

The Correlation between Maternal Factors and Infants Lower Birth Weight

Dr. Mohammad Abujer Rahman^{1*}, Dr. Porimol Roy¹, Dr. Md. Abdullah-Hel-Baki², Dr. Kawser Ahmed³, Dr. Bipasha Roy⁴, Dr. Ashutosh Dev Sharma⁵, Dr. Shiladitya Shil⁶

¹Junior Consultant (Pediatric), 250 Bedded General Hospital, Dinajpur, Bangladesh

²Senior Consultant (Anaesthesiology), 250 Bedded General Hospital, Dinajpur, Bangladesh

³Assistant Professor (Anesthesiology), Sheikh Hasina Medical College, Habiganj, Bangladesh

⁴Medical Officer (Paediatric), 250 Bedded General Hospital, Dinajpur, Bangladesh

⁵Senior Consultant (Gynae & Obs), 250 Bedded General Hospital, Dinajpur, Bangladesh

⁶Senior Consultant (Surgery), 250 Bedded General Hospital, Dinajpur, Bangladesh

DOI: [10.36347/sjams.2023.v11i07.017](https://doi.org/10.36347/sjams.2023.v11i07.017)

| Received: 22.05.2023 | Accepted: 03.07.2023 | Published: 17.07.2023

*Corresponding author: Dr. Mohammad Abujer Rahman

Junior Consultant (Pediatric), 250 Bedded General Hospital, Dinajpur, Bangladesh

Abstract

Original Research Article

Background: Low birth weight (LBW) continues to remain a major public health problem worldwide. There are numerous factors contributing to LBW both maternal and fetal. The mortality of low birth weight can be reduced if the risk factors are detected early and managed by simple techniques. **Objective:** In this study our main goal is to assess the correlation between maternal factors and infants lower birth weight. **Method:** This research was conducted as a cross-sectional analysis at a tertiary care medical facility between January 2022 and January 2023. Where a convenience sample of 100 moms aged 11–19 who were hospitalized throughout the research period was chosen. Ultrasound and other diagnostic procedures verified the pregnancy. **Results:** During the study, the average age of the participants in the study group was 18.02 ± 05 years, and only 19% of the patients visited the antenatal care facility more than four times. Among the study group, 34% of the participants had anemia, followed by 20% with premature rupture of membranes (PROM), 6% with preterm premature rupture of membranes (PPROM), 11% with mild eclampsia, 7% with severe eclampsia, 5% with gestational hypertension, and 6% with gestational diabetes. In terms of delivery methods, 40% had normal spontaneous vaginal delivery (NSVD), 28% had emergency lower segment cesarean section (LSCS), 17% had planned LSCS, and 13% underwent instrumental delivery. Regarding postpartum complications, 5% of the study group experienced postpartum hemorrhage (PPH), 2% had uterine atony, 3% had wound disruption, 1% had perineal tear, and 1% of the cases resulted in maternal death. Adverse neonatal outcomes were also observed, with 15% of the newborns having a body weight of less than 2500 grams, 11% having low APGAR scores, 12% developing neonatal jaundice, 2% experiencing intrauterine growth restriction (IUGR), 2% being stillborn, 1% having congenital anomalies, and 1% suffering from respiratory distress syndrome. **Conclusion:** From our study we can say that, adolescent pregnancy, parity, anemia, PROM, low ANC visit, hypertension, urinary tract infection, preterm delivery, multiple pregnancy was significantly associated with low birth weight compared to normal birth weight. Further studies can be undertaken by including large number of mothers & mothers delivering at home. **Keywords:** Adolescent pregnancy, pregnancy outcome, low birth weight.

Copyright © 2023 The Author(s): This is an open-access article distributed under the terms of the Creative Commons Attribution 4.0 International License (CC BY-NC 4.0) which permits unrestricted use, distribution, and reproduction in any medium for non-commercial use provided the original author and source are credited.

INTRODUCTION

Low birth weight (LBW) is a critical indicator of infant health and is associated with increased risk of mortality, developmental delays, and long-term health problems. LBW is defined as a birth weight of less than 2,500 grams (5.5 pounds), regardless of gestational age. It is a global public health issue, affecting both developed and developing countries [1-3].

The risk of LBW is influenced by various factors, including maternal characteristics, behaviors, and health status during pregnancy. Maternal factors play a significant role in determining fetal growth and development, as the intrauterine environment directly affects the supply of nutrients and oxygen to the developing fetus.

Several maternal factors have been extensively studied for their correlation with the risk of LBW.

Citation: Mohammad Abujer Rahman, Porimol Roy, Md. Abdullah-Hel-Baki, Kawser Ahmed, Bipasha Roy, Ashutosh Dev Sharma, Shiladitya Shil. The Correlation between Maternal Factors and Infants Lower Birth Weight. Sch J App Med Sci, 2023 Jul 11(7): 1301-1305.

These factors include maternal age, socioeconomic status, education level, nutritional status, tobacco smoking, alcohol and substance use, maternal stress, and pre-existing medical conditions such as hypertension and diabetes. Each of these factors can independently or collectively influence fetal growth and contribute to the risk of LBW [4-6].

Understanding the correlation between maternal factors and the risk of LBW is crucial for identifying at-risk populations and implementing targeted interventions. By identifying the modifiable risk factors, healthcare professionals and policymakers can develop effective strategies to improve maternal health, enhance prenatal care, promote healthy behaviors during pregnancy, and ultimately reduce the prevalence of LBW.

This introduction aims to explore the existing literature on the correlation between maternal factors and the risk of LBW. By synthesizing the findings from various studies, we can gain a comprehensive understanding of the maternal factors that have been studied and their implications for the risk of LBW. Such knowledge can inform evidence-based interventions and policies that prioritize maternal health and contribute to better birth outcomes for newborns [7, 8].

OBJECTIVE

To assess the correlation between maternal factors and infants lower birth weight.

METHODOLOGY

This research was conducted as a cross-sectional analysis at a tertiary care medical facility between January 2022 and January 2023. Where a convenience sample of 100 moms aged 11–19 who were hospitalized throughout the research period was chosen. Ultrasound and other diagnostic procedures verified the pregnancy. Following the definition of the study's goals, a data sheet and questionnaire form was developed to collect the necessary information. In order to identify any clinical symptoms and signs that could indicate or warn of a problem during pregnancy, birth, or the postpartum period, a detailed history and comprehensive physical examination were undertaken.

Statistical analysis was conducted using SPSS 22.0 (Statistical Package for the Social Science; IBM; Texas, USA). Frequency and percentage were used to represent the qualitative factors.

RESULTS

In table-1 shows demographic status of study group where mean age of the study group was 18.02±05 years. Followed by 65% were from rural area, 60% were illietrare, 80% were housewife and 55% had <10000 Tk in their family income. The following table is given below in detail:

Table 1: Demographic Status of the study group

Mean Age	Mean±SD	P value
	18.02±05	0.001
Resident Area	N, %	0.213
Urban	35(35%)	
Rural	65(65%)	
Educational status	%	0.001
Literate	40, 40%	
Illiterate	60, 60%	
Occupational status	%	1.21
Housewife	80, 80%	
Service holder	10, 10%	
Student	10,10%	
Monthly family income (monthly)	%	1.23
<10000 Tk	55,55%	
10001-20000 Tk	45,45%	

In figure-1 shows ANC visit of the patients where only 19% patients visit ANC >4 times. The following figure is given below in detail:

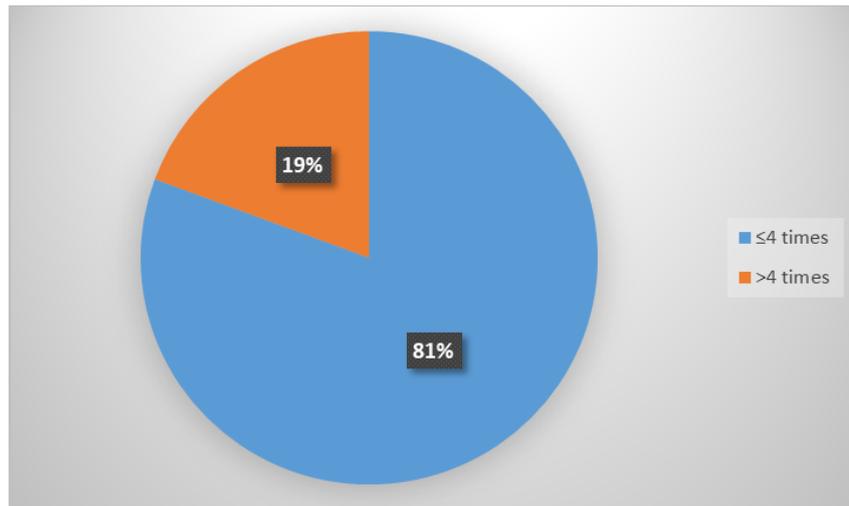


Figure 1: ANC visits

Table-2 shows maternal clinical status where 34% had anemia, followed by 20% had PROM, 6% had PPROM, 11% had mild eclampsia, 7% had severe

eclampsia, 5% gestational hypertension, 6% had gestational diabetes. The following table is given below in detail:

Table 2: Maternal clinical status

Clinical status	N, %	P value
Anemia	34, 34%	0.001
PROM	20, 20%	0.001
PPROM	6, 6%	1.20
Mild Eclampsia	11, 11%	1.11
Severe Eclampsia	7, 7%	1.12
Gestational Hypertension	5, 5%	1.11
Gestational Diabetes	6, 6%	1.20

In figure-2 shows mode of delivery where 40% had NSVD, followed by 28% had emergency LSCS, 17% had LSCS, 13% had instrumental delivery, 2% had

vaginal breech delivery. The following figure is given below in detail:

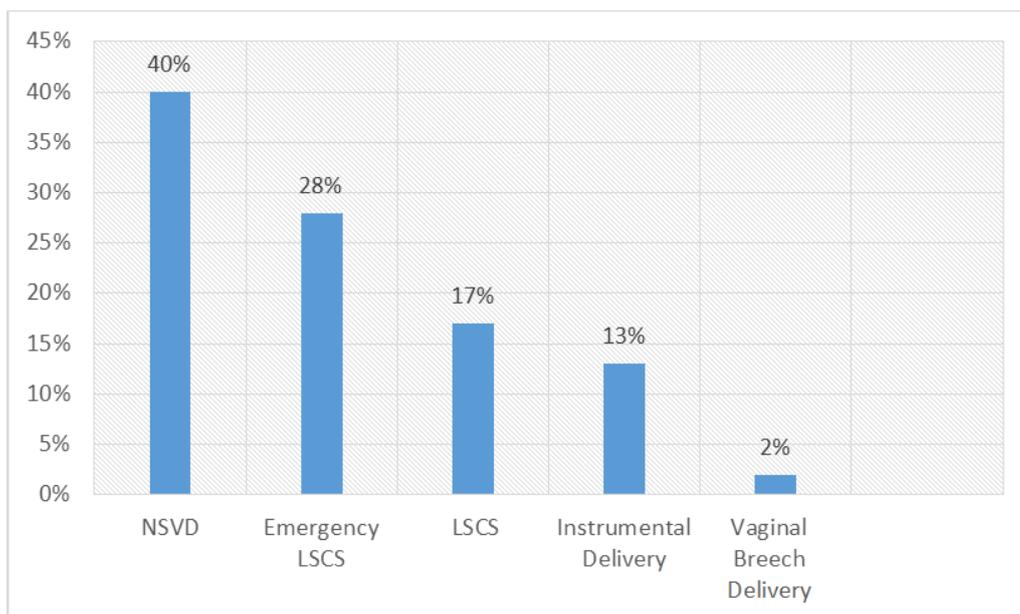


Figure 2: Mode of delivery

In table-3 shows postpartum complications of study group where 5% had PPH, 2% had uterine atony, 3% had wound disruption, 1% had perineal tear, 1%

cases was maternal death. The following table is given below in detail:

Table 3: Postpartum complications of study group

Postpartum complications	N %
PPH	5, 5%
Uterine Atony	2, 2%
Wound disruption	3, 3%
Perineal Tear	1, 1 %
Maternal death	1, 1%

In table-4 shows frequency of adverse neonatal outcome where 15% had < 2500 g body weight followed by 11% had APGAR Score, 12% had Neonatal Jaundice, 2% had IUGR, 2% had still birth,

1% had congenital anomalies, 1% had Respiratory Distress Syndrome. The following table is given below in detail:

Table 4: frequency of adverse neonatal outcome

Neonatal outcome	N, %
Body Weight < 2500 g	15, 15%
APGAR Score	11, 11%
Neonatal Jaundice	12, 12%
IUGR	2, 2%
Still Birth	2, 2%
Congenital Anomalies	1, 1%
Respiratory Distress Syndrome	1, 1%

DISCUSSION

In our study, mean age of the study group was 18.02±05 years. Which was similar to one study where mean age was 18.01±02 years [6].

In our study major complication was seen in maternal case. In Bangladesh the issues of perinatology and perinatal programme are mostly absent [7].

Unless the formative stage of human development is cured properly it cannot be expected human quality. Maternal nutrition is an important determinant of fetal growth, birth weight and infant mortality.

In our study, 34% had anemia, followed by 20% had PROM, 6% had PPRM, 11% had mild eclampsia, 7% had severe eclampsia, 5% gestational hypertension, 6% had gestational diabetes. Which quite similar to other study where anemic problem was higher [8].

In fact, it was found that, most of them had lower ANC visit and coming from lower economic status. Because of this, they didn't consume enough iron and folic acid supplement, which links low hemoglobin concentrations. Which was similar to our study where in our study only 19% patients visit ANC >4 times and majority had <10000 Tk in their family income.

In one study, the rate of cesarean section was higher in adult pregnancies compare with teenage pregnancies (33.7% vs. 18.5%). This may be attributed to the fact that older women delivered heavier babies than teenage girls; (6.1 lb. vs. 6.61) lb. It can be said that some factors such as gravidity and parity can influence some maternal outcome like cesarean section. Although the vaginal delivery was the major route of delivery in teenage mothers (45 %) in the study, however, teenage mothers had significantly higher emergency cesarean section (31.7%). This is because the indications for cesarean section reflected the non – reassuring for the maternal and fetal outcome of teenage mothers. Moreover, the high proportion of premature labor in the adolescent Pregnancies results to higher number of preterm babies among them [9-11].

Moreover, in our study we also noted that, 40% had NSVD, followed by 28% had emergency LSCS, 17% had LSCS, 13% had instrumental delivery, 2% had vaginal breech delivery.

In our study we also observed adverse neonatal outcome where 15% had < 2500 g body weight followed by 11% had APGAR Score, 12% had Neonatal Jaundice, 2% had IUGR, 2% had still birth, 1% had congenital anomalies, 1% had Respiratory Distress Syndrome. Which was similar to other studies where lower birth weight, neonatal jaundice, congenital anomalies were seen most [10-14].

CONCLUSION

Understanding the correlation between maternal factors and the risk of LBW is vital for identifying at-risk populations and implementing targeted interventions. By addressing modifiable risk factors through improved prenatal care, promotion of healthy behaviors during pregnancy, and enhanced support for maternal well-being, the prevalence of LBW can be reduced, leading to improved birth outcomes and long-term health benefits for infants. From our study we can say that, parity, anemia, PROM, low ANC visit, hypertension, urinary tract infection, preterm delivery, multiple pregnancy was significantly associated with low birth weight compared to normal birth weight. Further studies can be undertaken by including large number of mothers & mothers delivering at home.

Moreover, implementing evidence-based strategies, such as providing comprehensive prenatal care, promoting healthy lifestyle choices, and addressing social determinants of health, the healthcare system can work towards improving maternal health and reducing the incidence of LBW. Such initiatives can have a profound impact on the overall health and well-being of newborns, setting the foundation for a healthier future generation.

REFERENCES

- Chandra-Mouli, V., Camacho, A. V., & Michaud, P. A. (2013). WHO guidelines on preventing early pregnancy and poor reproductive outcomes among adolescents in developing countries. *Journal of adolescent health, 52*(5), 517-22.
- Akoh, C. C. (2017). Vitamin D, Infection, and Inflammation in Pregnant Adolescents.
- Darroch, J. E., Singh, S., & Frost, J. J. (2001). Differences in teenage pregnancy rates among five developed countries: the roles of sexual activity and contraceptive use. *Family planning perspectives, 244*-81.
- Maiden, K., Gunter, W. D., Martin, S. S., & Ehrental, D. B. (2014). Teen mothers, unintended pregnancies, and costs across Delaware. *Del Med J, 86*(4), 109-16.
- Kingston, D., Heaman, M., Fell, D., Chalmers, B., & Maternity Experiences Study Group of the Canadian Perinatal Surveillance System, Public Health Agency of Canada. (2012). Comparison of adolescent, young adult, and adult women's maternity experiences and practices. *Pediatrics, 129*(5), e1228-37.
- Nord, C. W., Moore, K. A., Morrison, D. R., Brown, B., & Myers, D. E. (1992). Consequences of teen-age parenting. *Journal of School Health, 62*(7), 310-318.
- Ganchimeg, T., Ota, E., Morisaki, N., Laopaiboon, M., Lumbiganon, P., Zhang, J., ... & WHO Multicountry Survey on Maternal Newborn Health Research Network. (2014). Pregnancy and childbirth outcomes among adolescent mothers: a World Health Organization multicountry study. *BJOG: An International Journal of Obstetrics & Gynaecology, 121*, 40-48.
- Fraser, A. M., Brockert, J. E., & Ward, R. H. (1995). Association of young maternal age with adverse reproductive outcomes. *New England journal of medicine, 332*(17), 1113-1118.
- Olausson, P. M., Cnattingius, S., & Goldenberg, R. L. (1997). Determinants of poor pregnancy outcomes among teenagers in Sweden. *Obstetrics & Gynecology, 89*(3), 451-7.
- Phipps, M. G., Blume, J. D., & DeMonner, S. M. (2002). Young maternal age associated with increased risk of postneonatal death. *Obstetrics & Gynecology, 100*(3), 481-6.
- Anjum, F., Javed, T., Afzal, M. F., & Sheikh, G. A. (2011). Maternal risk factors associated with low birth weight: A case control study. *Annals of King Edward Medical University, 17*(3), 223-223.
- Pawar, A., & Kumar, D. (2017). Maternal factors associated with low birth weight: a case control study in rural Kerala. *Int J Community Med Public Health, 4*, 3793-5. <https://doi.org/10.18203/2394-6040.ijcmph20174252>
- Khan, M. W., Arbab, M., Murad, M., Khan, M. B., & Abdullah, S. (2014). Study of factors affecting and causing low birth weight. *Journal of scientific research, 6*(2), 387-394. <https://doi.org/10.3329/jsr.v6i2.17090>
- Choudhary, A., Choudhary, A., Tiwari, S., & Dwivedi, R. (2013). Factors associated with low birth weight among newborns in an urban slum community in Bhopal. *Indian journal of public health, 57*(1), 20-23.