



## 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:** This study is a retrospective, descriptive study of medical record carried

out in the (SNCU) Department of Pediatrics, at the Rajiv Gandhi Institute of Medical Sciences, Adilabad, Telangana, for a period of 1 year from January 2015 to December 2015.

**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, 147 neonates left against medical advice (LAMA), 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 gm had poor outcome compared to neonates with birth weight more than 2500 gm.

**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.

### 1. Introduction

Neonatal deaths now account for over 40% of the under five deaths and must be addressed to accelerate progress towards the Sustainable Development Goal-3 (SDG3), since reducing the neonatal mortality to 12 per 1000 live births by 2030 is one of the Goal under SDG3 <sup>[1]</sup>. India is the epicentre of world's neonatal mortality with every fourth dying newborn of the world being Indian <sup>[1, 2]</sup> Close to 700,000 newborns die every year in India - a terrifying rate of neonatal deaths every minute <sup>[2]</sup>. In India nearly 67% of infant deaths occur in the neonatal period. Half of the neonates die in the first week of life <sup>[3]</sup>. Neonatal mortality rate of India was reported as 29 and the early neonatal mortality as 20, which contributed 53% to the IMR <sup>[3]</sup>.

Mortality risk is highest on the first day of life contributing up to 36% of all neonatal deaths-most of these due to birth Asphyxia.<sup>1</sup> Substantial decrease in the under five mortality has been achieved during the coming years but decrease in neonatal mortality has been much slower <sup>[4]</sup> In order to enhance the progress it is important that preventing neonatal deaths should be prioritized <sup>[4]</sup>. Since NMR contributes a major portion to IMR and under-five mortality(U5MR), there is an utmost need to bring down the neonatal deaths drastically to achieve these targets. SNCU, as a part of newborn care plays important role in the reduction of neonatal morbidity and mortality in the developing country <sup>[5]</sup>.

Most newborn deaths are preventable by improving the quality of care during delivery and care at birth. Simple interventions like skilled birth attendance & those staff who underwent NSSK training and access to emergency obstetric care can reduce NMR.

With this background, the present study was conducted with Aim of studying outcome of newborns admitted to the special newborn care unit (SNCU) at RIMS medical college Adilabad district, a tribal area in the State of Telangana, India.

### Materials and Methods

This study is a retrospective, descriptive study of medical record carried out in the Special Newborn Care Unit (SNCU) Department of Pediatrics, at the Rajiv Gandhi Institute of Medical Sciences, Adilabad, Telangana, for a period of 1 year from 1<sup>st</sup> January 2015 to 31<sup>st</sup> December 2015.

Our SNCU caters the population of the Adilabad district along with neighbouring areas such as the kinwat of the state of Maharashtra. About 6500 deliveries are done every year in the hospital; most patients belong to below Poverty line income group. Our SNCU has a bed strength of 20, with all the facility like phototherapy, administration of surfactants, exchange transfusion. A retrospective review and an analysis of the clinical cases of all newborn admitted to the SNCU were carried out during the study period and

The newborn meet the inclusion criteria were included in the study.

**Inclusion criteria**

All newborn admitted to the SNCU before 28 days of life

**Exclusion criteria**

Infants who left the hospital against the medical advice (LAMA) and infants who were referred for lack of available ventilator assistance and surgery were excluded from the study. The newborn who deliver in our hospital will be put in inborn section and those who were born out of the hospital will be enrolled in out born section.

After obtaining ethical committee approval, data of all admitted babies were recorded by analyzing all the case sheets from the records section and SNCU online software database. Data was collected as Inborn or out born section.

WHO definitions were used for term, Preterm, Low Birth weight (LBW), VLBW, ELBW

**Meconium Aspiration Syndrome.**

Diagnosed on basis of history, clinical and radiological finding.

**Birth Asphyxia**

Diagnosed on basis of APGAR less than 7 at 1 min

**Neonatal jaundice**

Diagnosed after assessment of serum bilirubin and in pathological zone as per AAP chart.

**Sepsis**

Diagnosed by clinical and appropriate lab screening test.<sup>6</sup>

**Congenital malformation**

Diagnosed on clinical features and diagnostic facilities like Ultrasound, Echocardiography, X rays.

A total number of newborn admitted to the SNCU during the study period was 1326, of which 147 LAMA, and 51 newborn were referred to other centres, therefore these

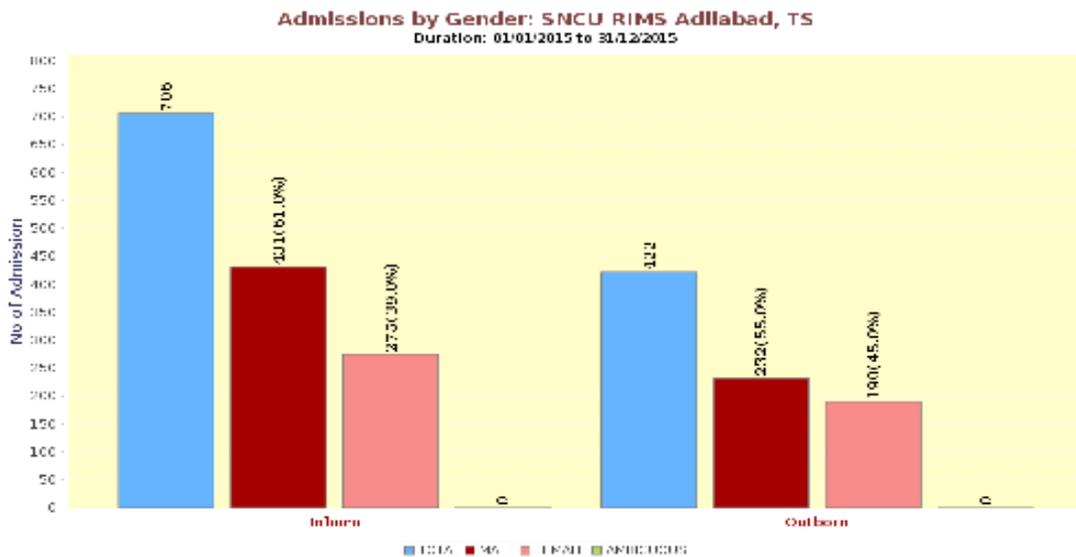
neonates were excluded from the study. A total of 1128 neonates were included for data analysis. Of this, 58.78% (663) were male and 41.22 (465) were females. The ratio is 1.42 : 1, Of the Hospitalizations 62.5% (706) were inborn neonates and 37.4% (422) were outborn neonates 40.9% (462/1128) of newborns had a birth weight > 2500 g, 42.5% (480/1128) of newborns belonged to the LBW category (1500-2499 g), 14.1% ( 160/1128) of newborns belonged to very LBW (VLBW) (1499-1000 g), 2.3% (26/1128) of newborns belonged to the extremely low weight category (ELBW) (<1000 g).In this study, the overall neonatal mortality rate was 13.7%(155/1128). The mortality rate in inborn children was 54.8% (62/113), while the mortality rate in Out born neonates was 55.1% (51/113), Mortality in male neonates was 13.0% (86/155), (Table no 1) in female it was 14.8% (69/155). The main causes of mortality were hypoxic ischemic encephalopathy / asphyxia at birth 56 (49.55), Respiratory distress syndrome 48(38.0) and neonatal sepsis/ meningitis 12 (10.6%) (**Table no 2**). It was observed that the period 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:** 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

**Table 2:** Comparison of deaths among inborn and Out born neonates

Cause of neonatal death	Inborn (%)	Outborn (%)	Total (%)
Respiratory distress syndrome	21 (23.9)	22 (32.8)	43 (38.0)
Sepsis/meningitis/pneumonia	6 (6.8)	6 (9.0)	12 (10.6)
Meconium aspiration syndrome	2 (2.3)	0	2 (1.7)
Hypoxic ischemic encephalopathy (birth asphyxia)	33 (37.5)	23 (34.3)	56 (49.55)
Congenital anomaly	0	0	
Total	62	51	113 (100)



**Fig 1**

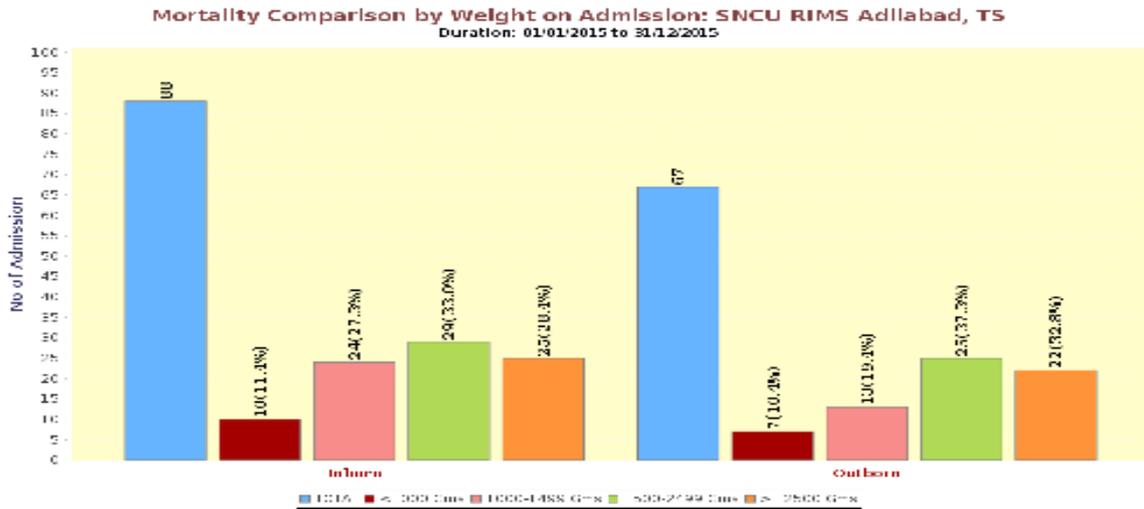


Fig 2

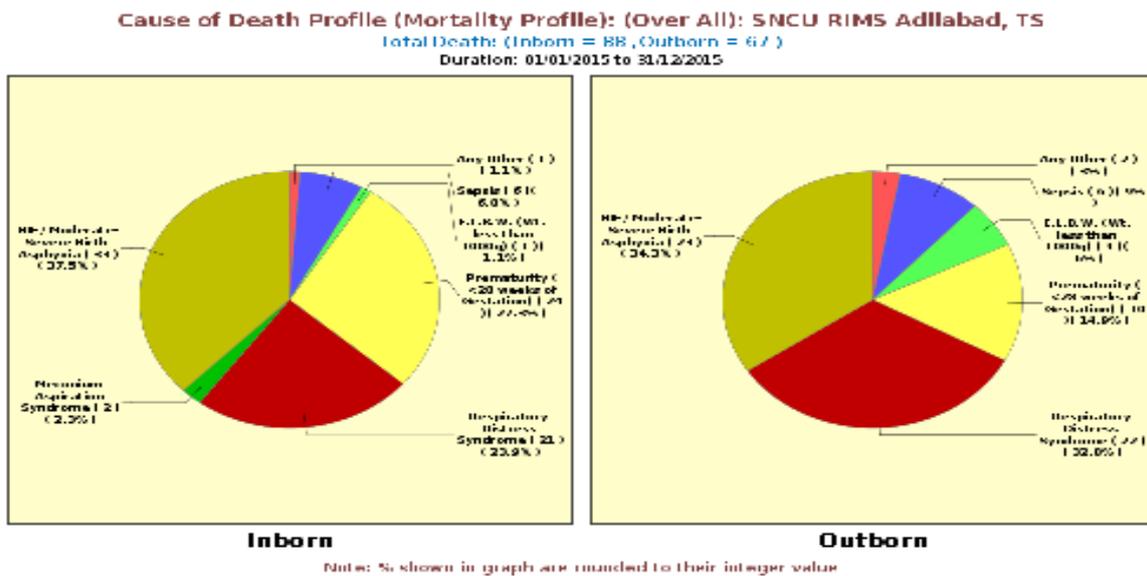


Fig 3

**Discussion**

Data according to disease pattern and mortality are useful for health care providers and policy makers to modify and plan treatment or interventions and evaluate the effectiveness of health care initiatives respectively. There is no tertiary care centre in 150 km radius near to this hospital. only referral centre is Hyderabad which is very far and also 70 % patient are tribal who never go to the referral centre on referral of the newborn.

The basic aim of study was to study the results and factors that lead to the mortality of newborn admitted to the level 2 SNCU care at tribal medical college. Accurate data on the mortality model for admission to the SNCU are useful for many reasons.

In the present study, the number of death in male newborn were more than those of female. It is due to the biological vulnerability of the male gender and may be due to the preference of the male child in society, Similar results have been reported from several studies conducted in different parts of India. <sup>7</sup> 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 NICU was noted similar admission pattern has been seen in study conducted by Roy *et al* <sup>[7]</sup>.

According to the United Nations Children's Fund (UNICEF) 28% of newborns was born with a low birth weight in India <sup>[8]</sup>. But in our study, the 42.5% of newborns were low birth weight and 28.58% of the admitted newborns were born prematurely, probably due to poor maternal health, poor socioeconomic status less Antenatal visit to the health facility, Similar rate of LBW and preterm baby admission has been reported by study conducted by Garg *et al* <sup>[9]</sup>.

According to the UNICEF report "The state of children in the world 2010", 28% of newborns were born with LBW in India) <sup>[10]</sup>. A study by Gaucham *et al.* in Nepal it has been reported that neonatal jaundice, sepsis and perinatal asphyxia are the most common indications for admission to neonatal intensive care <sup>[11]</sup>.

According to the national neonatal perinatal database (NNPD), neonatal sepsis (36%) is the most common morbidity responsible for admission, followed by prematurity (26.5%) and perinatal asphyxia (10%) <sup>[12]</sup>. Birth asphyxia is an important cause of neonatal morbidity and mortality. Its incidence in our study is 49.55%, which is similar to the results of Chandra *et al.* RDS acts as an important cause of morbidity and mortality in particular between LBW and premature babies.

Mortality rate observed in our study is 13.7%. The most

common causes of death were asphyxia at birth (49.55%), RDS (38%) and neonatal sepsis (10.6%). A similar study conducted by Rashid *et al* [13]. On the contrary, the study report published by the ICMR reports that sepsis (32.8%) is the main cause of neonatal mortality followed by asphyxia at birth (22.3%) and prematurity (16.8%) [14].

Nello study conducted at JIPMER, Sepsis was the cause of death in 52.3% of cases, followed by asphyxia and birth injuries (29.23%). Most deaths in our study were attributed to asphyxia at birth and RDS, probably due to poor prenatal care, malnourished and anaemic pregnant women, reduced availability of health services, delivery by untrained professionals and delays in referral of peripheral hospitals. Birth weight <1500 g was associated with high mortality in preterm infants.

### Conclusion

According to this study, asphyxia at birth, RDS and neonatal sepsis are the main causes of mortality in newborns. Despite many advances in neonatal care, the above factors remain the main causes of mortality in newborns. Most morbidity is later deaths can be prevented by improving prenatal care, maternal health, timely intervention, referring at the appropriate time to tertiary care centers for high-risk cases, avoiding premature births and assisting newborns in facilities with facilities

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.

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