



A CLINICAL STUDY OF THE VARIOUS FACTORS PREDISPOSING TO LOW BIRTH WEIGHT IN NEONATES BORN IN A SECONDARY CARE HOSPITAL IN THE COASTAL UDUPI DISTRICT OF SOUTH INDIA

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ABSTRACT

Higher risk of infections, poor neurodevelopmental outcomes and morbidity is commonly associated with low birth weight (LBW) in neonates. Early identification of risk is an ongoing challenge for pediatricians. The current retrospective study screened 1232 neonates born over a period of one year in a secondary care hospital of south India. The study was designed to study the incidence, the causes and to profile the complications among the LBW neonates. 124 of the total neonates were having LBW and of these 74% were females. The mode of delivery was caesarean section for 46% in contrast to 5% in normal birth weight babies. The maternal age was between 26-30 years for 50% cases and 52% of LBW babies were the first child to be born and 96% were singletons. 50% LBW babies were born at term and for 94% of them, the APGAR score recorded at one minute was 7. Our study reveals that majority of the LBW neonates are females and the postnatal complications have been minimum. The incidence of LBW neonates is less compared to the data from other parts of India.

KEYWORDS: Low birth weight; maternal factors, incidence



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INTRODUCTION

Low birth weight (LBW) is an important determinant of childhood morbidity and mortality. It is also a subject of clinical and epidemiological investigations and a target for public health intervention¹. Low birth weight is defined as a neonate weighing less than 2,500 grams. Those that are born prematurely (before 37 weeks of gestation), are more apt to be characterized as low or very low birth weight neonates². These LBW babies are at a much higher risk for health problems throughout life. A study in 1960 indicated that mortality rates were more than 30 times as high as infants with an adequate birth weight³. The social factors associated with low birth weight and preterm births have been shown to be maternal age, education level, race, and socioeconomic status - all contributing to insufficient access to prenatal care. The risk factors for LBW are multifactorial. In 2013, nearly 22 million newborns, an estimated 16 percent of all babies born globally had low birth weight⁴. Highest incidence of low birth weight occurs in the sub- region of South-Central Asia, where 27 % of infants are low birthweight and among these countries India and Bangladesh has the highest prevalence of 30%⁴. In India, as many as 1.72 million children die annually before reaching their first birthday and, of these, 72% die during their first month of life, the neonatal period. The neonatal mortality rate varies by state but, overall, it is reported to be 39 per 1,000 live births in India⁵. The current study was designed to assess the prevalence and profile of the LBW neonates in our local area and compare it to the statistics in other available data from parts of India. The study was also designed to

understand the maternal history and to have a profile of LBW neonates exploring the causes and complications among them.

MATERIALS AND METHODS

The current retrospective study screened 1232 neonates born over a period of one year in a secondary care hospital. The study was designed to explore the incidence, the causes and to understand the complications among the LBW neonates. The study was done using hospital records of inpatient newborns in the Pediatrics Department of Dr. TMA Pai Hospital in the coastal Udupi district of south India. Relevant information were collected in a clinical proforma and the data was analyzed. A total of 124 neonates were found to have LBW. Maternal and neonatal data were analyzed using simple bar graphs and pie charts and was expressed as percentage. The privacy and the confidentiality of the subjects and mothers are protected. Patient data were accessed after obtaining Institutional Ethical committee approval for the current project.

RESULTS

Of the total 124 mothers studied, 32 of the mothers gave birth when they are 21-25 years old. 62 of them give birth when they are 26-30 years old and twenty-seven of them gave birth when they are 31-35 years old. And three of them gave birth when they were beyond 36 years of age. (Figure 1).

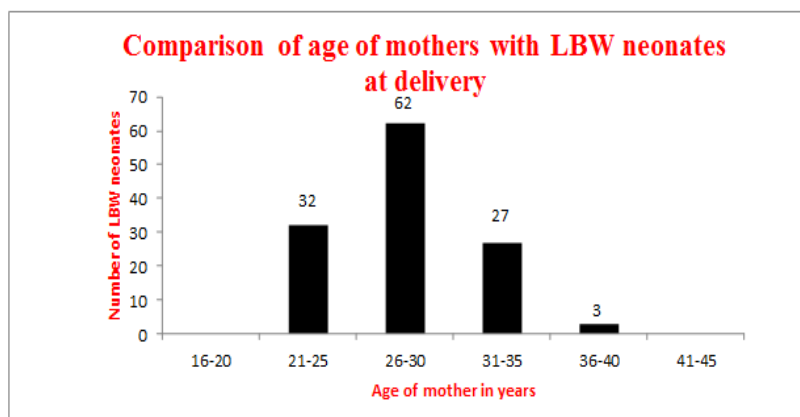


Figure 1
Comparison of maternal age with the incidence of delivery of low birthweight neonates.

Of the total 124 mothers, 54% of LBW neonates were born by normal vaginal delivery (NVD) and 46% of LBW neonates were born by lower segment caesarean section (LSCS). (Figure 2)

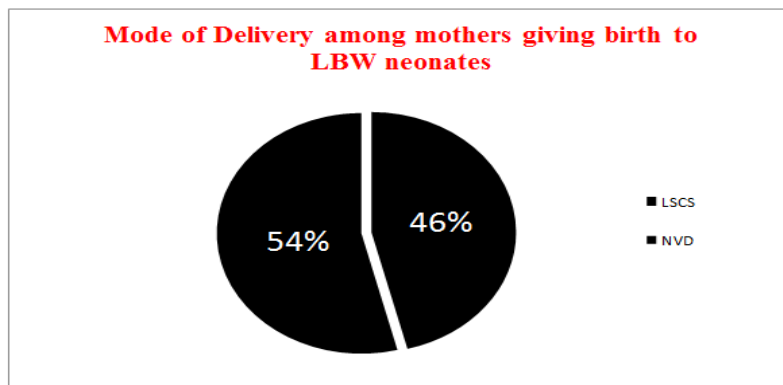


Figure 2
Comparison of the Mode of delivery with incidence of delivery of low birth weight neonates (LSCS-Lower segment caesarean section, NVD-Normal vaginal delivery).

Fifteen mothers had undergone an abortion. Five mothers out of the 124 underwent abortion twice. But most mothers i.e. 104 of them had no experience with any abortion. (Figure 3)

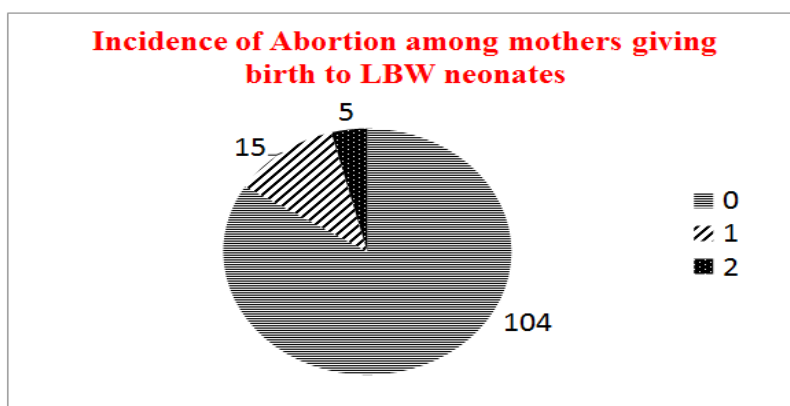


Figure 3
Comparison of the incidence of abortion with the incidence of delivery of low birth weight neonates.

Fifty eight percent of the LBW neonates were born at term and 42 % were born preterm. (Figure 4)

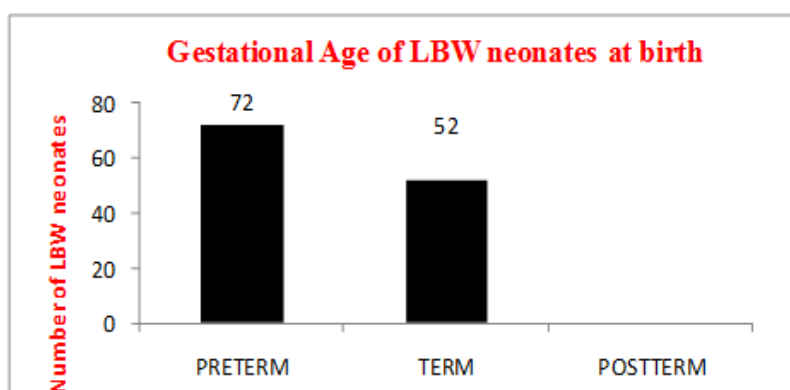


Figure 4
Comparison of Gestational age with the incidence of delivery of low birth weight neonates.

We observed that, premature rupture of membrane (PROM) and threatened abortion, were the common complications suffered by the mothers. Next to that were hypothyroidism, gestational diabetes mellitus (GDM), oligohydroamnios, and gestational hypertension. The maternal history for the remaining cases was not significant. (Figure 5)

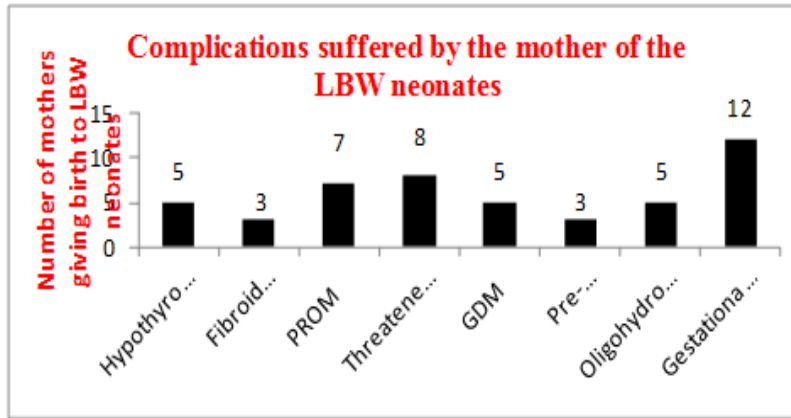


Figure 5
Profile of the complication borne by the mothers while bearing or before conceiving the LBW babies.

Out of 1232 neonates, 124 newborns were born weighting less than 2.5 kg . From the chart, it clearly shows that March (21) has the highest statistics. The second highest is in May (14) and April (5), having the least number of LBW neonates. While, astonishingly, in June, August and September, number of cases recorded were 7. (Figure 6)

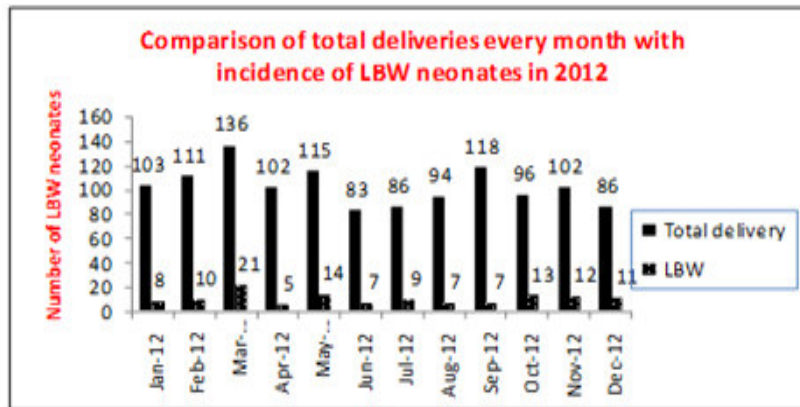


Figure 6
The incidence of LBW neonates born in 2012.

Out of the 124 LBW neonates, more than 92 of them are female whereas 32 of them were male. (Figure 7)

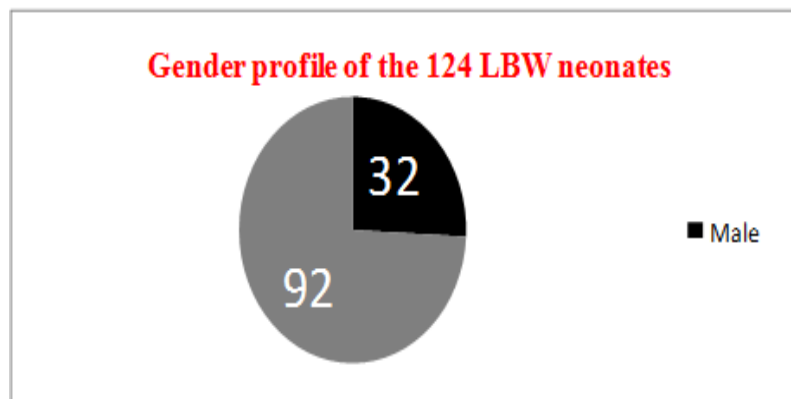


Figure 7
The profile of the gender of LBW neonates.

In our study, most of the neonates were having blood group O⁺ and A⁺. While, out of the 124 LBW neonates, none of them were having blood group A⁻ or B⁻. (Figure 8)

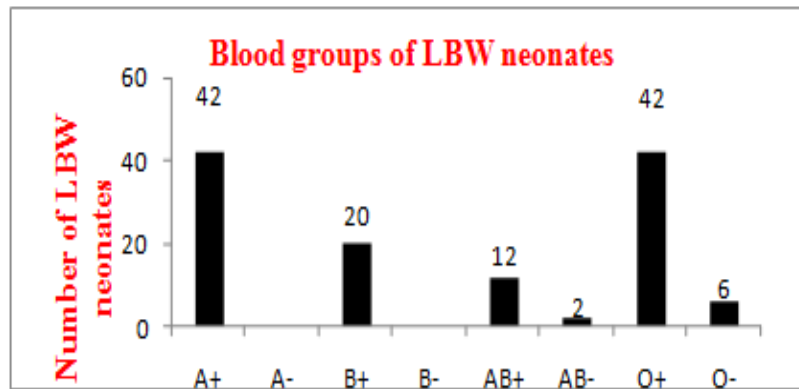


Figure 8
The profile of the blood groups of LBW neonates

Majority (64%) of the LBW neonates born had no major complications. 14% of them had neonatal jaundice, 6% of them had hypoglycaemia, 4% of them had sepsis, other complications were mild respiratory distress (2%), dental papillae (2%), hemorrhagic disease (2%), tachycardia (2%) and chorioamnionitis (2%) and neonatal seizures (2%). In our study, 94% of the LBW neonates had an APGAR score, more than 7 in one minute. While all of the LBW neonates scored more than 9 after 5 minutes. Out of the 124 LBW neonates, only five twins were present and rest were singletons. Almost 90% of the LBW neonates selected for the study had vertex presentation and the rest presented with breech.

DISCUSSION

The current study at our hospital revealed that the percentage of LBW babies in 2012 was 10.1%. In the other studies conducted in South India like in Vellore, Tamilnadu (2009 – 2010), Belgaum, Karnataka (2012 – 2013), the prevalence of low birth weight was 17% and 22.5 % respectively. Also in a study in Kuala Lumpur, Malaysia (Jan 2012 – Jun 2012) the prevalence was 11.08 %⁶⁻⁸. Another study done in the neighbouring district of our hospital in 2013 revealed that it was 16.3%¹. In South Central Asia the prevalence of LBW neonates is 27% and as per 2011 NFHS3 (National Family Health Survey -3) statistics and the prevalence in India is 21.5%. Thus we conclude that the socio-economic status and educational qualification of mothers in our area is good and also antenatal care provided at our hospital and identification of high risk pregnancies and their care have been dealt ideally. Mean age is useful indicator for gauging success of family planning programs aiming to reduce maternal mortality, increase contraceptive use – particularly among married and unmarried adolescents and improve health of newborns¹. A study in April 2013 on the socio-demographic profile and antenatal coverage of mothers in a Block PHC in Rural Indore showed that 60% of mothers were less than 20 years of age during first pregnancy⁹. Similarly a study on the effect of maternal age and parity on birth weight among Bengalese of Calcutta showed that mean age at first birth was 21.9 years¹⁰. The census statistics of India in 2014 revealed that the mean age of mothers at first delivery was 19.9. However in the current study we are glad that 50% of mothers were in the age group between 26-30 years of age. The mode of delivery by LSCS (caesarean section) in the current study has been 46%. This is in comparison with study reported in 2013 which is 51.4%¹. The current study also reveals that 58% of the LBW neonates were born at term and out of the total LBW neonates 64% of them had no major neonatal complications. Female infants and firstborn infants have lower birthweights than their counterparts, but are more

likely to survive¹¹. Moreover studies have proposed that gender-specific genes affecting insulin sensitivity are responsible for the gender difference in birth weight and that the genetically more insulin resistant female fetus is less responsive to the trophic effects of insulin and is therefore smaller in size¹². Our current study is in concurrence with the above studies, as we too have observed that 74% of the LBW neonates are female. The maternal risk factors are biologically and socially interrelated; most are, however, modifiable¹³. Our study was also an attempt to compare these factors among low birth weight babies born in our geographical location, and we too have observed some significant comparisons and differences from other studies done as reported above.

CONCLUSION

The current study reveals that the incidence of LBW neonates in our area is comparatively less than in the neighboring districts of our state as well as in comparison to that observed in other parts of India. This coincides with yet another fact that majority of the mothers were in the 26-30 years age group. Majority of the LBW neonates have had no neonatal complications and that the antenatal care has also been good, with majority of the mothers delivering at term and with normal vaginal delivery mode. This could be due to the better socio-economic status and the educational background of mothers. However, a study on the complete socio-demographic profile of mother and family remains plausible.

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CONFLICT OF INTEREST

conflicts of interest declared none.

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