Neonatal Morbidity and Mortality of Low-Birth-Weight Neonates Admitted to a Tertiary Care Hospital

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Abstract

Low birth weight (LBW) has been defined as a birth weight of less than 2.5 kg. Around one fourth of all neonates born in India are low birth weight. The present study was undertaken to find out the clinical profile and outcomes of neonates admitted with Low birth weight in a tertiary care hospital in Suburban parts of Chennai. This was a retrospective study where the obstetrical and perinatal records in a hospitals obstetrics and neonatal database between 2018 and 2019 were studied after approval from the Institutional Review Committee. Data were collected and entered in a predesigned proforma. A total of 142 Low birth weight neonates were admitted during the study period. Among them 47 % of the neonates were female and 53 % were male neonates. The mean gestational age was 33 weeks and 5 days and mean weight was 1867grams. Majority of the neonates were appropriate for gestational age (75%) rest were small for gestational age(25%). Neonatal jaundice was the most common morbidity accounting for 68 %While RDS (44%), TTNB (32%), PDA (20%) were other morbidity patterns noted. The mean duration of hospital stay was 23days.Neonates are at higher risk of morbidities and mortalities. The major determinant for mortality in LBW babies is the birth weight. The best option to prevent LBW is by improving maternal health. Improvement of perinatal and neonatal services plays a key role in reducing the morbidity related to low birth weight.

Keywords:Low birth weight, Respiratorydistress,Preterm,Small for gestational age, Neonataljaundice.

Introduction

Low birth weight has been defined as a birth weight of less than 2.5 kilogram regardless of gestational age [1]. More than 20 million infants worldwide are born low birth weight constituting almost 20 % of all live births. Majority of them are born in developing countries like India. The incidence of low birth weight in developing countries (16.5 per cent) is more than double the incidence in developed regions (7 per cent). In India, nearly 8 million babies are born with a low birth weight every year [2]. In India almost 26 % of all neonates born are low birth weight. Birth weight is a strong indicator not only of a mother's health and nutritional status but also a new-born's chances for survival, growth and long-term growth and development. ELBW and VLBW neonates are of major concern because of The significant mortality associated with them [3,4]. It would also be an important factor in achieving the INAP goal [5].

Methods: A cross-sectional study was carried out using a database obtained from the obstetrical and neonatal information in Saveetha Medical College and Hospital, a referral maternity hospital for the region in Kancheepuram, Tamil Nadu. Obstetrical and Neonatal information system records all data collected during hospitalisation in SMCH and this database contains information from the beginning of ante-natal care through the postpartum period, including demographical information, reproductive history, characteristics of pre-natal care, management of delivery, maternal complications during delivery, delivery and puerperium, as well as neonatal information. This clinical information is originally collected in a paper-based neonatal case form, which is filled by the clinicians in charge and is ended at the hospital discharge of the woman. After that, the data in the form is checked against the medical records by a medical supervisor. This data is then entered into an electronic database by trained clerical staff and then submitted to consistent tests and corrections if necessary.

Data of all low-birth-weightneonates (< 2500 grams at birth) admitted between 2018 to 2019 were collected after taking approval from the institutional review committee (IRC) of the college. The present study included allow birth weight neonates born during the study period.

Low birth weight is defined as birth weight less than 2500 grams at birth. This group includes both preterm babies and small for gestational age babies. The morbidity pattern, demographic characteristic was collected and entered in the predesigned proforma. Relevant investigations report like full blood count, C-reactive protein, blood glucose, blood cultures, blood gases, chest x-ray were also studied. In case of death, the cause of mortality was recorded.

Data was checked for any errors or inconsistencies, then entered in Microsoft Excel sheets and analysed using Statistical Package for Social Sciences (SPSS) version 25.0.

Results:

A total of 142 low birth weight neonates were admitted during the study period. Of them 67 were female and 75 were male neonates. The mean Gestational age was 33weeks and 5 days and mean weight was 1867 grams. Among the neonates 106 (75%) were appropriate for gestational age and rest 36 (25%) were Small for gestational age. 79% of the neonates were born by Caesarean section (112) while19% were delivered by labour natural (30)

PATIENT CHARECTERISTICS	N(%)
MALE, n(%)	75 (53%)
FEMALE, n (%)	67 (47%)
WEIGHT g, mean (SD)	1867.69 (498.4)
GA weeks, mean (SD)	33.5 (3.1)
AGA, n (%)	106 (75%)
SGA, n (%)	36 (25%)
LGA, n (%)	0
LSCS, n (%)	112 (79%)
NVD, n (%)	30 (21%)

Table 1 Demographic data

Low birth weight classification and characteristics:

Among the Low birth weight neonates 127 were preterm neonates and 15 were term neonates.29 neonates were less than 1500 grams and 113 neonates were greater than 1500 grams but less than 2500 grams.12 neonates were of extremely low birth weight.13 neonates died during the hospital stay.

Low birth weight characteristics	N=142
Preterm	127 (89.43%)
Term	15 (10.57%)
<1500 grams	29 (20.42%)
<1000 grams	12(8.42%)
Death	13(9.%)

Table 2.Low birth weight Characteristics

Outcomes of low birth weight neonates:

Among the low birth weight neonates admitted in NICU 13 babies Died.129 neonates survived and were discharged.

The mean duration of hospital stay was 23 days

Neonatal OUTCOMES	n (%)
IVH	9 (6.3%)
SEIZURES	9 (6.3%)
ASPHYXIA	10 (7%)
ROP	43 (30%)

NNEC	1 (0.7%)
SURGERIES	1 (0.7%)
RDS	63 (44%)
TTN	46 (32%)
PNEUMONIA	15 (11%)
MAS	1 (0.7%)
PNEUMOTHORAX	1 (0.7%)
SEPSIS	16 (11%)
HYPOGLYCEMIA	0
HYPOCALCEMIA	0
NEONATAL JAUNDICE	96 (68%)
PDA	29 (20%)
CONGENITAL ANOMALIES	3 (2%)
LENGTH OF STAY, mean (SD)	23 (18.6)
MORTALITY	13 (9%)

Table3.Morbidity pattern among Low birth weight Neonates

Neonatal jaundice was the most common morbidity accounting for 68 % of admissions followed by Respiratory distress syndrome (44%) and Transient tachypnoea of neonate (32%).11% of the neonates developed sepsis during the hospital stay. Retinopathy of prematurity developed in 30 % of the neonates, this was possibly because of the high number of preterm neonates in the study population. Seizures and Intraventricular haemorrhage developed in 6.3 % of the neonates in the study population. Other complication noticed included PDA, Meconium aspiration and Pneumonia.

Mean duration of hospital stay was 23 days.

Discussion:

Low birth weight neonates (<2500 grams) are an important contributor to neonatal mortality and morbidity and a very important index of maternal and child health status of the country.[6] Our study was done to determine the morbidity and mortality pattern among low birth weight in our institute which is a tertiary care hospital catering sub urban population around Chennai.

During the study period out of 1286 deliveries and 322 NICU admissions of which 142 were Low birth weight neonates.The incidence of low birth was around 11.04 %.Which is slightly lesser than the overall incidence of low birth weight in our country .This is explainable as most of the mothers had antenatal visits and were monitored during the pregnancy.127 of the 142 neonates low birth weight were preterm neonates and they contributed significantly to the mortality also as most of the death were in neonates below 1500 grams with only one baby being more than 1500 grams. This is probably the reason for increased mortality noticed in our study compared to other studies.

A study done by Gupta MK et al found that 30% of the LBW infants presented with hyperbilirubinemia, 28.5% LBW infants presented with respiratory distress and 23.5% of LBW infants presented with septicaemia. These findings are not similar to our study probably because of the different pattern of the study population. In our study majority of the low birth weight was due to preterm neonates. This also explains the high number of neonates with respiratory morbidity and Retinopathy of prematurity. A study done by NaikeyM et al[8] found that majority (67%) of the LBW infants presented with neonatal sepsis, birth asphyxia, respiratory distress and hyperbilirubinemia. These findings are similar to our finding since the study population in that study was also predominantly Preterm neonates.

Several studies have been done looking at the epidemiological and maternal factors contributing to the aetiology of Low birth weight [9,10,11,12,13,14] in India .All these studies show findings which are similar to our study.

We had a significantly high mortality rate compared to the national average as the study population was high risk neonates. But compared to studies of mortality among low birth weight neonates our study shows a significantly lower mortality.

Conclusion:

Birth weight is considered as the single most crucial determinant of chances of survival, freedom from morbidity as well as healthy growth and development of a new-born. Magnitude of LBW is a sensitive indicator of public health. The immediate outcomes of low birth weight babies show that with good antenatal follow up and management of maternal complication like anaemia, Gestational diabetes and PIH can significantly reduce the morbidity associated with Low birth weight neonates. Modifiable risk factors like anaemia, low socioeconomic status ,antenatal care during pregnancy ,institutionalization of all deliveries could go a long way in reducing the incidence of Low birth weight[9,10,11,12]. Strategies addressing improvement of literacy level of the mothers thereby increasing utilization of the existing maternal health services and making sure that mothers at greater risk of delivering LBW babies receive appropriate care, may provide same opportunity to reduce LBW babies.[13,14]

References :

1. WHO Library Cataloguing-in-Publication Data. Guidelines on optimal feeding of low birth weight infants in low and middle income countries. World Health Organization, Geneva; 2011. Available at http://www.who.int/maternal_child_adolescent/docu ments/9789241548366.pdf

2. United Nations Children's Fund, WHO and UNICEF. Low birth weight: Country, Regional and Global estimates. Newyork: WHO and UNICEF; 2004. Available at https://www.unicef.org/publications/index_24840.ht ml

3. Bhargava SK, Singh KK, Saxena BN. ICMR Task Force National Collaborative Study on Identification of High Risk Families, Mothers and Outcome of their Off-springs with

particular reference to the problem of maternal nutrition, low birth weight, perinatal and infant morbidity and mortality in rural and urban slum communities. Summary, conclusions and recommendations. Indian Pediatr. 1991;28:1473-80.

4. Ahman E, Zupan J. WHO Library Cataloguing-inPublication Data. Neonatal and perinatal mortality: country, regional and global estimates 2004. Geneva: WHO;2007.

5. India Newborn Action Plan. Ministry of Health and Family Welfare, Govt of India 2014 Available at http://nhm.gov.in/india-newborn-action-plan.html

6. Kutubur Rahman, A R Bhuyan et al. Incidence and clinical profile of low birth weight babies: A rural tertiary care hospital based study. New Indian J OBGYN. 2015;2(1):43-45.

7. Gupta MK, Kakkar M, Sethi C, Malhotra AK. Pattern of morbidity and mortality in LBW neonates: a study from Jaipur. J Evol Med Dental Sci. 2014 Feb 10;3(06):1339-45.

8. Naikey M, Jayashree N, Santosh R. Clinico epidemiological profile of low birth weight babies. Nat J Med Dental Res. 2015:3(2):89-92.

9. Hirve SS, Ganatra BR. Determinants of low birth weight: a community based prospective cohort study. Indian Pediatr. 1994;31:1221-5.

10. Ferreira AMA, Harikumar P. Maternal determinants of birth weight. Indian J Comm Med. 1991;15:106- 9

11. Kumar MG, Munish K, Chirag S, Malhotra AK. Pattern of morbidity and mortality in LBW neonates: a study from Jaipur. J Evolution Med Dental Sci. 2014;10:1339-45.

12. Deshmukh SS, Motghare DD, Zodpey SP, Wadhva SK. A study of low birth weight and associated maternal factors in urban area. Indian Paediatr. 1998;35:7-10.

13. Anand K, Garg BS. A study of factors affecting low birth weight. Indian J Community Med. 2000;25(2):57-61.

14. Mavalankar DV, Gray RH, Trivedi CR. Risk factors for preterm and term low birth weight in Ahmedabad, India. Int J Epidemiol. 1993;21:263- 72