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Assessment of the various study of factors associated with low birth weight in new-borns

Dr. Sushil Kumar Pathak[1], Dr. AK Jaiswal[2*]
[1] Senior Resident, Upgraded Department of Pediatrics, Patna Medical College & Hospital, Patna, Bihar, India
[2] Professor & H.O.D, Upgraded Department of Pediatrics, Patna Medical College & Hospital, Patna, Bihar, India
[*] Corresponding Author: Dr. AK Jaiswal

Abstract
Low birth weight constitutes as sixty to eighty percent of the infant mortality rate in developing countries. Infant mortality due to low birth weight is usually directly causal, stemming from other medical complications. Hence study has been planned to study the factors prevailing in a particular area responsible for low birth weight. With this background in mind the objective of the present study was to identify the maternal risk factors associated with LBW.
The data from the total 60 new born cases enrolled from Upgraded department of Pediatrics, Patna Medical College & Hospital, Patna from Feb 2017 to Dec 2017 in the present study were collected. The 60 cases were divided in the two study groups. The Group A includes the new born having the weight less than 2499gm and Group B includes the new born having the weight of more than 2499 gm.
From the above study it can be concluded that Birth weight is an important factor affecting the neonatal and infant mortality and morbidity. The present study proposes that there are several factors interplaying which lead to LBW babies. Socio-demographic factors (maternal age, educational level and economic status) and antenatal care are more important. Hence precaution should be taken to early recognition of maternal illness and complications that are essential for reducing the LBW in new-borns.

Keywords: low birth weight, risk factors, case control study

Introduction
Low birth weight is a term used to describe babies who are born weighing less than 2,500 grams (5 pounds, 8 ounces). In contrast, the average new born weighs about 8 pounds. Over 8 percent of all new born babies in the United States have low birth weight. The overall rate of these very small babies in the United States is increasing. This is primarily due to the greater numbers of multiple birth babies who are more likely to be born early and weigh less. Over half of multiple birth babies have low birth weight compared with only about 6 percent of single birth babies. Babies with low birth weight look much smaller than other babies of normal birth weight. A low birth weight baby's head may appear to be bigger than the rest of the body, and he or she often looks thin with little body fat.
The primary cause of low birth weight is premature birth (being born before 37 weeks gestation). Being born early means a baby has less time in the mother's uterus to grow and gain weight. Much of a baby's weight is gained during the latter part of pregnancy. Another cause of low birth weight is intrauterine growth restriction (IUGR). This occurs when a baby does not grow well during pregnancy because of problems with the placenta, the mother's health, or the baby's condition. A baby can have IUGR and be born at full term (37 to 41 weeks). Babies with IUGR born at term may be physically mature but may be weak. Premature babies that have IUGR are both very small and physically immature.
During pregnancy, a baby's birth weight can be estimated in different ways. The height of the fundus (the top of a mother's uterus) can be measured from the pubic bone. This measurement in centimeters usually corresponds with the number of weeks of pregnancy after the 20th week. If the measurement is low for the number of weeks, the baby may be smaller than expected. Ultrasound (a test using sound waves to create a picture of internal structures) is a more accurate method of estimating fetal size. Measurements can be taken of the fetus' head, abdomen, and femur and compared with a growth chart to estimate fetal weight.
Babies are weighed within the first few hours after birth. The weight is compared with the baby's gestational age and recorded in the medical record. A birth weight less than 2,500 grams (5 pounds, 8 ounces) is diagnosed as low birth weight. Babies weighing less than 1,500 grams (3 pounds, 5 ounces) at birth are considered very low birth weight [1].
Low birth weight (LBW), pre-term birth and pre-eclampsia have been associated with maternal periodontitis exposure. But the strength of the observed associations is inconsistent and vary according to the population studied, the means of periodontal assessment and the periodontal disease classification employed. However the best is that the risk of low birth weight can be reduced with very simple therapy. Treatment of periodontal disease during gestation period is safe and reduction in inflammatory burden reduces the risk of preterm birth as well as low birth weight [2].
Because of the tremendous advances in care of sick and premature babies, more and more babies are surviving despite being born early and being born very small. However, prevention of preterm births is one of the best ways to prevent babies born with low birth weight.
Prenatal care is a key factor in preventing preterm births and low birth weight babies. At prenatal visits, the health of both mother and fetus can be checked. Because maternal nutrition and weight gain are linked with fetal weight gain and birth weight, eating a healthy diet and gaining the proper amount of weight in pregnancy are essential. Mothers should also avoid alcohol, cigarettes, and illicit drugs, which can

contribute to poor fetal growth, among other complications.
LBW is closely associated with fetal and perinatal mortality and Morbidity, inhibited growth and cognitive development, and chronic diseases later in life. At the population level, the proportion of babies with a LBW is an indicator of a multifaceted public-health problem that includes long-term maternal malnutrition, ill health, hard work and poor health care in pregnancy. On an individual basis, LBW is an important predictor of new born health and survival and is associated with higher risk of infant and childhood mortality [3].
Low birth weight constitutes as sixty to eighty percent of the infant mortality rate in developing countries. Infant mortality due to low birth weight is usually directly causal, stemming from other medical complications such as preterm birth, poor maternal nutritional status, lack of prenatal care, maternal sickness during pregnancy, and an unhygienic home environment. According to an analysis by University of Oregon, reduced brain volume in children is also tied to low birth-weight [4].
Hence study has been planned to study the factors prevailing in a particular area responsible for low birth weight. With this background in mind the objective of the present study was to identify the maternal risk factors associated with LBW.

Methodology

The data from the total 60 new born cases enrolled Upgraded department of Pediatrics, Patna Medical College & Hospital, Patna, Feb 2017 Dec 2017 in the present study were collected. The 60 cases were divided in the two study groups. The Group A includes the new born having the weight less than 2499gm and Group B includes the new born having the weight of more than 2499 gm.
All the cases were informed consents of their parents. The approval of the institutional ethical committee was taken prior to conduct of the study. The standardised questionnaire was prepared and after the informed consent the data was gathered.
Information related to mother such as age, height, weight, socio-economic status (SES), parity, gestational age, diseases during pregnancy and information related to baby such as birth weight and sex were extracted from the records.
The following was the inclusion and exclusion criteria for the present study.

Inclusion criteria

- The Group A includes the new born having the weight less than 2499gm and
- Group B includes the new born having the weight of more than 2499gm.

Exclusion criteria

- Deliveries with in complete records were excluded from study.
- Those parents who were not giving consent.

Results and Discussion

The data from the total 60 new born cases enrolled in the present study were collected. The 60 cases were divided in the two study groups. The Group A includes the new born having the weight less than 2499gm and Group B includes the new born having the weight of more than 2499 gm.

Table 1: Demographic Data of mothers

Variable	Group A	Group B
No. of Cases	**30**	**30**
Birth Weight	less than 2499 gm	more than 2499 gm
Age years	21-26	22-28
Height cm	151. ±5.6	153.8 ± 4.9
Pre pregnancy weight kg	43-54	46-56
Mean Weight gain in pregnancy kg	2.5-4.9	3.2-5.5

Table 2: Different Factors in study group

Variable		Group A	Group B
Total No. of Cases		**30**	**30**
		Observed Cases	
Age of mother (years)		21-26	22-28
Socio-economic status	Lower class	21	19
	Middle class	9	11
Maternal education	Illiterate	10	8
	primary	20	22
Pre pregnancy weight < 45 kg		23	6
Spacing < 2years		16	20
Primigravida		15	18
Bad obstetrics history		16	10
Maternal Infections		3	2
History of infertility		2	3
Tobacco consumption		4	2
Heavy physical activity		14	16
Pregnancy Induced Hypertension		7	6
Anaemia		11	14
Caesarean section delivery		15	13

According to UNICEF estimate, every third new born (30%) in India is LBW [5]. The National Family Health Survey (NFHS)-3 reported that 21.5% of all children had LBW. The proportion of low birth weight babies in a Kerala based study was found to be 18% [6].
There are number of studies around the world done on this subject by using different methodologies. Either they Risk Factors Associated with Low Birth Weight evaluate the effects of the factors in isolation through cross tabulations or, utilizing statistical techniques to see the individual factors in presence of others. The latter is more likely to give a better indication of the contribution to low birth weight of each of the various risk factors. Both ways were followed in this study. Some of the information of this study was collected from the mother by interviewing her and some by reviewing the records.
Krammer [7], Hirve and Ganatra [8] Deshmukh *et al.* [9] also found significant association between socioeconomic status and birth weight of baby. The percentage of illiterate and primary education was more in cases (35.5%) as compared to control group (24.5%). Hirve and Ganatra [8] found that the adjusted odds ratio for delivering LBW decreases significantly within creasing education status of the mother. In rural area women from lower socioeconomic status often continue strenuous physical work through pregnancy. In our study, maternal age had no significant association with LBW. Our findings on maternal age as a risk factor is consistent with studies conducted by Mavalankar *et al.* [10] in India and Fikree *et al.* [11] in Pakistan. Anand and Garg [12] also found no significant relationship between maternal age and LBW. Proportion of primigravida was high among cases as

compared to control but the difference was not statistically significant. In contrast, previous studies have revealed that primiparity is significantly associated with LBW [9, 13]. This study has shown that low birth weight was significantly associated with in a adequate antenatal care, pre-delivery weight ≤45 kg, height ≤145 cm, bad obstetrics history, tobacco consumption, PIH and anemia. These findings are consistent with Kramer's meta-analysis. In a hospital-based study in Calcutta Pahari *et al*. [14] Reported abortion as one of the main-causes of a dverse pregnancy outcomes in addition to anaemia and hypertensive disorder. Anemia was one of the common problems in the present study from rural area. Almost 42.5% of mothers who delivered LBW babies were anaemic. Deshmukh *et al*. [9] also found that anaemia was significantly associated with LBW. Similarly, Mavlankar *et al*. [10] observed that pre pregnancy maternal weight, and anaemia was important determinant of low birth weight. Deswal *et al*. [15] also reported that low maternal weight, under nutrition, lack of antenatal care, short inter-pregnancy interval, toxemia of pregnancy were independent factors increasing the risk of low birth weight significantly.

Conclusion

From the above study it can be concluded that Birth weight is an important factor affecting the neonatal and infant mortality and morbidity. The present study proposes that there are several factors interplaying which lead to LBW babies. Socio-demographic factors (maternal age, educational level and economic status) and antenatal care are more important. Hence precaution should be taken to early recognition of maternal illness and complications that are essential for reducing the LBW in newborns.

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