Mortality profile and out come analysis in level two SNCU in tribal medical college district Adilabad Telangana

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Abstract
Introduction: Neonatal period is a very vulnerable period of life due to many problems. India alone contributes to about 25% of neonatal mortality around the world. In spite of advances in perinatal and neonatal care, neonatal mortality is still high in developing countries. This study was undertaken to study the disease pattern and outcome of neonates admitted to the sick neonatal intensive care unit (SNCU) of a tribal teaching hospital Adilabad
Study Design: Retrospective study of medical records for 1 year (January 2015-December 2015) from SNCU Softwere.
Materials and Methods: Neonates admitted to SNCU, Adilabad Rajiv Gandhi institute of medical sciences included in the study; the data which were recorded in predesigned proforma in SNCU software. The data were analyzed using appropriate statistical tool.
Results: A total of 1326 neonates were admitted to SNCU during the study period, 147neonates left against medical advice, 51 were referred to other centre hence excluded from analysis. The ratio of the males to female admitted was 1.42:1. In this study, overall mortality rate was 13.7%. Most of the deaths were due to birth asphyxia (49.55%), RDS (38%), neonatal sepsis (10.6%), Neonates with birth weight <1500 g had poor outcome compared to neonates with birth weight more than 2500 g.
Conclusion: This study identified birth asphyxia, RDS and neonatal sepsis as the major contributors to the neonatal mortality. Improving antenatal care, maternal health improve neonatal outcome.

Keywords: Birth asphyxia, Neonatal mortality, Neonatal sepsis, RDS.

Introduction
The neonatal period is a very vulnerable period of life due to many problems, which in most of the cases is preventable.[1,2] Of the 25 million babies born in India every year one million die, India alone contributes to 25% of neonatal mortality around the world. As per the National Family Health Survey[3] report, current neonatal mortality rate (NMR) in India is 39 per 1000 live births, neonatal deaths accounts for nearly 77% of all infant deaths (57/1000) and nearly half of under-five child deaths (74/1000).[3] Preterm and low birth weight (LBW) babies are at increased risk of perinatal mortality and morbidity.[4] As per the report sheet published in the Lancet, the major direct causes of neonatal mortality are pre-term birth (27%), infection (26%), asphyxia (23%), congenital anomalies (7%), others (7%), tetanus (7%), and diarrhoea (3%).[5] There are very scanty data which are available regarding the neonatal mortality and morbidity pattern in India. Advancement in perinatal and neonatal care have significantly helped in reducing NMR in developed countries, but the mortality and morbidity are still high in developing countries.[6] This study was undertaken to study the disease pattern and outcome of neonates admitted to the special newborn care unit (SNCU) of a secondary care teaching hospital located in Adilabad district, a tribal area in Telangana state, India.

Materials and Methods
This hospital based retrospective study was carried out in the SNCU, Department of Pediatrics, at Rajiv Gandhi Institute of Medical Sciences, Adilabad, Telangana, India, for a period of 1 year from January 2015 to December 2015. l. Our SNCU caters to the population of Adilabad district and referral from neighboring areas like kinwat of Maharashtra state. Approximately 6500 deliveries are conducted per year in the hospital; the majority of patients belong to below poverty line income group. Our SNCU has bed strength of 20, facility for phototherapy, surfactant administration, exchange transfusion, BUT no ventilation care are available. A retrospective case record review and analysis of all the newborn babies admitted to the SNCU during the study period was done and neonates satisfying inclusion and exclusion criteria were included in the study.

Inclusion criteria
All neonates admitted to SNCU

Exclusion criteria
Neonates who left hospital against medical advice (LAMA) and neonates who were referred due to non-availability of ventilator support and surgical intervention were excluded from the study. These neonates were categorized as inborn if delivered in the Medical college Hospital and as outborn if born outside. The data were recorded in predesigned Proforma.

Statistics
Data collected were compiled and entered in MS Excel spreadsheet and analyzed using appropriate statistical tools in Open Epi statistical software.

Results

A total number of babies admitted to SNCU during the Study period was 1326 of which 147 neonates LAMA and 51 neonates were referred to other centres hence these Neonates were excluded from the study. A total of 1128 Neonates were included for the data analysis. Out of this 58.78% (663) were male and 41.22 (465) were females, ratio is 1.42:1. Of the total admissions 62.5% (706) were inborn neonates and 37.4% (422) were outborn neonates (Table 1). 40.9% (462/1128) neonates had birth weight >2500 g, 42.5% (480/1128) of neonates belonged to LBW category (1500-2499 g), 14.1% (160/1128) of neonates belonged to very LBW (VLBW) group (1499-1000 g), 2.3% (26/1128) of neonates were of extremely LBW (ELBW) category (<1000 g). On applying one sample Chi-square test to see the observed frequency distribution in males and females neonates overall admitted to SNCU, it was found to be statistically significant ($P < 0.001$). In this study, overall SNCU mortality rate was 13.7% (155/1128). The mortality rate in inborn neonates was 54.8% (62/113) whereas mortality rate in out born neonates was 55.1% (51/113), the difference in mortality rate between inborn and outborn neonates was statistically insignificant cant ($P = 0.284$). The mortality in males was 13.0% (86/155), in females was 14.8% (69/155), the difference in the mortality rate among male and female neonates was statistically insignificant cant ($P = 0.596$)**.** The major causes for mortality were hypoxic ischemic encephalopathy/ Birth asphyxia 36.1, RDS (27.7.0), and, prematurity is still on higher side (21.9%), neonatal sepsis (7.7%) (Table 3). On comparing survival among different birth weight groups (Table 4), it was seen that there was statistically significant difference between VLBW and normal birth weight group ($P \leq 0.05$), and between ELBW and normal birth weight group ($P \leq 0.05$). However, there was no statistically significant difference in survival among LBW and normal birth weight group ($P = 0.368$). It was observed that the duration of time between admission and death was <1 day in 61.6% of deaths (45/155) followed by 1-3 days in 14.9% of deaths (87/155).

Table 1: Admission by gender

	Total	Male	Female
Inborn	706	432	271
Outborn	422	230	189

Table 2: Mortality comparison by weight on admission

	Total	<1000 Gms	1000-1499 Gms	1500-2499 Gms	>=2500 Gms
Admission	1123	26	160	478	459
Mortality	155	17	37	54	47

Table 3: Cause of death profile: SNCU RIMS Adilabad, TS

Cause of Death profile	Inborn	Out born	Percentage
HIE / Moderate-Severe Birth Asphyxia	33	23	56 (36.1%)
Meconium Aspiration Syndrome	2	0	2 (1.3%)
Respiratory Distress Syndrome	21	22	43 (27.7%)
Prematurity (<28 weeks of Gestation)	24	10	34(21.9%)
E.L.B.W. (Wt. less than 1000g)	1	4	5 (3.2%)
Sepsis	6	6	12 (7.7%)
Any Other	1	2	3 (1.9%)
	78	67	100%

Table 4: SNCU outcome in different birth weight group

Birth weight SNCU	SNCU admission	Deaths (%)	Percentage of death is each group (%)
More than 2500 g	462 (41.0)	47 (10.2)	10.1
LBW (1500-2499 g)	480 (42.6)	54(11.3)	11.2
VLBW (1000-1499 g)	160 (14.2)	37 (23.1)	23.1
ELBW (<1000 g)	26 (2.3)	17 (65.4)	65.3
Total	1128 (100)	155 (13.7)	13.7

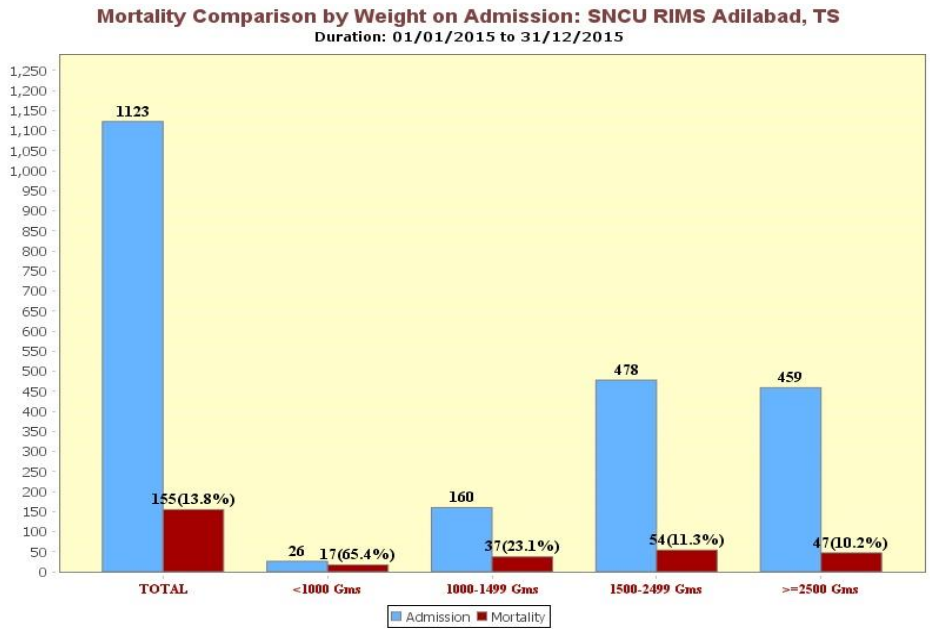

Fig. 1

Discussion

This study was conducted to delineate the outcome and factors leading to mortality of neonates admitted to SNCU of secondary care teaching hospital. Precise data regarding mortality pattern for SNCU admission are useful for many reasons.

In present study the admissions of male babies were more than that of female babies. It is due to the biological vulnerability of male gender and may be due to the preference of male child in the society. Similar findings were reported from various studies conducted in different parts of India.[7-13]

In our study, total of 1326 neonates were admitted of which 62.5% neonates were inborn and rest were outborn babies (37.4%), male preponderance of admission to SNCU was note.

According to the United Nation Children's Fund (UNICEF), "The state of world's children's report 28% of neonates were born with low birth weight in India.[13] But in our study 42.5% of neonates were low birth weight and 28.58% of neonates are born prematurely. This may probably be due to poor maternal health condition, low socio-economic status and less visits to health care facility. A study conducted by Gaucham *et al*. in Nepal reported that neonatal jaundice, sepsis and perinatal asphyxia as being commonest indication for admission to NICU. According to national neonatal perinatal database (NNPD) sepsis (36%) is the most common morbidity responsible for admission followed by prematurity (26.5%) and perinatal asphyxia (10%).[11] Birth asphyxia is an important cause of neonatal morbidity and mortality, its incidence in our study is 49.55% which is similar to findings of Chandra *et al*. RDS acts as an important cause for morbidity and mortality especially among LBW and preterm babies. Mortality rate observed in our study is 13.7%. The most common causes of mortality were birth asphyxia (36.1%), RDS (27.7%), prematurity (21.9%) Neonatal sepsis (7.7%).Similar pattern of outcome has been reported by study conducted by Rashid *et al.*[14] In contrast the study report published by ICMR reports sepsis (32.8%) as the major cause for neonatal mortality followed by birth asphyxia (22.3%) and prematurity (16.8%).[15] In the study done at JIPMER, sepsis was the cause for death in 52.3% of followed by birth asphyxia and injuries (29.23%). Majority of deaths in our study was attributable to birth asphyxia and RDS, this may probably be due to poor antenatal care, malnourished pregnant women, less availability of health facility, delivery by untrained professional and delay in referral from peripheral hospitals. Birth weight <1500 g were associated with high number of mortality in preterm neonates.

Conclusion

According to this study birth asphyxia, RDS and neonatal sepsis are leading causes of mortality in newborns. In spite of many advances in neonatal care above factors still continue to be the leading causes of mortality in neonates. The majority of morbidities and subsequently the mortalities can be prevented by improving antenatal care, maternal health, timely intervention, referring at appropriate time to tertiary care centres for high risk cases, preventing preterm deliveries and care of neonates at centres with facility. This study has some limitations, as this was a hospital based retrospective study, the cause of death was determined using the data available in case record sheets, Neonates who LAMA and those who were referred to other centres due to non-availability of ventilator support and surgical intervention were excluded from study and could hence modify the results. As the majority of the patients presenting to us belong to low socio-economic status, the results from this study cannot be a complete reflection of the problem in the community as a whole.

Source of funding

None.

Conflict of interest

None.

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