International Journal of Contemporary Pediatrics
Jeganathan S et al. Int J Contemp Pediatr. 2017 Mar;4(2):399-402
http://www.ijpediatrics.com
pISSN 2349-3283 | eISSN 2349-3291
DOI: http://dx.doi.org/10.18203/2349-3291.ijcp20170536

Original Research Article

Neonatal mortality of sick newborns admitted in a tertiary care teaching hospital in Tamil Nadu, South India

Sathya Jeganathan[1]*, Rsavikmar S. A.[1], Tamilmani A.[2], Parameshwari P.[2]
Asvatha Valarmathi Chinnarajalu[2], Yalaguraswami B. Kolkar[2]

[1]Department of Pediatrics, [2]Department of Community Medicine, Chengalpattu Medical College, Dr. M.G.R. Medical University, Tamil Nadu, India

Received: 21 January 2017
Accepted: 07 February 2017

***Correspondence:**
Dr. Sathya Jeganathan,
E-mail: sathyaj65@gmail.com

ABSTRACT

Background: Neonatal period is an important period in the life where most of the deaths are preventable. In India every year 1 million babies die, which contributes to 25% of the world neonatal mortality. Perinatal death is very high in developing countries including India.
Methods: A record based retrospective study was conducted in the Neonatal Intensive care unit(NICU) of Department of Pediatrics, Chengalpattu Medical College in Tamil Nadu, South India. The records were collected for the period of one year from January 2016 to December 2016. All the neonates admitted in the NICU during this period were included in the study.
Results: The number of total deliveries in Chengalpattu Medical College for the year 2016 was 9339. Total number of live births was 9170 of which 21.88% were low birth weight and 15.96% were preterm delivery. Mortality rate in males is 3.2% (54/1689) and mortality rate in female is 3.98% (55/1383). The difference in mortality rate among male and female neonates was not significant. Respiratory distress syndrome and prematurity related illness contributed to 45% of the total neonatal deaths (39/110). Birth asphyxia and meconium aspiration contributed to 23.6 % (24/110). Rest of the mortality was contributed by ELBW 11.8% (13/110), major congenital malformation 6.4% (7/110), sepsis 1.8% (2/110) and others.
Conclusions: Prematurity related problems and respiratory distress are the leading causes of neonatal mortality and morbidity followed by birth asphyxia in CMCH. Proper identification and management of pre-eclampsia, prevention of preterm and low birth weight deliveries are the need of the hour to reduce the mortality and morbidity among neonates.

Keywords: Neonatal mortality, Preterm birth asphyxia

INTRODUCTION

Neonatal period is an important period in the life where most of the deaths are preventable. In India every year 1 million babies die, which contributes to 25% of the world neonatal mortality.[1,2] Perinatal death is very high in developing countries including India.[3] Current neonatal mortality rate is 29.5/1000 live births as per UNICEF statistics. Preterm and low birth weight are at increased risk of morbidity and mortality.[4,5] As per Lancet publication major cause of neonatal mortality are preterm infection and asphyxia.[6] Currently in India various interventions are done through National Rural Health Mission and National Health Mission. Interventions are done to increase the transport of mothers and neonates to the sick newborn care units in district hospitals and

tertiary care hospitals. This study was undertaken to analyze the mortality pattern in neonates admitted to the neonatal intensive care unit of Chengalpattu medical college hospital, located in Tamil Nadu, South India.

METHODS

A record based retrospective study was conducted in the Neonatal Intensive care unit (NICU) of Department of Pediatrics, Chengalpattu Medical College in Tamil Nadu, South India. The records were collected for the period of one year from January 2016 to December 2016. All the neonates admitted in the NICU during this period were included in the study. NICU of Chengalpattu Medical College is a tertiary and referral center covering the population from Kanchipuram and other neighboring districts like Villupuram and Thiruvannamalai. All the information of the neonates were collected from the records from the labour room and neonatal intensive care unit. There were 9170 live births and 110 deaths were recorded in the year 2016 (Jan-Dec). The mortality factors based on gestation age, sex, maturity, weight, duration of stay and the age at admission were recorded. The data was entered, compiled in excel and further analyzed using Epi info 7 software.

RESULTS

The number of total deliveries in Chengalpattu Medical College for the year 2016 was 9339. Total number of live births was 9170 of which 21.88% were low birth weight and 15.96% were preterm delivery. The total Number of neonatal death was 110 (12%), death among intramural deliveries was 81 out of 9170 live births.

Table 1: Mortality profile of neonates based on gestation age and sex of the baby.

	Admission (%) (N = 3073)	Died (%) (N = 110)	Crude odds ratio	95% CI	P value
Gestation age					
<34 weeks	307 (9.99)	51 (16.61)	0.13	(0.86,0.18)	<0.0001
>34 weeks	2766 (90.09)	59 (2.1)			
Gender					
Male	1689 (55.00)	54 (3.2)	1.25	(0.85,1.83)	0.2477
Female	1383 (45.00)	55 (3.98)			

Table 2: Mortality profile of neonates based on weight and maturity of the baby.

	Admission	Died	Crude odds ratio	95% CI	P Value
Weight of baby					
<2500 gm	1238 (40.28)	75 (68.18)	3.18	(2.11,4.77)	<0.0001
>2500 gm	1835 (59.72)	35 (31.82)			
Maturity					
Preterm	828 (26.93)	71 (64.55)	0.20	(0.13,0.30)	<0.0001
Full term	2245 (73.07)	39 (35.45)			

Table 3: Mortality profile of neonates based on age of admission and duration of stay of the baby.

	Admission	Died	Crude odds ratio	95% CI	P value
Age on admission					
Less than 7 days	2900 (96.51)	105 (3.49)	0.8	(0.32,2.06)	0.646
More than 7 days	173 (97.16)	5 (4.55)			
Duration of stay					
Less than 7 days	2081 (67.71)	95 (4.55)	0.3	(0.18,0.56)	0.002
More than 7 days	992 (32.28)	15 (1.51)			

The neonatal mortality at CMCH is 8.8 per 1000 live births. A total of 3073 newborn were admitted in neonatal intensive care unit of Chengalpattu Medical College during the period of January - December 2016. Out of the 3073, a total of 2431 (79.15%) were intramural delivery and 640 (20.85%) were extramural delivery. Mortality rate in males is 3.2% (54/1689) and mortality rate in female is 3.98% (55/1383), the difference in mortality rate among male and female neonates was not significant (p = 0.25). Among the neonates admitted in NICU 307 were less than 34 weeks of gestational age and mortality among this group is 16.6% (55/307). 2766 were more than 34 weeks of gestational age, and the mortality among this group was 2.1% (59/2766). The difference in

mortality rate was significant (p <0.0001) (Table 1). Among the total admissions 1238 were low birth weight babies and the greater proportion of mortality is contributed by low birth weight (75/1238) (p <0.0001). 828 neonates were preterm gestation and 8.5% (71/828) died in NICU. The mortality among the term neonates was significantly less 1.7% (39/2245) (p <0.0001) (Table 2). The age on admission to NICU was analyzed. Among the total admissions two thirds (1934) were in the first 24hours of life. The mortality was greater within first 24 hours, 1/3rd (11/38) of the neonates died within first day of life. 8% Died within first 72 hours of life (69/854). Babies who died beyond 1st week was significantly less-1.5% (15/992) p <0.002 (Table 3).

The place of delivery and the mortality among NICU admissions was studied. The results showed admissions were high from the government hospitals (80%), 2463/3073. From the surrounding primary health centers 12% (362/3073), Taluk district hospital 2.6% (79/3073), private hospitals 1.8% (57/3073) were admitted to NICU. 1% of neonates were delivered during transport or at home (31/3073). From the private hospitals 57 neonates were transferred of which 8.8% (5/57) died. The mortality is high among the neonates delivered at home (3/18) 16.6% and born during transport (2/13) 15.38%. The mortality is less among babies born in medical college hospital, 3.45% (85/2463) (Figure 1).

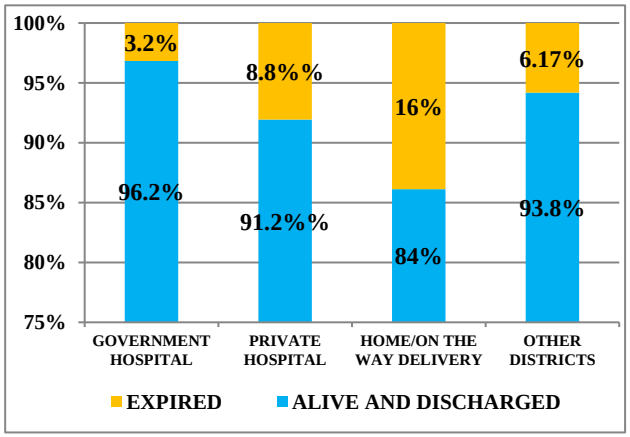

Figure 1: Mortality profile of neonate based on place of delivery.

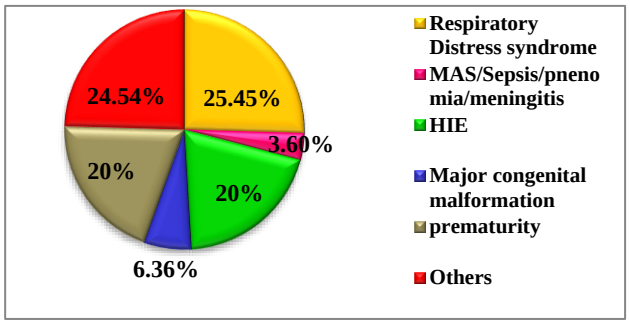

Figure 2: Cause of death of the neonates admitted in NICU.

DISCUSSION

This study was conducted to assess the outcome pertaining to the mortality in neonates admitted to the NICU of a tertiary care teaching hospital. In our study, total of 3073 neonates were admitted of which 2431 (79%) were inborn and the rest were outborn (21%). Male preponderance was seen with regard to NICU admissions as per studies done in other parts of India Sridhar et al and Roy et al.[1,2,7]. But in our study, there was no significant difference between admissions and mortality pattern with regard to gender. This may probably be due to, nearly 80% of the neonates being delivered in the medical college and they were admitted to the NICU immediately.

According to the report by UNICEF "The state of the world's children 2010", 28% of neonates born in India are low birth weight. Our study shows 40% of admissions to NICU were LBW babies. Mortality rate observed in our study is 3.6% of the total admissions in NICU. Mortality rate is lower when compared to the study by Rakholia et al and Sridhar et al.[1,9]

The study report by ICMR states that sepsis is the major cause 32.8 % followed by birth asphyxia and prematurity 16.8%.[10] The study done in one of the tertiary care centers in south India in JIPMER states that sepsis (52.3%) followed by birth asphyxia and injuries as the major cause of mortality.[11] The study by national neonatal-perinatal database (NNPD) states that sepsis (36%) is the most common morbidity responsible for admission followed by prematurity (26.5%) and perinatal asphyxia (10%).[12] In our study respiratory distress syndrome and prematurity related illness contributed to 45% followed by birth asphyxia and meconium aspiration syndrome 23.6% and major malformation 6.4%. Sepsis contributed less compared to other studies which were only 1.8%. Similar pattern of high mortality due to respiratory distress syndrome was noted by Sridhar et al and Rashid et al.[1,13]

CONCLUSION

Prematurity related problems and respiratory distress were the leading causes of neonatal mortality and morbidity followed by birth asphyxia. Various interventions have been implemented by the state and central government to improve the perinatal care. Incentives to improve maternal health in the antenatal period, facility for transport of mother and newborn, establishment of SNCU's with facility for surfactant administration and ventilator care are available at present in the state of Tamil Nadu but still low birth weight and preterm needs special attention in terms of better utilization of services. Improvement of socioeconomic status with proper identification and management of pre-eclampsia, prevention of preterm and low birth weight are the need of the hour to reduce the mortality and morbidity.

This study has some limitations. This is a hospital based study where the cause of death was analyzed as a single primary indicator for death. Other comorbidities contributing to death were not analyzed.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Sridhar PV, Thammanna PS, Sandeep M. Morbidity pattern and hospital outcome of neonates admitted in a tertiary care teaching hospital, Mandya. Int J Sci Stud. 2015;3(6):126-9.
2. Prasad V, Singh N. Causes of morbidity and mortality in neonates admitted in Government Medical College, Haldwani in Kumaun region (Uttarakhand) India. JPBS. 2011;8:1-4.
3. Bhutta ZA. Priorities in newborn management and development of clinical neonatology in Pakistan. J Coll Phys Surg Pak. 1997;7:231-4.
4. UNICEF Annual Report 2012 for India, ROSA. Available at https:// data.unicef. org/country/ind/ Accessed on 12 January 2017.
5. NFHS-3: Ministry of Health and Family Welfare, Government of India. Available at http:// www.mohfw.nic.in/NFHS-PRESENTATION.htm. Accessed on 12 January 2017.
6. Lawn JE, Cousens S, Zupan J, Lancet neonatal survival steering team. 4 million neonatal deaths: When? Where? Why? Lancet. 2005;365:891-900.
7. Roy KK, Baruah J, Kumar S, Malhotra N, Deorari AK, Sharma JB. Maternal antenatal profile and immediate neonatal outcome in VLBW and ELBW babies. Indian J Pediatr. 2006;73:669-73.
8. UNICEF. The State of The World's Children, 2010. New York: UNICEF; 2010:92-5.
9. Rakholia R, Rawat V, Bano M, Singh G. Neonatal morbidity and mortality of sick newborns admitted in a teaching hospital of Uttarakhand. Chrismed J Health Res. 2014;1:228-34.
10. ICMR young infant study group. Age profile of neonatal deaths. Indian Pediatr. 2008;45:991-4.
11. Augustine T, Bhatia BD. Early neonatal morbidity and mortality pattern in hospitalised children. Indian J Matern Child Health. 1994;5:17-9.
12. Morbidity and mortality among outborn neonates at 10 tertiary care institutions in India during the year 2000. J Trop Pediatr. 2004;50:170-4.
13. Rashid A, Ferdous S, Chowdhury T, Rahman F. The morbidity pattern and the hospital outcome of the neonates who were admitted in a tertiary level hospital in Bangladesh. Bangladesh J Child Health. 2003;27:10-3.

Cite this article as: Jeganathan S, Ravikmar SA, Tamilmani A, Parameshwari P, Chinnarajalu AV, Kolkar YB. Neonatal mortality of sick newborns admitted in a tertiary care teaching hospital in Tamil Nadu, South India. Int J Contemp Pediatr 2017;4:399-402.