International Journal of Innovative Research in Medical Science (IJIRMS)
Volume 02 Issue 05 May 2017, ISSN No. – 2455-8737
Available online at - www.ijirms.in

Open Access Journal | Research Article | DOI: 10.23958/ijirms/vol02-i05/11

Effect of Socioeconomic Status and Birth Weight in Infants

Farah Mansoor[1], Elizaveta Nikolaevna Vitkovskaya[2], Jehan Yousif[3], Musleh Uddin Kalar[*4], Effa Mujeeb[5]

[1]Department of Medicine, Sind Medical College, Dow University of Health Sciences, Pakistan
[2]Department of Medicine, Kuban State Medical University, Russia
[3]Faculty of Health, York University, Canada
[*4]Department of Community Health Sciences, Karachi Medical and Dental College, Pakistan
[5]Department of Community Health Sciences, Karachi Medical and Dental College, Pakistan

Abstract

Background: *Previous studies have shown that low socioeconomic status has strong influence on birth weight of newborn. Evidence has shown that as the level of socioeconomic status increases the incidence of low birth weight decreases, so socioeconomic status has direct influence on birth weight. Low birth weight (LBW) is of concern because it is associated with infant and fetal mortality. In this study we evaluated different economic, nutritional and systemic variables of the mothers which lead to low birth weight of the baby.*

Method: *This was a descriptive cross sectional study that determined different socioeconomic factors leading to low birth weight. The study was conducted at National Institute of Child Health (NICH), Karachi. Mothers of 104 low birth weight newborns were interviewed by a self-designed questionnaire in the study.*

Result: *Results show that 68.3% women who gave birth to LBW baby were married at the age of 18 years or below. Results also showed that 77.9% were anemic during pregnancy and 51.9% women did not increase their meals during pregnancy. Remaining 62.5% women had consanguineous marriage.*

Conclusion: *In this study we found that young age at the time of marriage, consanguineous marriage, poor nutrition and anemia during pregnancy are greatly significant for low birth weight of baby. We strongly recommend that steps must be taken to prevent early marriages in our society, education of the mothers and provision of good prenatal and antenatal care.*

Introduction:

One of the important criteria for healthiness and well-being of children is growth status and growth pattern[1] The analysis of growth patterns and the detection of aberrant growth patterns provide crucial information for the detection of pathologic condition. So growth and maturation of children is sensitive index of health and is influenced by many factors.[2,3]

Low birth weight (LBW) is introduced as a birth weight of a live born infant of less than 2,500 gram.[4] Some low birth weight babies are healthy, even though they're small. But being low birth weight can cause serious health problems for some babies. Low birth weight is outcome of multifactorial factors like wise conditions affecting maternal health as chronic pathologies high blood pressure, diabetes and heart, lung and kidney problems other conditions like preterm labor infections, smoking, alcohol[5] and last but not the least women of low socioeconomic status which are at increased risk for delivering low birth weight babies due to poor nutritional status and lesser care during pregnancy, these all conditions can lead to LBW by causing either of these conditions. Premature birth is defined as birth before 37 weeks of pregnancy and fetal growth restriction. The clinical impression is that LBW children are often underweight and shorter than expected even when corrected for gestational age.[6] Babies born with low birth weight may be more likely than babies born at a normal weight to have certain medical conditions later in life. These include high blood pressure, diabetes and heart disease.[7]

The focus of public health authorities on low birth weight has been justified for a number of reasons. Firstly, at the individual level, reduced birth weight is an important risk factor in infant mortality; those born with a weight of less than 2,500 grams are at a greater risk of dying within first year of their life whether socioeconomic status is defined by income, occupation, or education. Education may also have independent effects, above and beyond income, because more highly educated mothers may know more about family planning and healthy behaviors during pregnancy.

Effects of social factors on the growth rate of children were presented by P founder (1916) for the first time. They observed urban children were taller and grow faster than

DOI: 10.23958/ijirms/vol02-i05/11

rural peers.[8] and Studies revealed that large number of social-economic variables is associated with the physical development of children. These variables are consisting of parental profession, income, education birth order, family size, and urbanization.[9-13] In this study, we determine the association between low birth weight and socioeconomic status so that in future we can prevent poor fetal outcomes due to low birth weight.

Method

The study was a descriptive cross sectional survey conducted at national institute of child health (NICH), Jinnah Post Graduate Medical Center, Karachi. A total of 104 participants were taken and the targeted population was mothers of newborns born with low birth weight. The technique applied for the sampling purpose was a non-probability convenience sampling.

The inclusion criteria were all mothers who gave birth to low birth weight babies and the exclusion criteria were language barrier and non-respondents.

Self-designed questionnaires containing 30 close ended questions were used for data collection by personal interviews and the main variables were family income, age below 18 at time of marriage, gap between present and previous child and increased number of meals during pregnancy. SPSS version 20 was used to analyze and calculate frequency and percentages for categorical variables, mean and standard deviation for numerical variables and chi square was taken to establish an association between the categorical variables. P-value of <= 0.05 was taken as statistically significant. Informed consent was taken from the participants before their enrolment in the study. Participants were chosen voluntarily and no financial incentive was given to them and special care was given to the confidentiality of the information provided by the participants.

Tables and Charts

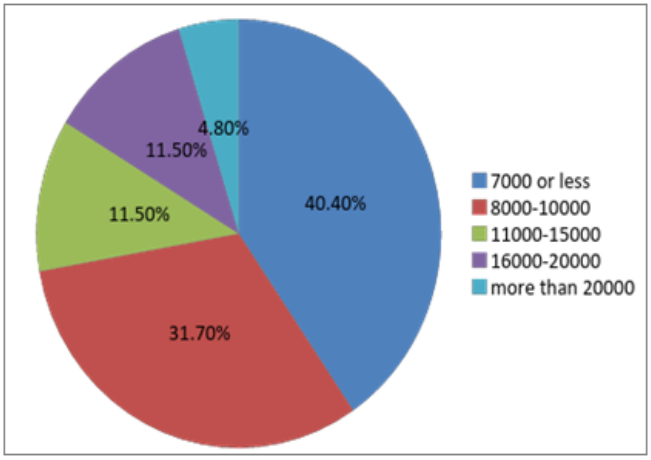

Figure 1: Frequencies of family income of the participants

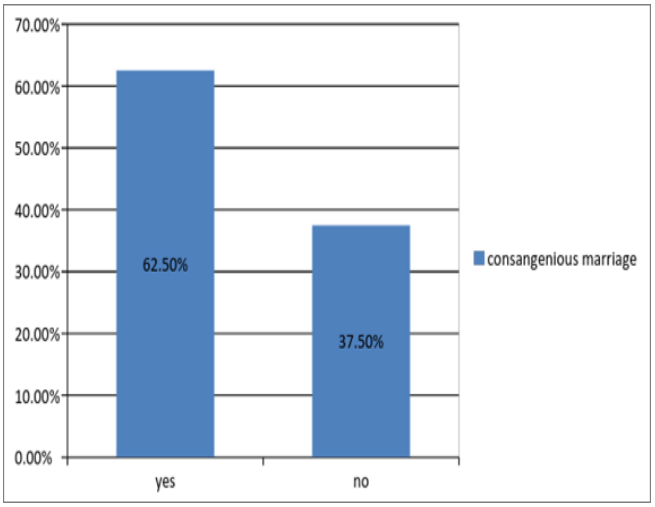

Figure 2: Frequencies of women who had consangenious marriage

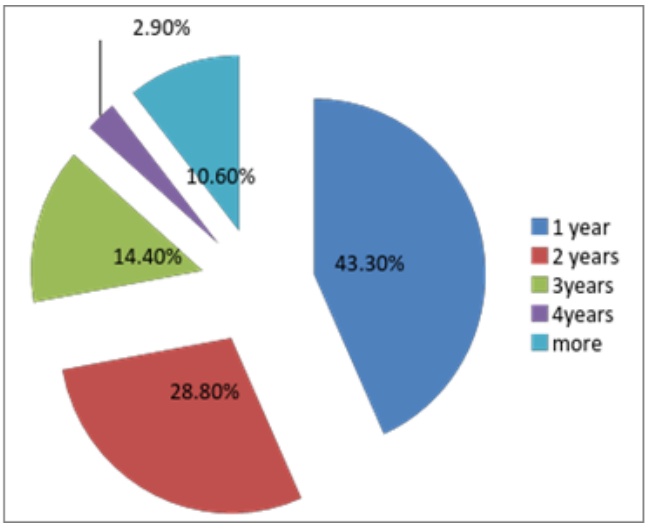

Figure 3: Frequencies of inter pregnancy intervals women had

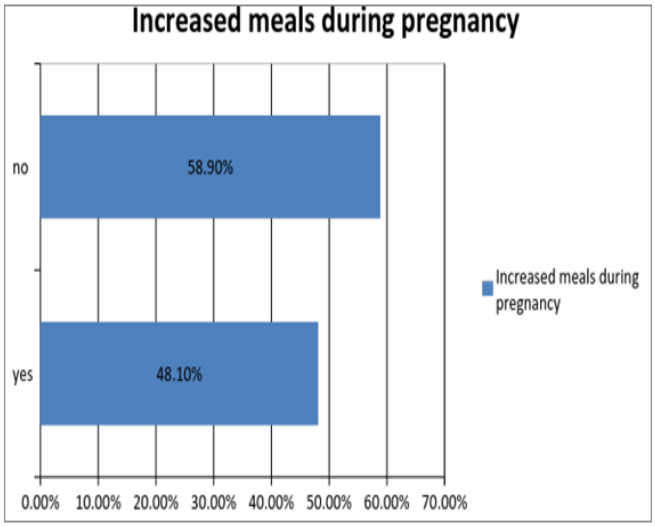

Figure 4: Frequencies of mothers who increased their meals during pregnancy

DOI: 10.23958/ijirms/vol02-i05/11

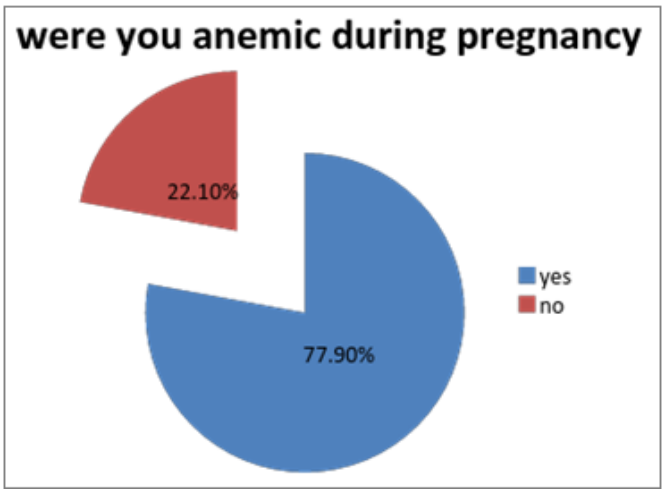

Figure 5: Frequencies of mothers who suffered from anemia during pregnancy

Result

All multipara females who gave birth to low weight babies participated in this research. Majority of women 68.3% went through normal vaginal delivery, whereas 23.1% and 8.7% had C- section and instrumental delivery respectively. Majority of the mothers belonged to poor families as 72.1% women's monthly family income was below 10,000 Pak rupees. About 20.2% of the women had 4 members, 30.8% had 6, 19.2% had 8, 14.4% had 10 and 15.4% had more than 10 members in their family. It was found that women living in rural areas had more family members (72.8% women living in rural areas had 10 or more family members).

When asked about inter pregnancy interval 43.3% had taken inter pregnancy interval of 1 year or less and 28.8% had taken interval of 2 years or less whereas 14.4%, 2.9% and 10.6% had had intervals of 3, 4 and more than 4 respectively. Most of the women delivered at hospital (76% deliveries at hospital and 24% deliveries at home).77.9% of the mothers were anemic during their pregnancy.

When asked about any clinical visits during pregnancy, 78.8% answered in affirmative. The diet also played a part in low weight babies as 51.9% of women did not increase their meals during pregnancy.31.7% of the mothers used to take milk regularly while 28.8% & 39.4% used to take milk once in a week and once in a month respectively. Similarly 14.4% of women used to eat meat daily whereas 53.8% and 31.8% consumed meat once in a week and once in a month respectively.

When interviewed about the co-morbids, 76.9% of women replied in negative for HTN, 96.2% of mothers replied in negative for diabetes and 90.4% didn't had TB during last 2 years. The effect of smoking wasn't very appealing as 94.2% of women didn't smoke during pregnancy. The past obstetric history did affect these pregnancies as 40.4% of mothers had delivered low weight babies previously.

When we compared different variables it was found that 51 out of 71 mothers who got married at/below the age of 18 were also anemic during pregnancy and 38.5% of the total women(40 out of 104) were those who got married at or below the age of 18 years and had done consanguineous marriages.

Discussion

The causes of LBW has been the focus of a vast number of investigations over the last few decades. The effect of socioeconomic disadvantage on low birth weight has been well established.[14-16] Our study demonstrates effect of many factors on birth weight mainly including family income, number of family members, parity, small age at the time of marriage, anemia during pregnancy, diet during pregnancy, inter pregnancy intervals and previous low weight deliveries.

The problem is most common among poor families as the family income of majority of the mothers (72.1%) was below 10,000 PKR. This result is consistent with the previous research which states that as the median family income of an area decreased, its percentage of low birth weight increased. [17]

Inter pregnancy interval and previous low weight deliveries seemed to affect the birth weight in decent amount as 43.3% (n=45) had taken intervals of 1 year or less and 40.4% (n=42) had given birth to low weight deliveries previously. This is comparable to previous researches that reported that low inter pregnancy interval is associated with poor fetal outcomes including low birth weight.[18, 19]

Despite the fact that nutrition requirement is increased during pregnancy majority of the mothers didn't increase their meals during their pregnancy that might have led to low weight newborns. Maternal nutrition effect on birth weight has been reported in many studies. [20]

Past studies show that Blood Pressure (Diastolic) during gestational age is strong risk factor for LBW.[21] However the relationship between hypertension and low weight of newborn wasn't convincing as 96.2% weren't hypertensive. This could be due to short number of participants in the study or HTN could have gone undiagnosed. However most of the women (77.9% n=81) were anemic during their pregnancy which proves anemia during pregnancy as one of the most important culprits for low birth weight. Lower birth weights in anemic women have been reported in several studies.[22-23]

Ironically the rate of consanguineous marriages in these mothers of low weight babies was high, as 62.5% of the women got married to their cousins. It is difficult to explain the reason for this surprising finding that we collected but it

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is certainly an interesting prospect for future research. Secondly there was found to be a relation between consanguineous marriage and early marriage as 38.5% of women were those who got married at 18 years or below of age and did consanguineous marriage. So, consanguineous marriage could be one of the main reasons for early marriage.

Consistent with another research which reported that as the social area deteriorated, the incidence of mothers at risk for low birth weight on the basis of being less than 17 years of age and on the basis of inadequate prenatal care increased[24] our study also showed that out 75 mothers whose monthly family income was less than 10,000 PKR, 52 got married at the age of 18 or below.

Many studies have been conducted relating maternal smoking and low weight newborn stating that cigarette smoking during pregnancy is a strong dose-dependent risk factor for LBW.[25-26] But we were unable to find this association as most of mothers didn't smoke during pregnancy.

Finally, there are a few limitations of this study. Firstly the participants belonged to different races, a factor which was excluded and second was the language barrier in many patients which might have influenced the study.

Conclusion

Socioeconomic factors do affect the pregnancy outcome with disadvantageous factors like lack of education, low family income, and more number of family members leading to low weight of the newborn. Women belonging to poor families are more likely to be anaemic during their pregnancy and this is in part due to lack of prenatal care. Women getting married at younger ages are prone to deliver low weight babies and the risk of being anaemic during pregnancy in these young mothers is also elevated. Therefore a holistic approach is needed to address the issue of early marriages in our society and strong actions are needed to be taken to spread the awareness of good antenatal care in the mothers.

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Corresponding Author -

Musleh Uddin Kalar
Department of Community Health Sciences, Karachi Medical and Dental College, Pakistan

DOI: 10.23958/ijirms/vol02-i05/11