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LOW BIRTH WEIGHT BABIES - INCIDENCE AND FACTORS INVOLVED

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INTRODUCTION

Health is to be "a state ofcomplete physical, mental and social well being and not merely the absence ofdiseases or infinnity". This is the main objective of health services including maternal and child health of our nation. Birth weight is a good reflector of the status of maternal health. It is also true that birth weight is the single most important factor that affects neonatal mortality and morbidity, infant and childhood morbidity. Low birth weight i.e. weight below 2500 gms may indicate that the baby did not remain in the uterus long enough or it did not develop well enough. Neonates with weight less than 10th percentile or more than 2 SD below the mean for the gestation age are classified as small for gestational age. This group of neonates with poor intra uterine growth remains the cause of concern in developing countries including India. The incidence of low birth weight (LBW) in India varies between 25-3a% and of which 60-65% are because of intra uterine growth retardation (lUGR).

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Birth weight or size at birth is an important indicator of the child's vulnerability to the risk of childhood illnesses and to predict the child's future health, development, and the chances of survival.

Evidence from developing countries over time also demonstrates that the incidence of IUGR decreases as a country becomes more developed. Some ofthe adverse factors responsible are maternal malnutrition, anemia, inadequate prenatal care,

drug abuse, birth order, maternal medical problem, e.g., pregnancy induced hypertension, diabetes mellitus, cardiac diseases and chronic infections.

The present study was undertaken to know the incidence of low birth babies in a mixed population having a varied socio-economic background and to study the associated maternal risk factors like social, obstetric and anthropometric factors in low birth weight babies.

Low birth weight (LBW) is an important determinant of childhood morbidity and mortality.Child's birth weight is a significant factor which determines vulnerability for risk of childhood illnesses and childhood survival. Consequently, children who are born with weight less than 2.5 kg are vulnerable for dying during their early childhood. Moreover, research highlight strong associations between LBW and increased risk of infections, malnutrition, poor academic performance and problems related to mental, behavior and learning difficulties during childhood.

Consequences of LBW trek into adulthood and can cause range of chronic diseases, e.g., ischemic heart disease, stroke, hypertension, diabetes, metabolic syndrome, malignancies, dementia, and osteoarthritis.

Low-income countries account for majority share of LBW. Half of the children with a LBW were born in South Asia and among these countries India and Bangladesh has the highest prevalence of LBW (30%). Consequently, strategies to reduce prevalence of LBW is important in order to achieve the forth Millennium Development Goals (MDG 4)-reduce child mortality.

Contributing factors for LBW are multifaceted and include factors such as maternal age, poor maternal nutritional status, and non-pregnant weight, gestational age, intervals between pregnancies, parity, educational status, violence during pregnancy, lack of antenatal care (ANC) and very low socio-economic status.

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In India, low body mass index (BMI), short stature, anemia and/or other micronutrient deficiencies are known to increase the risk of giving birth to a baby with LBW. For example, low BMI is a reliable indicator for protein-energy malnutrition, which affects fetal growth during pregnancy.

The nutritional status of a pregnant woman can be affected by many factors including low socio-economic status, higher parity and short inter-pregnancy interval.Women with low socio-economic status are more likely to have inadequate food intake, unhygienic housing and lack of sanitation, reduced ability to seek medical care and purchase medicine/supplements, which then affects the birth weight of their infants.

The incidences of placenta previa and malpresentation increases with high parity and these complications may predispose a women to give birth to an infant with LBW. An association between short (<18 months) and long (>59 months) inter-pregnancy intervals and LBW was highlighted in literatures.

Maternal nutrient stores may deplete as a result of short inter-pregnancy intervals thus may reduce the birth weight of an infant.

There is a strong association between lack of ANC and adverse pregnancy outcomes. Antenatal Clinics are an essential element of the health services provided during pregnancy. These clinics provide services such as screening, prevention, and treatment of pregnancy-related complications. The World Health Organization (WHO) recommends at least four standard quality antenatal care visits comprising interventions such as tetanus toxoid vaccination, screening and treatment for infections, and identification of warning signs during pregnancy.

Evidence highlighting determinants of LBW are discussed above, but most studies were conducted in specific settings, e.g., rural or hospital-based studies. Study populations were relatively small and/or major determinants of LBW across a country may not have taken into account in some of these studies. Therefore, current study aims to address these methodological issues by including a large population across India and inclusion of multifaceted risk factors known to influence LBW. Accordingly, this study aims to investigate the association between maternal socio-economic status, nutritional status, and use of ANC and risk of LBW in India.

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Findings may benefit to highlight key modifiable risk factors and implement multifaceted health promotion interventions to reduce to prevalence of LBW.

Aim:

This study aims to identify the factors affecting and incidence of LBW in India.

Socio-Demographic, Anthropometric and Nutritional Variables

A set of theoretically relevant and well established risk factors for LBW was adapted for the Study. Major factors such as socio-demographic, anthropometric, nutritional status, and health service received during pregnancy (discussed below) were included in the study.

Birth weight

Birth weights were asking mothers to recall their child's birth weight. Birth weights were recorded for 34% of the infants (n = 20,946) with complete gestational age (>37 weeks). In India, over 50% of deliveries occur at home and often newborns are not weighed at birth.

According to the WHO's classification of LBW, birth weight <2500.0 g was classified as LBW. The data was coded using this criterion into “LBW” and “normal weight” categories.

Socio-economic status and caste/tribe

Household socio-economic status was measured using a validated assessment of household assets. Every household was assigned a standardized score for each asset depending on whether or not the household owned that asset. Sum of the scores of all assets in a household was used to generate the household's wealth index score which were categorized into five socio-economic quintiles and given a rank from one (poorest) to five (richest) used in data, as discussed elsewhere. They were further categorized as poor, middle class, and better off in the present study. The caste woman was classified as “scheduled caste”, “scheduled tribe”, “other backward class”, and “none (general caste)”. This classification of caste focuses more on the socially disadvantaged castes, and all privileged caste groups are coded in the “general caste” group.

Antenatal care (ANC) visits

WHO recommends minimum of four antenatal visits for a woman with normal pregnancy. Therefore, women were categorized into to two groups, “<4 visits” and “≥4 visits”

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Anthropometric, nutritional and other variables

The height and weight of women were measured using a solar-powered electronic (SECA) scale with a digital screen. These SECA scales were designed and manufactured under the guidance of the United Nations Children's Fund (UNICEF). A cutoff point of 145 centimeters (cm) was used to define short stature as per Body mass index was calculated using the standard formula-Weight (kg)/Height^2 (m^2)The cut-off point of BMI <18.5 was set as underweight as per WHO.

The data performed blood tests to obtain hemoglobin levels of the women survey participants. Then the hemoglobin levels of these women were adjusted for altitude, smoking, and pregnancy by categorized into severe, moderate, mild and not anemic groups. For the purpose of this study, these categories were recoded into “moderate to severe”, “mild” and “not anemic”. BMI, stature and level of anemia were used as proxy to measure maternal nutritional status.

Age of mother was coded into “<20 years”, “20-35 years”, and “>35 years” based on findings from previous studies. For example, women aged <20 yearsand women delaying their first pregnancy beyond 35 yearswere at increased risk for giving birth to babies with LBW.

Maternal education was measured in years of schooling and categorized into “no education”, “primary education” (1-5 years), “secondary education”, (6-12 years), and “higher education” (more than 12 years). Parity was categorized into “first birth” (nulliparous), “parity 2-4” (multiparous) and “parity ≥5” (grand-and great grand multiparous). An association between short (<18 months) and long (>59 months) inter-pregnancy intervals and LBW was highlighted in many studies.Therefore, inter-pregnancy intervals were coded into “<18 months”, “18-59 months” and “>59 months”. Place of residence was grouped into “urban” and “rural”.

CONCEPTUALIZATION OF THE PROBLEM

Low-birth-weight is a national concern and also has importance in population policies. Therefore, it is also essential to know the percentage of lowbirth-weight babies among who were weighed at the time of birth or within two days of the birth. But the RCH survey, 1998–99, many of women could not remember the birth-weight of their babies among who were weighed within two days of the birth. This is a major drawback to carryout further analysis, whereas, the number of weighed babies itself is not large. The factors that affect birth-weight may be biological or socio-economic-demographic and also related to the health services. The biological factors are

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mainly two major causes, duration of gestation and intrauterine growth rate. Mainly mother's health condition, history of previous low birth delivery, illness, complication in pregnancy, and past adverse pregnancy outcome may cause low-birth-weight. Even outdoor air pollution results in delivery of low-birth-weight babies. Maternal nutritional status is a prime factor of the new born baby's weight. Nutritional level of mother is also influenced by several socio-economic and demographic factors. Joshi et al., (2005) estimated in Swaroop Rani Nehru Hospital in Allahabad during 2001–2002, that 34.4 percentnewborn were low-birth-weight babies. Maternal education, occupational status, and per capita income of the family per month were significantly correlated with birth-weight but not the sex and the religion of the baby. Young mothers, women with low antenatal care, and also with more children, are at relatively higher risk of having low-birthweight babies (Aras et al., 1989; Yasmin et al., 2001). Mothers in deprived socio-economic conditions frequently have low-birth-weight babies. In such conditions, the infant's low-birth-weight stems primarily from mother's poor nutrition and health over a long period, including during pregnancy, and the high prevalence of specific infections, or from pregnancy complications, underpinned by poverty. Physically demanding work during pregnancy also causes to poor foetal growth (UNICEF, 2004). Some other studies have simply highlighted the association between social factors and low-birth-weight and suggested that poverty could affect maternal health status at the time of conception through lower physiologic reserves or that unhealthy women are more likely to be concentrated in the lower social classes in the society (Antonovosky and Bernstein, 1977; Lieberman, 1995)

CONCLUSION

Maternal socio-economic status,nutritional status and antenatal care are received were identified inthis study as important determinants of LBW in India. These key mediating factors that need to be considered to improve birth weight of infants and targeted public health interventions are needed to improve these factors.

The occurrence of low-birth-weight babies (among those weighed) is also high in northern and central States in India even when controlled for other socio-economic and demographic factors. Mother's education has played an important role and higher educational attainment of mother reduces the incidence of low-birth-weight babies. Living conditions also matter; naturally incidence of low birth falls as the level of living rises. Further analysis shows that babies from

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socially disadvantaged sections such as the scheduled castes and tribes are more likely to have low-birth-weight than others. Note that this is the case even after effects of other factors, including mother's education and standard of living, are controlled. Given that the scheduled castes and tribes are also more likely to be poor and less educated than others, the disadvantage is compounded. The public health programmes in India do seek to provide care to the newborn and also to work towards equity in such care so that the deprived sections are also assured of at least the minimum required care. Yet, the issue of low-birth-weight, so well recognized by the public health community, does not receive a prominent mention in the programme literature. Besides, as the evidence shows, the programme has not been successful even at the basic step of identifying low-birth-weight babies.

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