A Study of Factors Affecting Low Birth Weight in a Tertiary Care Centre

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Abstract:

Background: The World Health Organization defines "the term Low birth weight as birth weight less than 2500 grams irrespective of the duration of the gestational period." Low-birth-weight (LBW) is "universal accepted indicator of health status. It is a subject of national concern and a focus of health policy. LBW has been shown to be associated with a higher risk of childhood mortality and morbidity.

Methods: Total of 300 LBW babies (cases) and 600 NBW babies (controls) among all deliveries within the study duration of Two years. The sample size for the present study was 900, considering 1:2 ratio of cases: controls. Data collected were entered using Epidata 3.1 and coding was done.

Conclusion: To conclude, present study showed higher rate of low birth weight foundamong mothers who were illiterates, and who had no primary and secondary education.

Keywords: Low birth weight, Maternal factors, Mortality.

Introduction

The World Health Organization has defined the term "Low birth weight" as birthweight less than 2500 grams irrespective of the duration of the gestational period. [1] Globally, more than 20 million infants are born with low birth weight. [2] The prevalence of LBW infants in India is about 28%, as compared to 4% inindustrially developed countries. [3] According to epidemiological observational studies infants weighing lesser than 2500g are approximately 20 times more likely to die than heavier babies and are closely associated with the foetal and neonatal mortality and morbidity. [4] Low birth weight leads to impaired growth of the newborn with its attendant risks of a higher mortality rate, increased morbidity, impaired mental development, and a higherrisk of chronic adult disease. [5] Weight at birth is directly influenced by general health status of the mother. Early induction of labour or caesarean section birth, infections, other chronic conditions, multiple pregnancies, pregnancy induced hypertension contribute to low birth weight outcome. Fetal and neonatal mortality Poor development with respect to cognition and higher chronic disease risk in late period of life are the major consequences of low birth weight in India. The most important measure of low birth weight estimates or predicts the mortality and morbidity which directly or indirectly reflects the nutritional rate or status and growth rates. [6] According to World health organization about 25 million low birth weight babies are born each year, nearly 95% of them in developing countries [2]. South East Asia has the highest prevalence of low birth weight babies. "The global reduction in mortality of children aged <5 years between 1990 and 2015 was 53% against the aim of a two-thirds reduction by Millennium Development Goals. For under five mortality estimation reports "an almost constant annual rate of reduction in south-east Asia during this period. [7] Nevertheless, low birth weight is a global concern, as some high-income countries are also faced with high rates for their contexts The low birth weight prevalence is about 28%, as compared to 4% in industrially developed countries. [3] The proportional contribution of infant deaths to overall child mortality has increased over the years and has reached 73%, so it is important to target this period of life. The goal was "to reduce the infant mortality rate (IMR) from 72/1000 live births in 1998 to 57/1000 live births in 2006 according to the Sample Registration System (SRS) of India reported a decline in, which further declined to 39/1000 live births in 2014. Moreover, in rural India where the majority of births take place, the IMR is significantly higher than in urban areas. In the developing countries Infant mortality rate is very high compared to developed countries. Of the various

causes of Infant mortality, either in developing or developed countries, birth weight is one of the important factors for the survival, normal growth and development of a child. The low birth weight is considered as sensitive index of nation's health and development. [8] Low birth weight leads to impaired growth of the newborn with its attendant risks ofa higher mortality rate, increased morbidity, impaired mental development, and a higher risk of chronic adult disease. [5] Weight at birth is directly influenced by generalhealth status of the mother. This study estimates the proportion of babies with low birth weight and to identify the maternal risk factors associated with these low birth weight deliveries. [9]

Objectives

To study factors affecting Low Birth Weight in a tertiary care centre

Material and Methods

The present study was a hospital based case-control study, The study was done, Study duration of Two years. department of Community medicine at Darbhanga Medical college and Hospital Laheriasarai, Darbhanga, Bihar. ascertain the feasibility of the study as well as to ensure that the questionnaire collects sufficient data so as to meet the study objectives. The sequential order of few questions in the questionnaire was modified for better collection of data. Thus the data collecting tools were standardized and validated during the pilot study so as to ensure better data collection. Study subjects included mothers delivering Low Birth Weight (LBW) babies at term and mothers delivering Normal Birth Weight (NBW) babies at tem in the study setting. As per the data collected from the hospital records, the average number of low birth deliveries occurred during the past 2 years (who satisfy the present study criteria) accounted to 320. Total of 300 LBW babies (cases) and 600 NBW babies, For selection of the controls maternal age and parity were matched. When two or more suitable matched controls were available for a case, two controls were selected randomly. Low birth weight continues to be a significant public health problem globally and is associated with a range of both short- and long term consequences.

Inclusion Criteria: All pregnant women who have delivered term singleton low birth weight baby were considered for study, irrespective of mode of delivery. Those mother willing to participate and gave consent for the study.

Exclusion Criteria: Preterm deliveries, Pregnant women delivering still born babies, multiple babies, Pregnant women delivering babies with birth defects, Pregnant women suffering from chronic illness and any illness during pregnancy and at the time of delivery.

Results

Distribution of study subjects according to age group

Age group	Cases (N=300) No. (%)	Controls (N=600) No. (%)	Total (N=900) No. (%)
<19	37 (12.3)	25 (4.2)	62 (6.9)
19-24	148 (49.3)	300 (50.0)	448 (49.8)
25-29	86 (28.7)	197 (32.8)	283 (31.4)
30-35	24 (8.0)	75 (12.5)	99 (11.0)
>35	5 (1.7)	3 (0.5)	8 (0.9)
Total	300 (100)	600 (100)	900 (100)

the distribution of study participants according to different age groups. The total number of study subjects were 900 among them 600 were controls of normal birth weight and 300 were cases of low birth weight. Majority of the study population 448 (49.8%) belong to age group of 19-24 years followed by 25-29 year age group. In present study population >35 age group was the least about 8 (0.9%) of total study subjects. Among cases majority 148 (49.3%) and among controls 300 (50.0%) belonged to belonged to age group of 19-24 years. Distribution of study subjects according to religion

Religion	Cases (N=300) No. (%)	Controls (N=600) No. (%)	Total (N=900) No. (%)
Hindu	278 (92.7)	514 (85.7)	792 (88.0)
Muslim	8 (2.7)	23 (3.8)	31 (3.4)
Others	14 (4.7)	63 (10.5)	77 (8.6)
Total	300 (100)	600 (100)	900 (100)

the distribution of study participants according to religion. Majority among the cases and controls belonged to hindu religion. About 278 (92.7%)of cases and 514 (85.7%) controls were hindu by religion. Subjects belonging to muslim religion were 8 (2.7%) and 23 (3.8%) of cases and controls

respectively. Other religion category included christian, jain which contributed to 14 (4.7%) and 63 (10.5%) of cases and controls respectively. Out of the total 900 study participants majority of the subjects were graduates 237 (26.3%) were graduates followed by high school 215 (23.9%) educated upto highschool, 187(20.8%) postgraduates, 166 (18.4%) primary/secondary postgraduates and 95(10.6%) illiterates respectively. [10] Among the cases of low birth weight, mothers who had high school education and graduation were almost equal in number i.e 77 (25.7%) and 75 (25.0%) respectively. In the control group majority about 160 (26.7 %)were graduates and only about 51 (8.5%) were illiterate. distribution of cases and controls according to maternal occupation. Majority of the mothers in the study subjects were housewife by occupation 275 (30.6%). [11,12] A substantial number of study subjects i.e 252 (28.0%) and 246 (27.3%) were engaged in coolie and agricultural work respectively. About 93 (10.3%) were professional belonged to particular field of profession with a bachelor degree. Only 34 (3.8 %) were engaged in other service work. low birth weight and normal birth weight infants in relation to maternal characteristics. Majority of mothers i.e cases and controls were in 19-29 years age group. Out of the 900 study subjects about 280 (31.11%) were first time conceiving mothers. About 130 (39.0 %) of cases and 284 (47.3 %) of controls had height < 145cms. Around 14 (4.6 %) of cases and 63 (10.6 %) of controls had severe anaemia. Out of the 900 cases and controls >60 kgs postpartum body weight was found among 76 (8.4%) subjects. About 416 (46.2%) had postpartum bodyweight of < 40 kgs and 408 (45.3%) had 40-60 kgs. [13] A substantial number of cases and controls had habits of tobacco 73 (2.33%) and 181 (30.1 %) respectively. The difference in distribution of cases and controls in relation to maternal age, parity, height and postpartum maternal body weight was found to be statistically significant (P<0.05). A significant association was found between inter-pregnancy interval of <18 months and birth weight of baby (P<0.05).

Discussion

This case control study was done to identify the maternal risk factors associated with the low birth weight babies. In present study, 300 low birth weight and 600 normal birth weight babies mothers were asked questions (sample size low birth weight: normal birth weight 1:2 ratio).This study was carried out in a tertiary care hospital where many of the pregnant women are referred from the peripheral centers. In this study birth weight of babies was significantly association with illiteracy, primary and secondary education status of mothers. Hence maternal education showed inverse relation to birth weight of baby. [14]Mothers with lower educational status were at more risk of delivering low birth weight babies compared to mothers with higher

educational status. Low educational status of mother leads to low health consciousness, lower nutritional status and low antenatal attendance leading to the increased risk of LBW babies. The overall proportion of LBW found in it was 23.8% which is more than national prevalence. Finding of our study is also consistent with the findings of Tyagi et al [11] (1985), Hirve and Ganatra 14 (1994), Malik et al [15] (1997), and Deswal et al [17] (1999). Deshmukh et al [16] (1998), Idris et al 3 (2000), Joshi and Pai18 (2000) Dasgupta et al 19 (2004) found higher percentage (>30%) of low birth weight compared to present study. A study done by Dasgupta et al (2004) for kolkatta and Idris et al [3] (2000) carried out hospital based studies in setting similar to present study and found significant association between low maternal education and LBW similar to present study. Roleof maternal education on birth weight has been revealed even in other studies by Joshiand Pai (2000), Biswas et al (2008) and Gupta et al (2008). Amin et al (1993), Malik et al 15 (1997), Deswal et al [17] (1999) revealed no association between maternal education and birth weight of baby. Mollar et al in his study have shown that maternal weight 24 hour postpartum was equal to pre-pregnancy weight of mothers. The finding of maternal stature and maternal postpartum body weight as a significant risk factors for LBW is consistent with the studies done by Saigal and Srivastava 20 (1969), Ghosh et al 10 (1977), Fedric and Adelstein 29 (1978), Dougherty and Jones 30 (1982), Tyagi et al 11(1985), Arora et al (1987), Mavalankar et al (1994), Dhall and Bagga 27(1995), Deshmukh et al 16 (1998), Sharma et al 4 (1999), Ghate et al 36 (2000), Sachdev (2001), Chhabral et al (2004), Khatun and Rahman(2008), Sargoor et al (2009). Kamaldoss et al 23 (1992), Amin et al (1993), Malik et al 15 (1997) Deswal et al 17 (1999) revealed no significant association between maternal height, maternal weight and low birth weight. If it is assumed that this relationship is causative, substantial improvement in birth weight of babies can occur by enhancing coverage of antenatal care by early registration of pregnancy. Das et al (1981), Makhija (1988), Kogan et al(1994), Gawande et al 994), Malik et al 15 (1997), Anand and Gang (2000) found that the birth weight of babies seemed to be influenced significantly by the timeof registration in ANC by the mother. While Kamaldoss 23 (1993) did not find any significant association. Mothers of 22% cases and 9% controls had interpregnancy interval of less than 18months. Mothers of 30% controls and 20% cases had interpregnancy interval between 18-24 months. A highly significant association was found between interpregnancy interval of less than 18 months and birth weight of baby. The findings of present study emphasizes the need for improving the quality and utilization of antenatal care, nutritional education to improve the predelivery body weight, spacing,

avoidance of strenuous work during pregnancy, prevention and proper management of risk factor like anemia along with improving socioeconomic and educational status of mothers

Conclusion

Many factors like illiteracy and primary secondary education of mother, maternal occupation like coolie and agricultural workers, class III and IV socioeconomic status, maternal height < 145cms, maternal postpartum body weight <40 kgs, severe anaemic status, moderate activities of mother, time of registration above 20 weeks of gestational age and interpregnancy interval of less than 18 months were found to be significantly associated with low birth weight.

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