



## Original Article

# Maternal Risk Factors Influencing Birth Weight of New Borns: A Primary Health Care Center Based Study

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## Abstract

*The present study was carried out to identify the maternal factors which determine the birth weight, as birth weight is an indicator of chances of survival. Materials and methods: The study was conducted in pregnant women and their newborns (n =100) parameters selected for study were maternal age, maternal weight at first visit to the primary health center and at term, maternal height, hemoglobin percentage, initial birth weight the newborn. Results and discussion: maternal factors included in the study were found to be risk factors for the low birth weight of newborn. Conclusion: From the study we found that the major risk factor for low birth weight was lack of knowledge in the mothers regarding prevention of. Hence there is a need to assess the knowledge of rural pregnant women and conduct a structured teaching program on prevention of low birth weight.*

**Key words:** *Pregnancy, Maternal factors, Low birth weight, Rural population.*

## Introduction

The present study was carried out to assess the magnitude and a factor contributing of LBW. Infant birth weight is a primary determinant of infant mortality risk. Psycho physiological stress is likely to accelerate the release of corticotrophin-releasing hormone, which initiates a cascade of events leading to preterm delivery. <sup>1</sup>Birth weight is an important determinant of its future development. Low birth weight (LBW) is defined by WHO as weight less than 2500 grams at birth regardless of gestational age. LBW puts a

newborn at increased risk of death and illness and limits their growth potential in the adulthood. LBW contributes to 40–60% of newborn mortality. LBW can be caused by preterm birth or by intrauterine growth restriction<sup>2</sup>. Anemia increases the morbidity risk greater risk of perinatal mortality and morbidity Estimates from the World Health Organization report 56% on average of pregnant women in developing countries<sup>3,4</sup> Infants weighing lesser than 2500 g are approximately 20 times more likely to die than normal babies. Mothers should have preventive

and promotion services to avoid low birth weight. In view of its magnitude of LBW and the associated factors appropriate strategies can be designed to tackle the problem. According to UNICEF estimate, almost every third newborn (30%) in India is LBW. India, the second most populous country of the world.<sup>5,6</sup>

The principal factors were maternal age, weight, height, education, parity, antenatal care, and handicapping conditions during childhood where women with short and underweight deliver low birth weight (LBW) babies<sup>7</sup>. Low birth weight (i.e. birth weight <2500 g) is significantly related to neonatal survival and postnatal morbidity. Neurological disability, chronic diseases, inhibited growth are more common in low birth weight infants resulting in more frequent hospitalization and outpatient visits<sup>8</sup>. Young maternal age at childbearing ( $\leq 19$  years) is associated with an increased risk of preterm birth and intrauterine growth restriction, infant mortality, and chromosomal abnormalities. Advanced maternal age ( $\geq 35$  years) is associated with increased stillbirths, preterm births, intrauterine growth restriction<sup>9</sup>. Keeping all these in view, an attempt has been made to carry out a study on LBW babies.

### Materials and Methods

The area of study was specifically chosen adjacent to the Primary Health Center, Mutluru, Guntur District where effective, controlled, and free services could be provided to the beneficiaries. The area is served by an auxiliary nurse midwife (ANM) and Anganwadi worker (AWW). Nutritional status of mothers has been demonstrated to be an important determinant of birth weight by Kramer and Mavalankar. Ethical committee clearance was obtained from the institutional ethical clearance committee. Prior to the study, consent was taken from subjects of both control and case group and each subject was informed in detail of the objectives and aim of the research protocol and the method to be used.

Inclusion criteria for the study population were pregnant women who have agreed to follow the intervention protocol of our study. Height and weight were recorded using standard equipment. Weight of the mother at the start of 1st trimester was taken as the initial weight and thereafter, every month weight gain was observed. Hemoglobin level 11 g% was taken as the cut-off point for anemia as per WHO criteria. The nursing staff of the labor room was specially trained to record birth weight of the newborns using the digital weighing scale. Variables for the study were maternal factors (maternal height and weight, age of mother, hemoglobin % level). Hemoglobin estimation measured using Symx Kx 21 fully automated hematology analyzer. The first weight of the new born was obtained after birth. The weight was measured within the first hour of life before significant postnatal loss of weight has occurred. Heavy objects like metal forceps, for occluding umbilical cord were omitted. Weight scales were checked at intervals for accuracy. The neonates were weighed naked within 24 hours after birth in a spring-dial baby weighing machine with sensitivity of 20 gms and graded up to 4 1/2 kgs in 20 gram units.

### Statistical Methods

Data were reported as mean and standard deviation (mean $\pm$ SD), mean were compared between two groups by unpaired 't' test. A 'p' value of less than 0.05 was considered statistically significant. Descriptive statistical analysis was carried out in the present study. Result on continuous measurements were presented on (Mean $\pm$  SD). Student 't' test was used to find the significance of study parameters between two groups.

**Results****Table**

Parameters	Mean $\pm$ SD	Birth weight (in grams) Mean $\pm$ SD	't' value	'p' value
Age (in years)	16.882 $\pm$ 36	1964 $\pm$ 444.36	30.98	0.0001
Weight before pregnancy (in Kilograms)	39.48 $\pm$ 2.38	1964 $\pm$ 444.36	30.62	0.0001
Weight at term (in Kilograms)	47.28 $\pm$ 2.29	1964 $\pm$ 444.36	30.50	0.0001
Height (in cm)	150.38 $\pm$ 4.21	1964 $\pm$ 444.36	28.85	0.0001
Hemoglobin (in gm %)	8.16 $\pm$ 1.18	1964 $\pm$ 444.36	31.12	0.0001

The present study has been carried out on fifty pregnant women and new born fifty each. As shown in the table, on analyzing the data of maternal parameters the found average age was 16.88  $\pm$  2.36, the average weight before pregnancy was found to be 39.48  $\pm$  2.38, the average weight at term was found to be 47.28  $\pm$  2.29, the average height was found to be 150.38  $\pm$  4.21 and average hemoglobin was found to be 8.16  $\pm$  1.18 and the average birth weight was found to be 1964  $\pm$  444.36. In the study we found that there was a decrease in the birth weight of the new born with parameters of mothers who were less for the normal at term which were statistically significant.

**Discussion**

In the present study, the data we have presented here document how maternal factors influence low birth weight. Our findings confirm that there is a decrease in low birth weight, which were influenced by maternal age, height, weight and hemoglobin percentage. In the present study the prevalence of low birth weight was examined. The results found were statistically significant. The findings of our study coincide with findings of P.S.Thomre<sup>10</sup>, Ashok K.Deorari<sup>11</sup> et al. Among individuals born preterm, the risk for higher levels of autism-spectrum traits, particularly those related to skills and preferences in social interaction, may persist into young adulthood<sup>12</sup>. LBW in later age had more visual and hearing impairments, lower intelligence test scores. Less

than 60% of those survived their first year of life had lower attention scores, language skills, scholastic competence<sup>13</sup>. Advances in perinatal care have improved the rates of survival to discharge for extremely low birth weight and extremely low gestational age infants<sup>14</sup>. Public health strategies to reduce the currently high prevalence of low birth weight, preterm delivery, and infant mortality should include counseling that strongly encourages intervals of nine months or more between pregnancies<sup>15</sup>.

**Conclusion**

History of younger age, height, weight at pregnancy, mother's lower hemoglobin level and lack of nutritious diet consumption and hard physical work during pregnancy were the major determinants of low birth weight. Public health programs should focus on raising awareness on avoiding early marriage and pregnancy of females. Moreover, it should provide emphasis on adequate rest and nutrition during pregnancy in order to maintain adequate weight at term. Provision of a more intensive ante natal care to mothers can be another important strategy to prevent low birth weight babies. The role of family members is important especially in fulfilling the nutritional and health care needs of the pregnant mothers. Further research endeavors that the focus on the maternal risk factor will be beneficial by expanding our knowledge base concerning low birth weight.

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