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Original Research Article

A study to evaluate the antenatal profile of mothers and the neonatal outcome in first 72 hours of life in VLBW babies at a tertiary care hospital

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ABSTRACT

Background: Low birth weight (LBW) is well-defined as a birth weight of < 2500 g, as per the WHO. Internationally, it is predictable that 15–20% of all births, or >20 million children yearly, are low birth weight. In developing countries, explanation for an inconsistent encumbrance of LBW; over 95% of the Globally LBW newborns are intuitive in developing countries. Low birth weight is a foremost public health problem in developing countries including India.
Aims & Objectives: To know the antenatal profile of the mother (which includes mother's age, height, weight, body mass index, parity) and the immediate neonatal outcome in VLBW (999-1500 g) babies at a tertiary care hospital. To assess correlation between antenatal care profile of mother and weight of the baby.
Materials and Methods: A Hospital-based descriptive ambispective longitudinal study was conducted among 120 patients at Department of Pediatrics of tertiary care Hospital during February 2021 – August 2021.
Results: Among the study participants, 109(90.8%) were admitted within first day of birth. Only 1.7% cases were admitted after 3 days of birth due to complications. Among the patients, 52% died, while 4% DOR. Out of total, 44% and 16% were Discharged and DAMA, respectively.
Conclusion: Prevention of very low birth weight of a newborn is the best way of promoting better health for babies and it can be achieved by giving adequate care to the females since early childhood and adolescence by promoting better nutrition and health care.

1. Introduction

The birth weight of a newborn is the weight noted after birth for the first time, ideally measured within the first hours after birth as earlier as possible, because than after there is substantial postnatal weight loss has ensued. Low birth weight (LBW) is well-defined as a birth weight of < 2500 g, as per the WHO. Preceding to this, the description of LBW was 2500 g or less. LBW is more classified into very low birth weight (VLBW, <1500 g) and extremely low birth weight (ELBW, <1000 g).[1] LBW is a consequence of preterm birth (PTB, short gestation <37 completed weeks), intrauterine growth restriction (IUGR, also known as fetal growth restriction), or both. Small for gestational age (SGA) refers to babies whose birth weight is less than the 10th percentile for their gestational age.[2]

Internationally, it is predictable that 15–20% of all births, or >20 million children yearly, are low birth weight. In developing countries, explanation for an inconsistent encumbrance of LBW; over 95% of the Globally LBW newborns are intuitive in developing countries. A predictable 6% of infants are born LBW in South East Asia and the Pacific region, while 13% in Sub-Saharan Africa, and up to 28% in South Asia region only.[3]

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Low birth weight is a foremost public health problem in developing countries including India. The epidemiological interpretations represented that infants weighing less than 2500 grams are almost 20 times more expected to die than denser babies, meticulously associated with fetal and neonatal morbidity and mortality. In India, 30-35% of babies of all newborns are low birth weight.[4]

Newborns with low birth weight have a >20 times superior threat of dying than neonates with birth weight of >2500 g because of low immunity and more fragile.[5,6] Furthermore, long-term Consequences of LBW will result into neurologic disability, impaired language development,[7] decreased educational accomplishment, and augmented risk of long-lasting diseases including cardiovascular disease and diabetes as well as other comorbidities & infections.

Birth before 38 weeks of gestational age is the leading cause of death all under-5 child mortality globally.[8] In 2019, total 75% Early neonatal deaths (75%) occur and about 1 million newborns died within the first 24 hours of birth. Preterm birth, childbirth-related complications, infections and birth defects were the reasons of majority of neonatal deaths in year 2019. Malnutrition is the underlying contributing factor, making children even more susceptible to severe infectious diseases.[9] With this background, the present study is conducted to know the prevalence of very low birth weight among newborn babies and to find out the maternal risk factors associated with causes of VLBW babies.

2. Aims & Objectives

To know the antenatal profile of the mother (which includes mother's age, height, weight, body mass index, parity) and the immediate neonatal outcome in VLBW (999-1500 g) babies at a tertiary care hospital. To assess correlation between antenatal care profile of mother and weight of the baby.

3. Materials and Methods

A Hospital-based descriptive ambispective longitudinal study was conducted among 120 patients at Department of Pediatrics of tertiary care Hospital during February 2021 – August 2021. Babies whom birth Weight within the range from 999 g to 1500 g, irrespective of gestational age, place of delivery and ANC history were included. Babies dying in the labour room, during transport to NICU, or while in temporary observation at NICU or stillbirths excluded.

The NICU admission rate was from February to August 2021 as per above, so average admission rate was 120.85. Therefore, total 120 patients were included in the study.

Table 1: Sample size calculation

Month	Total Admission	Mortality rate
February 2021	110	4
March 2021	149	3
April 2021	89	4
May 2021	80	6
June 2021	125	10
July 2021	207	14
August 2021	116	11

The history including the personal details, the mothers' and the babies' details were noted. The data regarding the history, the examination, the diagnosis, the investigations, the treatment were recorded in the Proforma. The maternal demographic profile, weight, height, body built in terms of body mass index, caste, parity and delivery outcome were recorded. The immediate neonatal morbidity and still birth were recorded into the case file.

This study was approved by Institutional Ethical Committee of this institute. Written informed consent was taken prior to the study of each participants.

3.1. Data collection and analysis

Data was collected by case record form and entered into MS excel 2016. Data analysis was done in SPSS Software version 26. Qualitative data were represented as frequency and percentages and analyzed by chi-square test, while Quantitative data were described as a Mean and Standard deviation and analyzed by unpaired t test. P-value less than 0.05 was considered as a statistical significance.

4. Results

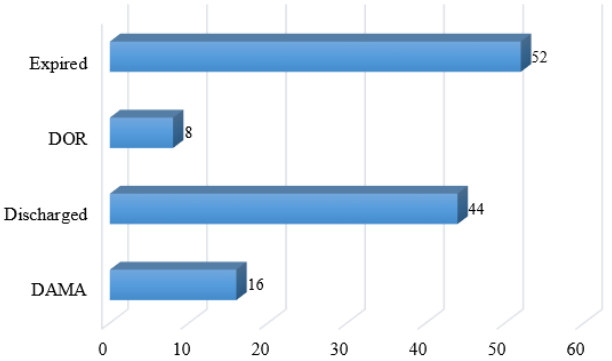

Figure 1: Distribution of outcome among study participants (n=120)

Among the patients, 52% died, while 4% DOR. Out of total, 44% and 16% were Discharged and DAMA, respectively. [Figure 1]

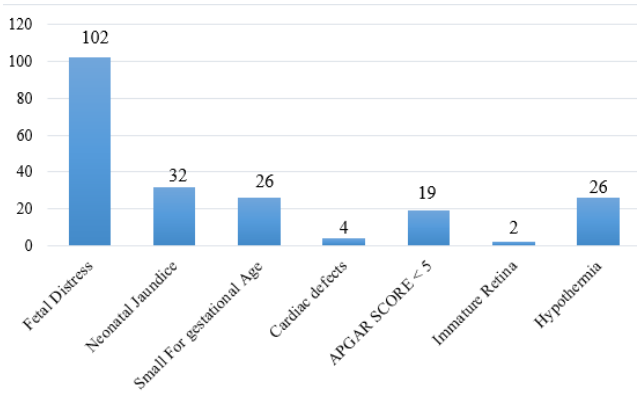

Figure 2: Distribution of diagnosis among study participants (n=120) * Multiple choices allowed

In the study, majority 102 cases had fetal distress, 32 had suffered from Neonatal Jaundice, 26 cases were Samll for Gestational Age and 4 cases of Cardiac defects. Only in 2 Patients immature retina was seen as well as 19 patients had less than 5 APGAR score. Total 26 patients were suffered from Hypothermia. [Figure 2]

Table 2: Distribution of HOL at time of outcome among patients (n=120)

HOL (in hours)	Frequency (%)
< 10	69 (57.5)
11-20	23(19.6)
21-30	18 (15)
31-40	4 (3.3)
>40	6 (5)

Out of total, 69(57.5%) were very well and Outcome within less than 10 hours of treatment. While 5% cases had stay more than 40 hours in ICU due to complications. [Table 2]

Among the study participants, 51 mother's had less than 20 BMI and 69 had more than 20 BMI. There was a significant association found between Mother's BMI and Outcome of babies. Out of total, 67 patients were born by normal vaginal delivery and remaining were born by LSCS mode of delivery. In Normal delivery 23 and in LSCS 29 newborn were died even after provision of treatment. There was a statistically association found between mode of delivery and outcome of VLBW babies. Among the study participants, 22 VLBW babies died of Primipara mothers and 30 deaths of babies occurred in Multipara mother. There was a significant association found between Parity of mother and Outcome of VLBW babies. In the study, total 37 and 15 deaths were occurred in mother's age less than 30 years and more than 30 years, respectively. There was no statistical association found between mother's age and the outcome of VLBW babies. Out of total, total 41, 9 and 2 deaths were occurred in Hindu, Muslim and Christian religion of Mothers, respectively. There was no association found between mother's religion and outcome of babies in this study. [Table 3]

Table 3: Association between various variablesand outcome of patients (n=120)

Variables		Outcome (frequency)		p-value
		Discharged	Death	
Mother's BMI (kg/m^2)	< 20 (n=51)	9	42	0.00001
	> 20 (n=69)	59	10	
Mode of delivery	Normal Vaginal Delivery (n=67)	44	23	0.0252
	LSCS (n=53)	24	29	
Parity	Primipara (n=63)	41	22	0.042
	Multipara (n=57)	27	30	
Mother's Age	< 30 years (n=92)	55	37	0.2118
	> 30 years (n=28)	13	15	
Mother's Religion	Hindu (n=99)	58	41	0.655
	Muslim (n=17)	8	9	
	Christian (n= 4)	2	2	

5. Discussion

VLBW babies are of major cause of public health prolem because of maximum perinatal morbidity and mortality. The reflective scrutiny of maternal antenatal profile in this study represents the various high risk factors responsible for VLBW babies. The mutual factor leading to preterm birth in various literature was Lack of adequate antenatal care.[10–12]

Out of total, 71(59%) were Male and 49 (41%) were females in current study. While in study of Jeganath Sathiya et al,[13] in which 55% were Males and 45% were females, its showed almost similar presentation. In present study total, 44% and 16% were Discharged and DAMA, respectively. Out of total, 69(57.5%) were very well and Outcome within less than 10 hours of treatment. While 5% cases had stay more than 40 hours in ICU due to complications.

In the study, most of participants 83 (72.5%) were stay less than 10 days after birth. Only 1 (0.8%) case had more than 40 days of stay at hospital after birth due to very low birth weight and low immunity leads to secondary infection. The findings of meta-analysis research done by Numerato D et al,[14] in survivors, the longest adjusted mean LoS during the first year of life were observed in Hungary (81.3 days) and Finland (75.2 days). The shortest adjusted

average LoS during the first year among survivors was in the Netherlands (58.1 days) and Scotland (56.8 days). Non-survivors spent more time in hospital in Scotland (26.2 days) and Finland (23.8 days) compared to other countries. The shortest adjusted mean LoS for deceased infants during the first year was observed in the Netherlands (11.5 days), Hungary (13.1 days) and Italy (13.4 days).

In the study, majority 102 cases had fetal distress, 32 had suffered from Neonatal Jaundice, 26 cases were Small for Gestational Age and 4 cases of Cardiac defects. Total 26 patients were suffered from Hypothermia. Out of total, in 53% mother"s had first pregnancy, while 47% mother's had multiparity in the study. Similar findings were found in study of Roy et al.[15] In another study by Kusuda et al,[16] 30.0% of total VLBW infants were because of multiple pregnancy. Other common associations with VLBW births in this study was maternal age less than 20 years. These factors has been seen to be associated with low and very low birth weight deliveries in different other studies.[17,18]

Mean birth weight of VLBW babies in this study was 1.8 + 0.24 kilograms. In other similar studies at Japan, Saudi Arabia and Taiwan, the mean birth weights of VLBW babies were 1.018 kg, 1.133 kg and 1.024 kg respectively.[17–19] The proportion of SGA babies in this study was 21.67 %. Similar to this study, the proportion was 25.8% in a study at Taiwan.[19] The proportions of SGA babies among VLBW infants reported from studies done at Japan (36.0%) and Brazil (39.0%) are higher as compared to that from this study.[20,21]

6. Conclusion

Out of total, 69(57.5%) were very well and Outcome within less than 10 hours of treatment. Only 1 (0.8%) case had more than 40 days of stay at hospital after birth. In the study, majority 102 cases had fetal distress, 32 had suffered from Neonatal Jaundice, 26 cases were small for Gestational Age and 4 cases of Cardiac defects. Only in 2 Patients immature retina was seen as well as 19 patients had less than 5 APGAR score. Total 26 patients were suffered from Hypothermia. There was a statistically association found between mode of delivery, Mother's BMI, Parity of mother and outcome of VLBW babies. Prevention of very low birth weight of a newborn is the best way of promoting better health for babies and it can be achieved by giving adequate care to the females since early childhood and adolescence by promoting better nutrition and health care.

7. Source of Funding

None.

8. Conflict of Interest

None.

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