

ORIGINAL RESEARCH

Study of the Morbidity and Mortality Pattern in Neonatal Intensive Care Unit at a Tertiary Care among The Under Privileged Population in Attapadi, Kerala

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CONFLICT OF INTEREST

None

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ABSTRACT

Background: Newborns are one among the most vulnerable group and those from the under privileged area are especially so, because of the resource poor social settings, poor health infrastructure, poor transport facilities for sick babies and poor maternal nutritional status.

Giving proper care both antenatal and in neonatal period can definitely improve the morbidity and mortality among one of the most vulnerable set of social group and also awareness of morbidity and mortality rate will aid to provide proper planning, channeling and utilization of resources appropriately.

Aim: Study the morbidity and mortality patterns of under privileged patients from Attapadi admitted in to NICU of a tertiary care hospital in Kerala.

Materials and Methods: This hospital based retrospective study was carried out in the NICU of a tertiary care hospital in Malappuram district for a period of 2 years (April 2018- March 2020). After taking ethical permission from Institutional Ethical Committee and administrative permission from medical superintendent, medical files of the under privileged neonates from Attapadi were retrospectively reviewed. Inclusion criteria: All under privileged newborns (<28 days of life) from Attapadi admitted in to NICU for a period of 2 years (April 2018- March 2020). Exclusion criteria: (a) Babies who left the hospital against medical advice. (b) Neonates whose medical records were incomplete.

Results: Male (31) to female (33) ratio was 1:1.06, of the sixty four babies who were admitted in this hospital among the tribal population. Among the total number of admission 47 of them were preterm neonates and 17 were term neonates. The chief causes of admission in NICU were Low birth weight (87.50%), Prematurity with Respiratory distress syndrome (43.75%) followed by Hypoglycemia (18.75%), sepsis (18.75%), Birth asphyxia (12.50%), Seizures (6.25%), Meconium aspiration syndrome (1.57%) and others (9.38%). Out of the 4 deaths, 3 deaths occurred in babies weighing less than 1000g and one death was in less than 1500g. Mortality was noted only among preterm babies.



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INTRODUCTION

The perinatal and neonatal period, in spite of the shortness is considered as most critical phase of life. It determines the general health and development of the child. Neonates are vulnerable and fragile beings more so if they come from resource poor settings. Many of them would fall sick despite adequate precautions and care. The early identification of serious illness and interventions are key factors in reducing neonatal mortality and morbidity. Out of the total number of neonatal deaths majority arise in low and middle income countries. About 2.4 million babies have died in 2019 globally in the first four weeks of life (approximately 6700 deaths/day) of which one fifth occurred in India.¹ Global neonatal mortality rate (NMR) was 17/1000 live birth and in India 21.7/1000 live births in 2019.² The major direct causes of the neonatal deaths were preterm birth, low birth weight babies, infections and asphyxia. According to the SRS statistical report the neonatal mortality rate in India has declined from 28 in 2013 to 23 as the current NMR and the target is to reduce it to 16 by 2025.³

The neonatal mortality rate in Kerala is 5/1000 live birth as per 2018 data mentioned in (Figure 1) above, which is far less than that of national figure but still scope of improvement in rural area especially places like Attapadi by increasing health infrastructures and good availability of transport facilities.

In a report which was published in The Lancet, the major direct causes of the deaths were preterm birth(27%), Infection(26%), asphyxia (23%), congenital anomalies(7%), others(7%), tetanus(7%) and diarrhea(3%).⁴

The main objective of this study was to assess the morbidity and mortality patterns in NICU at a tertiary care among the under privileged population of Attapadi, Kerala.

MATERIALS AND METHODS

This hospital based retrospective study was carried out in the NICU of a tertiary care hospital in Malappuram district for a period of 2 years (April 2018- March 2020). After taking ethical permission from Institutional Ethical Committee and administrative permission from medical superintendent, medical files of the under privileged neonates from Attapadi were retrospectively reviewed.

Neo-Natal Mortality Rates and percentage share of Neo-Natal Deaths to Infant Deaths by residence, India and bigger States, 2018

India and Bigger States/UTs	Neo-natal mortality rate			Percentage of Neo-natal deaths to Infant deaths		
	Total	Rural	Urban	Total	Rural	Urban
India	23	27	14	71.7	74.4	60.1
Andhra Pradesh	21	25	10	70.8	77.5	46.0
Assam	21	22	12	51.4	51.0	60.3
Bihar	25	26	20	78.7	80.1	66.3
Chhattisgarh	29	30	22	70.1	71.3	63.8
Delhi	10	8	10	74.8	100.0	74.4
Gujarat	19	24	11	69.2	74.7	55.2
Haryana	22	24	16	72.5	75.1	65.9
Himachal Pradesh*	13	13	9	68.4	68.6	63.4
Jammu & Kashmir	17	18	14	75.4	76.3	71.7
Jharkhand	21	22	14	68.0	71.2	52.6
Karnataka	16	20	10	70.6	80.2	49.9
Kerala	5	6	4	73.1	69.5	79.5
Madhya Pradesh	35	38	23	71.8	73.4	63.1
Maharashtra	13	18	8	68.4	74.2	55.6
Odisha	31	33	22	79.4	80.2	72.5
Punjab	13	13	11	61.2	62.4	59.2
Rajasthan	26	29	15	70.6	72.8	59.4
Tamil Nadu	10	14	6	65.3	76.2	50.8
Telangana	19	21	14	69.7	70.1	68.9
Uttar Pradesh	32	34	21	73.2	75.8	60.9
Uttarakhand	22	23	21	73.2	73.3	73.1
West Bengal	16	17	12	72.3	75.8	59.6

*Based on three-year period 2016-18

Figure 1. Neonatal mortality rates and percentage share of neonatal deaths to Infant deaths, India and Bigger states, 2018

Inclusion criteria: All under privileged newborns (<28 days of life) from Attapadi admitted in to NICU for a period of 2 years (April 2018- March 2020).

Exclusion criteria: Neonates whose medical records were incomplete.

Definitions used for various categorization are:

Underprivileged – Newborns born to tribal mothers.

Preterm- Live born newborn delivered before 37 weeks of gestation.

Lowbirth weight (LBW)- Any newborn with a birth weight of less than 2500gms.

Very low birth weight (VLBW)- Any newborn with a birth weight of 1000g to 1499gms.

Extremely low birth weight (ELBW)- Any newborn with a birth weight of less than 1000gms.

Neonatal infections which includes sepsis, pneumonia, meningitis these were diagnosed on clinical grounds and supported with appropriate investigations.

Table 1. Sex distribution of the babies admitted to NICU

Sex	Number of babies
Male	31
Female	33

Neonatal hypoglycemia is defined as plasma glucose level less than 30mg/dl in the first 24 hours of life and less than 45 mg/dl thereafter in the newborn period.

Meconium aspiration syndrome (MAS) was diagnosed based on history of meconium stained amniotic fluid, clinical findings and radiography.

Neonatal jaundice was diagnosed after assessment of serum bilirubin and considering the gestational age and weight.

RESULTS

A total of 64 tribal newborns were admitted into the NICU during the period of April 2018 to March 2020, of these 64 newborns the ratio of male (48.4%) and female (51.56%) neonates was 1:1.06 (**Table 1**).

The gestational age distribution of newborns admitted to NICU is shown in **Table 2**. Most of the newborns admitted into NICU weighed less than 2500g (87.5%) and constitutes of preterm babies (73.4%) than term babies (**Table 3**).

The chief causes of admission in to our NICU were low birth weight and respiratory distress syndrome, followed by neonatal infections, hypoglycemia, birth asphyxia, HIE, neonatal seizures, congenital heart diseases, meconium aspiration syndrome and others conditions like apnea, congenital anomalies constitutes the minority (**Table 4**).

Out of the 64 newborns admitted to our NICU, 60 neonates survived and were discharged as healthy babies and 4 deaths were reported (**Table 5**). Out of the 4 deaths, 3 neonates belonged to extremely low birth weight (<1000g) and one belonged to very low birth weight (<1500g). All of them were preterm babies.

DISCUSSION

Out of the study group 14 of the neonates were out born who were transported from the local tribal specialty hospital to our

Table 3. Distribution of neonates admitted to NICU according to birth weight

Weight (kg)	Number of babies	Percentage
<1	7	10.93
1-1.5	17	26.56
1.5-2	23	35.94
2-2.5	9	14.06
>2.5	8	12.50

Table 2. Gestational age distribution of newborns admitted to NICU

Gestational age (weeks)	Number of babies	Percentage
<28	4	6.25
28-37	43	67.19
>37	17	26.56

center by ambulance along with accompanying staff nurses whose accurate temperature recordings were unavailable.

In our study group male: female ratio is 1:1.06, showing that there is not much gender bias present in Kerala, particularly Attapadi. This is not in concordance to National neonatal perinatal Database (NNPD) and other studies of rural India, where male children are given more care or a greater tendency of male children to face neonatal complications.⁵ In our study the commonest causes of admission were low birth weight (87.50%), respiratory distress (Hyaline membrane disease contributing 43.75% and other causes 7.81%), hypoglycemia (18.75%), sepsis (18.75%), other causes like birth asphyxia & HIE (12.50%), Neonatal seizures(6.25%), congenital heart disease(3.13%) and meconium aspiration(1.57%). Birth asphyxia is an important cause of neonatal morbidity and mortality. The incidence of moderate to severe grade birth asphyxia with HIE was observed in 12.50% neonates in the present study, less than finding of Manikant et al. (18.20%).⁶

In our study prematurity and low birth weight babies were the only one those expired. Out of 64 neonates admitted to NICU, 4 neonates expired of which 3 neonates belonged

Table 4. Morbidity profile of the neonates in NICU

Type of Morbidity	Number of cases	Percentage
LBW	56	87.50
Respiratory distress syndrome/HMD	28	43.75
Hypoglycemia	12	18.75
Sepsis	12	18.75
Birth asphyxia & HIE	8	12.50
Others(apnoea, congenital anomalies etc.)	6	9.38
Respiratory distress (other cause)	5	7.81
Neonatal seizures	4	6.25
Congenital heart disease	2	3.13
Meconium aspiration	1	1.57

*Multiple morbidities were present in several babies

Table 5. Survival outcome of the admitted neonates at the NICU

Weight (kg)	Number of babies	Percentage
Outcomes	Number of cases	Percentage
Discharged	60	93.75
Death	4	6.25

to extremely low birth weight (<1000g) and one belonged to very low birth weight (<1500g). Our study also showed that the factors contributed to mortality were prematurity (gestational age < 32 weeks) (Table 2), Low birth weight (birth weight < 1500g), Respiratory distress syndrome and sepsis. Among the four neonates that expired three of them had sepsis as a contributing factor along with other causes. One of the baby in our study expired also had birth asphyxia as a contributing cause for mortality. Yasmin et al from Bangladesh also reported that very low birth weight and lower gestational age (<32 weeks) carried a high mortality risk.⁷

CONCLUSIONS

Low birth weight, prematurity, respiratory distress syndrome, hypoglycemia, sepsis, birth asphyxia, congenital heart disease, meconium aspiration syndrome were the major causes of morbidity. Prematurity and respiratory distress syndrome being the main contributors of death. Hence, attempts to prolong the pregnancy each week might improve the neonatal outcome considerably.⁸ Overwhelming number of low birth weight babies in this study group points to the need for improvement in antenatal care, maternal nutrition to reduce low birth weight, improving transportation of sick newborns or high risk pregnant ladies as early as possible to a tertiary care centre, improving local health infrastructure will aid to reduce neonatal morbidity and mortality in the underprivileged population.

All the neonates in our study group was treated under the government sponsored Attapadi comprehensive health care project.

LIMITATION

As we conducted a retrospective study the cause of death was determined by extent and depth of information in the official medical records. As it was a hospital based study among the tribal population, only those admitted into hospitals were included so the result of the study may not reflect the true burden which is prevalent in the underprivileged population. Maternal factors contributing for the neonatal morbidity were not studied in the present study.

REFERENCES

1. WHO. Newborns: improving survival and well-being [Internet]. [cited 2022 May 9].
2. India Neonatal mortality rate, 1960-2021 - knoema.com [Internet]. Knoema. [cited 2022 May 10].
3. Child Health :: National Health Mission [Internet]. [cited 2022 May 10].
4. Lawn JE, Cousens S, Zupan J, Lancet Neonatal Survival Steering Team. 4 million neonatal deaths: when? Where? Why? Lancet. 2005 Mar 5;365(9462):891–900.
5. Roy RN, Nandy S, Shrivastava P, Chakraborty A, Dasgupta M, Kundu TK. Mortality pattern of hospitalized children in a tertiary care hospital of kolkata. Indian J Community Med. 2008 Jul;33(3):187–9.
6. Mani Kant Kumar, Sachida Thakur, BrishBhanu Singh. Study of the Morbidity and the Mortality Patterns in the Neonatal Intensive Care Unit at a Tertiary Care teaching Hospital in Rohtas District, Bihar, India. Journal of Clinical and Diagnostic Research 2012;6(2):282-5.
7. Yasmin S, Osrin D, Paul E, Costello A. Neonatal mortality of low-birth-weight infants in Bangladesh. Bull World Health Organ. 2001;79(7):608–14.
8. Rohit M, Bhavesh M, Patel Jaiminkumar P, Punitha K. Study of the Morbidity and the Mortality Pattern in the Neonatal Intensive Care Unit at a Tertiary Care teaching Hospital in Gandhinagar District, Gujarat, India. J Res Med Den Sci. 2015;3(3):208.