9.3%)	143(13.7%)
Prematurity	32(36.3%)	27(52%)	59(42.1%)
Others	10(11.3%)	07(13.5%)	17(12.1%)
Duration of time between admissions and deaths			
<1 Day	73(83%)	31(59.6%)	104(74.8%)
1 – 6 Days	12(13%)	17(32.8%)	29(20.7%)
>7 Days	03(3.5%)	04(7.6%)	07(5%)
Total	88(100)	52(100)	140(100)
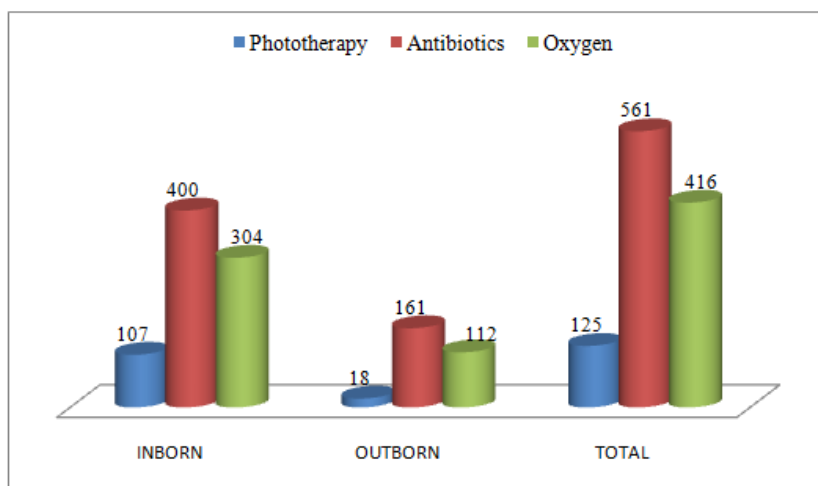
Fig. 1: Treatment given for Neonates

DISCUSSION

Neonatal period is the most vulnerable period of life due to different diseases, which in most cases are preventable. It is clear from NFHS-3 that neonatal mortality (39/1000 live births) is very high in India, which accounting for 25% of the all neonatal mortality in the world. So , it is essential keep an eye over neonatal services to make it to move on the track to reduce neonatal morbidities and mortalities, thus can reduce the infant mortality , for which the neonatal mortality is the great contributor (75% of total infant mortalities) [4]. During the study period, 1041 neonates were admitted, among them 76% were inborn; rest (24%) were outborn, who were referred from different private hospitals in the city and government and private hospitals in the sub-district level of Shivamogga and other surrounding districts. Similar findings are reported from study conducted by Veena Prasad and Nuthan Singh in Uttarkhand [4].   In our study 50.6% (526) of babies had low-birth weight. In total admitted cases one every third baby was a pr-etem baby (34.5%). It indicates that neonatal low birth weight and pre-term

deliveries are the important contributors for NICU admission. Similar findings are noted in other studies where the incidence of low birth weight ranges from 41.2% to 53% [3]. Our study results on low birth rate and premature admission is consistent with the results of study conducted by Garg P *et al*. in New Delhi [5]. In another study conducted by Gauri Shankar *et al*. reported that the proportion rate of premature admission was 23.2 % [6]. The commonest specific morbid reason for admission was respiratory distress syndrome (n=389; 37.3%) followed by neonatal jaundice (n=143; 13.7%) and meconium aspiration syndrome (n=143; 13.7%). Another study done in New Delhi has commented on sepsi as being the commonest reason for admission followed by birth asphyxia and pneumonia [7]. A study conducted by Gauchan E in Nepal highlighted that jaundice, sepsis and perinatal asphyxia as being the commonest indication for admission in the neonatal intensive care unit [3]. 13.4% of neonatal mortality was observed in our study during study period, the mortality was more in outborn babies (18.6% of total outborn admissions) which is similar to studies in Nepal [3], Pakistan [8] and South Africa [9]. The rate of mortality was lower than the report of study conducted by Veena Prasad *et al*. [4] in Uttarkhand. Commonest causes for mortality were prematurity (42.1%) and Respiratory distress syndrome (16.4%). Birth asphyxia and Sepsis together were the cause of death in 12% of the total deaths. Similar results reported in studies conducted in New delhi and Nepal [3, 4].

CONCLUSION

According to our study, low birth weight and prematurity are the common causes for admission in the NICU. Respiratory distress syndrome, neonatal jaundice and meconium aspiration syndrome are some important and leading causes of morbidity in newborn babies. Commonest causes for mortality were prematurity, Respiratory distress syndrome; Birth asphyxia and Sepsis are the common causes of neonatal mortality. Most of the morbidities and subsequently the mortalities can be prevented by improving and effective implementation of important preventive services like maternal care and IMNCI, timely interventions and timely referral to tertiary care centres for delivery of high risk pregnancies and care of neonates in high risk situation. We strongly recommend a further multicentre studies include all the government and private hospitals at district and sub district level to know the exact magnitude problems.

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