***Original article:***

# Observation of Birth Weight of Babies in relation on maternal age, parity and gestational age in Tertiary Level Hospital

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## Abstract

***Background:*** Birth weight of an infant is the most important determinant of its chances of survival, healthy growth, and development. It depends on many maternal factors. Maternal age, parity and gestational age have been shown to increase the risk of adverse neonatal outcome, such as intrauterine growth retardation, prematurity, mortality and low birth weight. ***Objective:*** This study was planned to observe the incidence of low birth weight baby and to correlate the maternal age, parity and gestational age on birth weight of babies**.** ***Methodology:*** It was a retrospective study. Data were collected from medical records. Total 2850 live births new born baby were enrolled in this study during the period January 2013 to December 2018 in Ibn Sina medical college and hospital, Dhaka, Bangladesh with inclusion criteria. The weights of the newborns were measured without clothes on a digital weighing scale soon after the birth. Parameters such as birth weight, gender of baby, maternal age, parity and gestational age of the mother were noted. Data were analyzed statistically**.** ***Results:*** 52.99% baby was male and 47.01% were female. Low birth weight baby were 33.3% in the age group of less than 18 years of aged mother. With increasing the age of mother, birth weight of babies increase. Primipara mother delivered 15.52% low birth weight baby and 84.48% normal birth weight baby. With increasing parity birth weight of baby increased. The birth weight of <2.5 kg was 19.27% and 80.73% baby's birth weight >2.5 kg in mother more than 37 weeks of gestation. Baby born by 35-37 weeks of gestation had 27.69% low birth weight and 72.31% were normal birth weight. Incidence of low birth weight was 79.3% and normal birth weight 20.7% found by 32-34 weeks of gestation.

**Keywords:** Birth weight; gender; maternal age; parity and gestational age of mother.

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## Introduction:

Birth weight of an infant is the most important determinant of its chances of survival, healthy growth, and development. It depends on many maternal factors. Good maternal health and nutrition are important contributors to child survival[1]. A healthy mother delivers a healthy baby and a malnourished mother contributes to low birth weight baby. Parity and gestational age have been shown to increase the risk of adverse neonatal outcome, such as intrauterine growth retardation, prematurity and mortality. Several studies have hypothesized that young mothers, maternal-foetal competition for nutrition and or mothers incomplete physical growth might contribute an adverse neonatal outcome[2].Birth weight is a critical determinant for neonatal morbidity

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and also for the growth and development of the infant in the early neonatal period. Birth weight depends on both maternal and foetal genetic constitution as well as other variable such as socioeconomic status, nutritional supplements, bad obstetric history, maternal weight and height and maternal illness. Low birth weight is a significant contributor's factor for increased risk of infant mortality and morbidity [3] and has a health consequence extending into adulthood[4]. Low birth weight is defined as birth weight has less than 2500 gm at birth[5,6]. In Bangladesh, both growth rate and low birth weight rate are quite high[7]. Neonatal survival depends on both gestational maturity and birth weight and are not significantly better in babies who are low birth weight for gestational age[8]. Increased perinatal and infant mortality are major health problem in a developing country. Perinatal mortality is known to be particularly high in infant with low birth weight. Different workers throughout the world have been working in this field and have determined risk factors present in their local areas. Due to wide variation, factors operating in one region may not be applicable to other parts of the world or nation. Study of birth weight has remained as an important field of research for effective maternal and child health care programmes. This study was planned to observe the incidence of low birth weight baby among institutional deliveries in Ibn Sina Medical College and to correlate the maternal age, parity and gestational age on birth weight of babies.

## Materials and Methods

It was a retrospective study. Data were collected from medical records. Total 2850 live births new born baby were enrolled in this study during the period of January 2013 to December 2018 in Ibn Sina medical college and hospital, Dhaka, Bangladesh. Three inclusion criteria were used in this study. (a) Singleton live born baby by LUSC (b) Baby did not suffer from any congenital malformation (c) Gestational age of the mother is 32 to 41 weeks. The weights of the newborns were measured without clothes on a digital weighing scale soon after the birth. Parameters such as birth weight, gender of baby, maternal age, parity and gestational age of the mother were noted. Gestational age in weeks was assessed by either ultrasound examination or according to mothers last menstrual period or both. Data were analyzed statistically.

**Ethical clearance**: This study was approved by ethic Committee of Ibn Sina Medical College Hospital.

## Result:

**Table -1A: Distribution of birth weight according to gender**

| Birth weight | Sex | No. of Baby | Percentage |
|---|---|---|---|
| <2.5 Kg | Male | 225 | 14.9% |
| | Female | 220 | 16.41% |
| >2.5 Kg | Male | 1285 | 85.09% |
| | Female | 1120 | 83.58% |

**Table 1 B: Distribution of birth weight according to weight**

| Birth weight | No. of Baby | Percentage |
|---|---|---|
| <2.5 kg | 445 | 15.61% |
| >2.5 kg | 2405 | 84.38% |

Gender distribution of the respondents summarized in table1A. The result showed that male baby was52.98%, of which 14.9% baby's birth weight <2.5 Kg & 85.09% baby's birth weight >2.5 Kg. Female baby in this study was 47.01%, of which 16.41% birth weight <2.5 Kg and 83.58% birth weight >2.5 Kg (Table1A) .The study also showed low birth weight (<2.5kg) was 15.61% where as normal birth weight (>2.5 kg) were 84.38% irrespective of gender(Table: 1B)

**Table-2: Distribution of maternal age with baby's birth weight**

| Maternal age | No. of baby | Birth weight | |
|---|---|---|---|
| | | <2.5 Kg | >2.5 Kg |
| <18 years | 38 | 33.3% | 66.7% |
| 18-24 years | 842 | 12.6% | 87.4% |
| 25-29 years | 1150 | 15.6% | 84.4% |
| 30-34 years | 657 | 14.6% | 85.4% |
| >35 years | 162 | 21.0% | 79.0% |

Maternal age with birth weight of babies were summarized in table:2. The result showed that the young mother <18 years age delivered 33.3% low birth weight baby (<2.5 kg) and 66.7% normal birth weight baby (>2.5 kg). The incidence of low birth weight in age group of mother from 18-24 years, 25-29years, 30-34 years and >35 years were respectively 12.6%, 15.6%, 14.6% and 21.0%.The result also showed normal birth weight baby(>2.5kg) were respectively 87.4%,84.4%,85.4% and 79.0% in the age group of mother from 18-24 years, 25-29years, 30-34 years and >35 years.

**Table-3: Distribution of birth weight to parity**

| Parity | No. of baby | Birth weight | |
|---|---|---|---|
| | | <2.5 Kg | >2.5 Kg |
| 1st | 1237 | 15.52% | 84.48% |
| 2nd | 899 | 13.90% | 86.10% |
| 3rd | 338 | 19.23% | 80.77% |
| 4th | 156 | 14.10% | 85.90% |
| 5th | 40 | 20% | 80% |
| 6th | 14 | 7.14% | 92.86 |

Table-3 showed the relationship between birth weight & parity of mother. The result showed that primipara mother delivered low birth weight baby (<2.5 Kg) were 15.52% and normal birth weight babies (>2.5 kg) were 84.48%. The incidence of low birth weight(<2.5 Kg) were respectively 13.90%,19.23%,14.10%,20% and 7.14% in parity of 2nd, 3rd, 4th, 5th and 6th.The result also showed that normal birth weight babies (>2.5 kg) were 86.1%, 80.77% , 85.9%, 80.1% and 92.86% were respectively found in parity of 2nd, 3rd, 4th, 5th and 6th

**Table:4 –Distribution of birth weight according to gestational age of mother**

| Gestational age in weeks | Percentage of baby | birth weight | |
|---|---|---|---|
| | | <2.5kg | >2.5 kg |
| >37 weeks | 67.29% | 19.27% | 80.73% |
| 35 37 weeks | 27.02% | 27.69% | 72.31% |
| 32-34 weeks | 5.51% | 79.3% | 20.7% |

Birth weight of the baby according to gestational age of the mothers was observed in table-4. Result showed that 67.29% baby born by more than 37 weeks of gestation of which 19.27% baby's birth weight <2.5 kg and 80.73% baby's birth weight >2.5kg. 27.02% babies had born by 35-37 weeks of gestation of which, 27.69% birth weight <2.5kg and 72.31% baby's birth weight>2.5 kg. 5.51% babies had born by 32-34 weeks of gestation of which, 79.3% birth weight <2.5kg and 20.7% baby's birth weight >2.5 kg.

## Discussion:

In our study 52.98% baby were male of which low birth weight baby were 14.9% and normal birth weight baby were 85.72%. Female baby, in this study were 47.01% of which 15.62% baby's birth weight <2.5kg and 83.70% baby's birth weight >2.5kg. Narwade RG etal[9] found in his study that 21.47% female baby were low birth weight and 15.87% male baby had birth weight <2.5kg[9].The gender incidence and birth weight of baby is nearly similar to other study by Bharati Petol and Mondol Beta etal[10,11]. In my study low birth weight were 15.61% where as birth weight >2.5kg were 84.38%.It is consistent with the findings of Narwade RG etal[9]. Ashtekar SV et al[12] found in his study that 18.99% baby was low birth weight in 1994, 17.34%, in 1997 and 19.35% in 2002. Manzur K etal[13] showed in his study that incidence of low birth weight irrespective of sex were 20%.

In this study maternal age with birth weight of babies showed low birth weight baby <2.5kg were 33.3% in age group of mother <18 years and normal birth weight >2.5kg were 66.67%.Incidence of low birth weight babies decreases in the age group of mother 18-34 years. The study also showed that normal birth weight baby >2.5kg were more observed in the age group of 18-30 years. K.Selina and R Mahbub et al[14] found in their study that low birth weight baby belongs to mother age group of <19 years and >30 years. Narwede et al[9] found in his study that with increase age of mother >20 years and <35 years incidence of normal birth weight is more.The study also similar to the result done by Asthekar VS etal[12].The study also similar to KS Negi partigum, Tabeharen etal[15],where maternal age <20 years has higher incidence of low birth weight baby. Mother who deliver normal birth weight baby >2.5kg majority belongs to the age group of 20-29 years.

In this study primipara mother delivered 15.52% baby <2.5kg and 84.48% >2.5kg. The incidence of low birth weight (<2.5 kg) were gradually decreased in 2nd, 3rd, 4th ,5th and 6th parity of mother. Simran B. S Amitav, M Dilip etal[16] found in their study that rate of low birth weight were decrased significantly with increased parity. Prudhivi.S, Bhosgi R etal[17] found in their study that 42% multipara mother delivered baby with birth weight <2.5kg. S Mukherjee, Mohasin, Datta, Banik and Khin Nyunt etal[18-21] found in their study that with increased parity birth weight of baby increase. Khueua, Bachani etal[22,23] also showed similar result in their study.

In my study normal birth weight >2.5kg were found 86.1%,80.77%, 85% , 80.9% in the parity of 2nd, 3rd , 4th ,5th and 6th parity of mother. In a study, reported by Samta G.Ila. G. Jitesh and Katari SK etal[24] found that low birth weight baby <2.5kg were 23.84%, normal birth weight >2.5kg were 64.9% in primipara and in Multipara 62.18% have normal birth weight and 23% were low birth weight.

In my study 67.29% baby born by more than 37 weeks of gestation of which 19.27% baby were < 2.5 kg and 80.73% baby's birth weight > 2.5 kg. 27.02% baby born by 35 – 37 weeks of gestation where 27.69% baby's birth weight < 2.5kg and 72.31% baby birth weight > 2.5 kg. 5.51% baby had born by 32–34 weeks of gestation of which 79.3% baby birth weight <2.5 kg. G.Samta , G.ILa , G.Jitesh etal[24] found in their study that in pre term delivery 29.9% baby had normal birth weight, 45.19% were low birth weight and 14.68% were very low birth weight and in term delivery incidence of low birth weight were 2.6% and normal birth weight were 72.16%, very low birth weight were 1.2% . Shah UP etal[25] reported that incidence of low birth weight was lower than normal birth weight in full term baby and the incidence of low birth weight was higher than normal birth weight in pre term baby. Both the study is nearly similar to our study.

## Conclusion:

The study concluded that as the age of mother increases birth weight of baby increases, as the parity increases birth weight of the baby increases. The study concluded that problem of low birth weight is multi dimensional hence we need integrated and comprehensive approach to improve the overall health of women. To reduce the incidence of low birth weight following steps can be taken a) Health education to adolescent regarding the nutrition and marriage) Health education to married women regarding nutrition and age of first pregnancy) Heath education to pregnant mother regarding the nutrition) Regular antenatal care, birth spacing and family planning.

**Conflict of interest:** None declared

## Authors' contribution:

Data gathering and idea owner of this study: Ali MK, Quarashi MSA, Sultana S, Rahman MZ

Study design: Ali MK

Data gathering: Ali MK, Quarashi MSA, Sultana MS

Writing and submitting manuscript: Ali MK, Quarashi MSA

Editing and approval of final draft: Ali MK, Quarashi MSA, Sultana S, Rahman MZ

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