Introduction

The major concern of every nation is to improve the health status of its populace and the best and the most effective way to achieve it is by focusing on the health issues of women. With an improvement in health services, though there has been significant reduction in infant mortality in India by about 50% during the past century, the reported incidence of low birth weight (LBW) has not changed much. This should follow a life course approach that is starting from the birth of a girl child into her adulthood and beyond. Nations quantify their achievements with the help of indicators such as low birth weight (LBW) which is defined as weight at birth of less than 2500 g (lbs 5.5) regardless of gestational age.

Context: Infant and child survival is recognized as an essential ingredient for the overall health of a society.

Aims: To study the magnitude and epidemiological determinants of LBW.

Settings and Design: Community-based longitudinal study.

Subjects and Methods: A prospective study was conducted for a period of 1 year in Block R.S Pura, Jammu where 364 pregnant women registered at four randomly selected PHCs were followed to assess the magnitude of LBW and to study its association with various determinants.

Statistical Analysis Used: Data was analyzed using MS Excel and Open epi version 3.01.

Results: Severe anemia, heavy physical activity, low socioeconomic status, illiteracy, extreme ages, and short stature of women were found to be significantly associated with a higher incidence of LBW babies.

Conclusion: There is a need to focus on the sensitization of grass-root level health workers as well as pregnant females and their families on the importance of antenatal care, good dietary practices, etc., Thus, strengthening the primary health care system is vital in ensuring optimum health of both mothers and newborns.

Keywords: Anemia, low birth weight, physical activity, prospective study, socioeconomic status
and the growth of the fetus, the data on LBW babies needs to be accurate but it often remains under-reported because of unregistered births and unrecorded birth weights in our country. The prevalence in India is about 18% as reported by NFHS 4.[1]

Most of the times, girls suffer in the area of health and nutrition. In rural areas, the female literacy rate is generally low; girl child is made to marry in adolescence, she starts reproducing when she is physically and mentally unprepared which results in newborns being LBW, deterioration of mother’s health, and the vicious cycle thus continues. Consequently, there is a dire need to ameliorate all factors that will boost the mother’s health status to lessen the incidence of LBW babies.

It has been observed that a strong correlation exists between birth weight and anthropometric measurements of mothers like height, weight, and BMI at the start of pregnancy, and with conditions like hemorrhage, anemia, poor obstetric history, and noncommunicable diseases like diabetes and chronic hypertension. Thus, emphasis should be laid on maternal biosocial factors, which are amenable to improvement to reduce the incidence of LBW babies.

Many studies have been conducted for identification of various factors responsible for LBW but so far, no longitudinal study has been conducted in community settings in our area.

**Aims**

To study the magnitude and epidemiological determinants of LBW.

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**Subjects and Methods**

The present study was carried out for a period of 1 year in Block RS Pura, the field practice area of post graduate department of Community Medicine, Government Medical College (GMC) Jammu. The study participants belonged to four primary health centers (PHC) which were chosen by convenience sampling. The sampling frame and the number of women studied are depicted in Figure 1. The study was initiated after receiving the approval of Institutional Ethic Committee, GMC Jammu. The Block Medical Officer, Medical Officers, and Multipurpose Health Workers in RS Pura Block were sensitized about the purpose of study.

The participants were explained about the study and the women who gave their consent were included. Pregnant women with any chronic medical illness were excluded from the study. A total of 364 pregnant females were included in the study. The women were interviewed in a separate room ensuring their confidentiality. The women were reexamined at an interval of 4 weeks, 3 weeks, and fortnightly in first, second, and third trimester, respectively, at PHCs where they were registered. The women were asked to plan their visit on scheduled time by telephonically reminding them. The study participants, family members, and health workers were asked to inform the investigator at the time of delivery. The investigator reached the home/facility where delivery was conducted and recorded the birth weight of baby within 24 h. In cases where it was not possible, the weight of the baby was recorded within a week. The weight was recorded using calibrated weighing scale (Pan Type). The required information was recorded on a predesigned and pretested Performa with the help of interview. The women were subject to physical measurements by employing standardized methodology and equipment.

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**Figure 1:** Sampling frame
The data so collected was entered into MS Excel and analyzed in excel and web-based software open epi version 3.01. Chi-square test was applied to analyze the associations of LBW with selected epidemiological determinants.

**Results**

Incidence of low birth weight babies was 29.3% in our study [Figure 2]. The mean age (years), weight (kg), and height (cm) of registered pregnant women was 25 ± 3.93, 47.18 ± 7.41, and 146.8 ± 9.99, respectively. Nearly one-fourth of pregnant women were illiterate and an equal percentage belonged to lower socioeconomic strata according to Modified Uday Pareek Scale. Most of the women were engaged in moderate physical activity during pregnancy. 8.2% women had a weight of <40 kg [Table 1].

Of all the variables studied and analyzed to find the association with LBW, low socioeconomic status (SES) (P=0.04), short stature (P=0.01), multiple pregnancy (P=0.01), and anemia (P=0.002) were found to have a statistically significant association with LBW [Table 2].

A higher incidence of LBW babies was observed among moderately and severely anemic women [Figure 3].

**Discussion**

LBW is an important indicator for monitoring progress toward internationally agreed-upon goals and thus is given high priority by national governments and the international community. Impact of various socioeconomic determinants on LBW has been studied extensively. The finding of our study revealed that 29.3% of babies were born with LBW. These findings are in accordance with the studies conducted in different parts of India wherein 27.4% and 28.6% babies were LBW as studied by Kumar et al. and by Sahu et al. Interestingly there is a wide range of variation in the prevalence of LBW from 11%–33%
as reported in other studies and 18% according to NFHS 4.[1,8,9]
There are country wise variations also; from 10.0% in Northern Ethiopia, 10.6% in Pakistan to 21% in Nepal.[10‑12]

There is unequivocal evidence that very young mothers and elderly Primigravida have more chances of delivering LBW babies.[13,14] We also observed a higher incidence of LBW in these two subsets of pregnant women indicating that efforts aimed at delaying first pregnancies and the resultant benefits might have been negated by delayed marriages and first childbirth owing to the adoption of urban lifestyle. In our study, mothers with height less than 145 cm have 82% more chances of delivering LBW babies and similar findings were observed by a study conducted in Ethiopia.[15] Education is known to influence people’s perceptions and dispositions toward health activities and behavior such as maternal feeding practices and utilization of health services. This is more so with respect to maternal education as the incidence of LBW babies has been found to be higher among illiterate mothers and mother belonging to lower SES. Many studies have reported that mothers who are illiterate were at a higher risk of delivering LBW babies[16‑19] Significant association of SES with LBW is hardly surprising as most socioeconomic scales are composite scales with education as one of the important elements.[17,18] This is despite the fact that most women studied by us were from middle class indicating that education has dominant influence on LBW regardless of SES. Therefore, more opportunities for maternal education are likely to yield rich dividends.

Monitoring hemoglobin levels in pregnant women can identify undernourished mothers whose fetus may suffer from ill effects of malnutrition. Emphasis on identification, prevention, and amelioration of anemia has a significant impact on the incidence of LBW.[20‑22] In the present study, the prevalence of anemia among pregnant women was 70.1% which is higher than that reported by NFHS 4 (50%).[1] Various studies have reported anemia prevalence in India ranging from 23.0%–89.0%.[23‑25] Women undertaking heavy physical activity during pregnancy have been reported to have a higher incidence of LBW babies.[26,27] This is hardly surprising as pregnant women often end up consuming lesser proteins and calories during pregnancy thus putting the unborn child at a disadvantage. Coupled with this, large proportions of Indian women are reportedly are of low stature and low weight and it has already been documented by some authors that such women were more prone to have LBW and our findings are in conformity with their observations.[17,28]

Among other risk factors, tobacco chewing and alcohol consumption have been reported to lead to a higher incidence of LBW.[29,30] Smoking causes fetal hypoxia by increasing carboxyhemoglobin levels and attenuates blood oxygen unloading to fetal tissues and reducing maternal blood supply to the placenta. Since only less than 1% women in our study were either smokers or were consuming alcohol, we are limited by our numbers to comment about the relationship.
Conclusion

It is clearly evident that the incidence of LBW and the factors associated with it are widely prevalent across population groups in India. Numbers of strategies put forth by NRHM and Government of India directly or indirectly influence the nutrition of girl right from the conception to old age. We need to identify the bottlenecks and barriers in the implementation of these strategies and ensure that these are addressed at various level of health care.

Finally, it must be kept in mind that the study is not without limitations. The sample size was small for evaluating associations with risk factors. However, the complete follow-up of registered women adds to the strength of the study.

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Conflicts of interest

There are no conflicts of interest.

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