



# Morbidity and Mortality Profile of Newborns Admitted in Special Newborn Care Unit at Tertiary Care Teaching Institute in Gujarat

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## Abstract:

### Background

NMR in India has always been an area of concern due to logistic issues in implementation of preventive and curative programs in a large and diverse country as ours. It has shown a slow but steady fall in the last 2 decades. The current NMR of Gujarat is 30 /1000 live births (2016) similar to the national NMR 34/1000 live births.

**Objectives:** To study the morbidity and mortality profile of newborns admitted to the Special Newborn Care Unit at GMERS Medical College and Hospital, Gotri, Vadodara.

**Methods:** A retrospective Study was carried out at the Special Newborn Care Unit (SNCU), Department of Pediatrics, GMERS Medical College of patients admitted over a period of two years from January 2016 to December 2017. Records of newborns admitted in SCNU were analyzed for causes of morbidity and mortality.

### Results:

2053 neonates were admitted over a period of 2 years out of which 54.8% were males, 50.2% were out born admissions, 48% were low birth weight and 37.2% were preterm babies. The chief causes of admission in SNCU were jaundice (34%), followed by Prematurity (16%), RDS (11.5%), perinatal asphyxia (12%) and prematurity (16.8%). Congenital anomalies were reported in 2.3%. The outcome rates for Survival, LAMA and death were 92%, 8% and 18% respectively.

### Conclusion:

Birth asphyxia, sepsis and preterm RDS are the leading causes of mortality in our study which are preventable. Therefore surveillance and training interventions aimed at these causes may be established and strengthened.

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**Keywords:** Morbidity, Mortality, SNCU, Gujarat

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## 1. Introduction

The development of any country is reflected by its growth indicators. WHO's leaders gathered together in 2000 to address the issue as one of the millennium development goals. Consensus was reached to reduce less than five child mortality to two - thirds by year 2015. Much has been done in this direction but progress has been slow .The highest contribution to infant and U5MR is neonatal mortality <sup>[1]</sup>. WHO states that 5.9 million children died under 5 years of age in 2015(16000deaths per day).<sup>[1]</sup> 4 million babies lose their lives within first month of birth. India contributes to one-fourth of the neonatal mortality world wide.<sup>[1]</sup> Commonest causes of neonatal mortality in India are Low Birth

Weight, Perinatal Asphyxia and Sepsis. Highest NMRs are reported from the African countries due to its fluid socio-political situation and Southeast Asian countries.

Government of India is investing its energy and resources in reducing the NMR with collaboration with NNF, IAP, WHO and many other NGOs to achieve the milestone.<sup>[2]</sup>

Gujarat is highly prosperous state of India with substantial budgetary allocation to health care. Neonatal Mortality Rate (NMR) has been slow to decline, from 37/1000 live births to 29/1000 live births over last few years.<sup>[3]</sup> The current NMR of Gujarat is 30/1000 live births (2016) which is similar to the national NMR 34/1000 live births. ENAP calls for NMR < 10/1000 live births by year 2035 in all countries.

There is evidence regarding significant reduction in NMR with facility based care. A three tiered facility based neonatal care was started in India. Level I (NBSU), Level II Special Newborn Care Unit (SNCU) at the district hospital and Level III Neonatal NICU at medical colleges.<sup>[4]</sup> The SNCU at GMERS Medical College and General Hospital was established in 2011 as a joint venture of GOI, UNICEF and NHM (National Health Mission). SNCU at GMERS Medical College is an important tool to decrease NMR of Vadodara and thus Gujarat. Being part of the medical college, the catchment area is Vadodara district, neighboring districts of Anand, Chotaudepur and Bharuch. It is a 32 bedded Level 3 (SNCU), it provides services for advanced respiratory support like mechanical ventilation, surfactant administration, CPAP, as well as parenteral nutrition and management of sepsis, jaundice, low birth weight, prematurity and other neonatal conditions. Since the SNCU has been set up recently, there is lack of data regarding the profile of neonates admitted here. A review of the morbidity and mortality profile of sick newborns admitted to SNCU will help in analyzing problem areas and developing policies for further decrease in the neonatal mortality in the institute as well as the state. Therefore a retrospective study was carried out to study the profile of newborns admitted in SNCU over a 2 year period (January 2016-December 2017).

## 2. Objectives

To study the morbidity and mortality profile of newborns admitted to the Special Newborn Care Unit at GMERS Medical College and Hospital, Gotri, Vadodara.

## 3. Material and Methods

The study was carried out at the Special Newborn Care Unit (SNCU), Department of Pediatrics, GMERS Medical College. The SNCU has total 32 beds. It is equipped with 32 radiant warmers, 21 phototherapy units, 5 bubble CPAP and 5 mechanical ventilators. Hospital stay, drugs and investigations are provided free of cost to all babies admitted in SNCU under JSSK and SNCU grant. The study was carried out over a period of 2 years (January 2016- December 2017). In this retrospective study, data of all neonates (0-28 days) admitted to SNCU was reviewed. Data was collected from the SNCU records and entered and analyzed using Microsoft Excel Worksheet.

## 4. Results

Baseline characteristics of the neonates: 2053 neonates were admitted over a period of 2 years out of which 1125 (54.8%) were males and 925(45.2%) were females. Intramural admissions were 998(48.7%) and out born admissions were 1055(50.2%). On applying one sample Chi-square test for seeing the observed frequency distribution in males and females overall admitted neonates at the SNCU, it was found to be significant (P is 0.001).

Age and gestation of neonates in SNCU: The neonates were divided arbitrarily into different age and gestational groups (>2500gm, 2499gm to 1500 gm, 1500-1000 gm & <1000gm) and >42 weeks, 37-42 weeks, and < 37 weeks) as the management, complications and prognosis of each group is different. 34% of the neonates admitted in the SNCU weighed more than 2500, 48% were low birth weight, 300(4.6%) were VLBW were 698(34%). The total number of preterm babies admitted was 50.35%.

Morbidity profile of admitted neonates: The chief causes of admission in SNCU were jaundice 34%, followed by Prematurity 16%, RDS 11.5%, perinatal asphyxia 12% and prematurity 16.8%. Congenital anomalies were reported in 2.3%.

Outcome of admitted neonates: Of all neonates admitted in SNCU, 71.9% survived. The percentage of the admitted neonates who went on leave against medical advice (LAMA) was 8.9% and 18% neonates succumbed.

Mortality profile of neonates: The major causes of death in this study in decreasing order are sepsis 27.7%, perinatal asphyxia 23.8%, and RDS 20.6%.

## 5. Discussion

All tertiary care NICU cater to substantial inborn and outborn newborn admission load. The ratio of intramural to extramural admission rates is 1.03:1. In this study, we observed that higher percentage of males were admitted which may be due to increased emphasis on health intervention for male child versus female child.

The incidence of low birth weight was 48.3, ratio being 1:1.4. Similar incidence was found in study in NICU at Bhopal and South India. <sup>[5,6]</sup> It is higher as compared to average incidence of LBW (30%) in India. This can be explained by higher number of Preterm deliveries 37.2%, institute being a tertiary care center and catering to high risk deliveries. The incidence of sepsis was 9.6% which is at par with other SCNUs<sup>[5-6]</sup> but mortality was highest in this group. Mortality was highest due to Sepsis followed by birth asphyxia <sup>[6-8]</sup> mortality can be reduced substantially if we focus on effective disinfection in hospital settings and hygiene practices as part of Essential Newborn Care in community. Sepsis, Prematurity and Low Birth Weight, Perinatal Asphyxia, and Respiratory Distress remain significant causes for morbidity and mortality in newborn.

Survival rate in our study was 71% which is comparable with outcomes in NICUs of Maharashtra and Karnataka also. <sup>[9-10]</sup>

## 6. Conclusion

Birth asphyxia, sepsis and preterm RDS are the leading causes of mortality in our study which can be prevented. Effective interventions are in place in form of NSSK, IMNCI, FIMNCI and ENBC program for training in resuscitation and management of sick and low birth weight newborn.

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**Table 1. Baseline characteristics of newborns admitted in SNCU from January 2016 to December 2017 (N=2053)**

<b>Admissions</b>	
Intramural –inborn	998 (48.6%)
Outborn	1055 (50.2 %)
<b>Gender</b>	
Male	1125 (54.8%)
Female	925 (45.1%)
Ambiguity	3(0.1%)
<b>Weight on admission (gms)</b>	
>2500	698 (34%)
<2500	992 (48.3%)
<1500	300 (4.6%)
<1000	63 (3.1%)
<b>Maturity (weeks)</b>	
<37 Weeks	763 (37.2%)
<37-42	1278 (62.3%)
>42	12 (0.6%)

**Table 2. Indication for admission of newborns and final diagnosis at discharge**

<b>Indication for admission</b>	N=1512
Jaundice	712 (34.7%)
Birth Asphyxia	24 (12%)
Prematurity	344 (16.8%)
RDS	237 (11.5%)
LBW	128 (6.2%)
Refusal to feed	67 (3.3%)
<b>Final diagnosis at discharge</b>	N=1582
Neonatal Jaundice	712 (35%)
Sepsis	195 (9.6%)
RDS	203 (10%)
TTN	39 (1.9%)
MAS	71 (3.5%)
Preterm	186 (9.15%)
LBW	130 (6.4%)
CONG	46 (2.3%)

**Table 3. Outcome of admitted newborns and mortality profile of died newborns**

<b>Outcome</b>	N=2039
Refer	25 (1.2%)
Lama	187 (8.9%)
Expired	365 (18%)
Discharge	1462 (71.9%)
<b>Cause of Death</b>	N=365
Sepsis	101 (27.7%)
Birth Asphyxia	87 (23.8%)
RDS	75 (20.5%)
MAS	22 (6%)
Pneumonia	18 (4.9%)
Prematurity <28 week	14 (3.8%)
Cong.	11 (3%)