Original Article

Maternal & Perinatal Risk Factors Associated with Preterm Delivery-A Hospital Based Study

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ABSTRACT

Introduction: *Prematurity is the foremost cause of death in children, and in almost all countries, preterm birth is increasing significantly. It is the main clinical episode that can rework a normal pregnancy into a high-threat one for both the fetus and the mother. Preterm labours are caused by a combination of factors, including decidual bleeding and uterine deformation.* **Aim of the study:** *The study aimed to identify the maternal and perinatal risk factors associated with preterm birth.* **Methods:** *This cross-sectional study was carried out at the Department of Obstetrics and Gynecology, Chittagong Medical College Hospital, Bangladesh from January 2015 to June 2015. 100 mothers were enrolled in the study. A pre-designed questionnaire was used for data collection. Statistical analyses were performed by using the Statistical Package for Social sciences version 16.0 for Windows (SPSS 16).* **Result:** *Most of the mother's (61,61.0%) ages ranged from twenty-one to thirty. The majority of the mothers (62,62%) had multipara. Fifty-one mothers (51,51%) had a normal vaginal delivery & forty-nine mothers (49,49.0%) underwent caesarean section. Infection was the most prevalent maternal complication, present in fifty-three mothers (53,53.0%). Urinary tract infection (UTI) (30,30.0%) had the second highest prevalence. Among the ninety-nine neonates born alive in the present study, thirty-five neonates (35,35.0%) had respiratory distress syndrome, and thirty-three neonates had (33.33.0%) sepsis. Neonatal death was 61%, and the most common cause of neonatal death was septicemia, tailed by respiratory distress syndrome.* **Conclusion:** *Most of the patients did not receive a proper antenatal check-up. Infection and pre-eclampsia were the most common maternal complications. Septicemia and respiratory distress syndrome were the most common cause of perinatal death. The purpose of the prevention of the risk of preterm birth is subordinate to the objective of*

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enhanced perinatal morbidity and mortality

INTRODUCTION

Prematurity is the biggest cause of mortality in children, and preterm birth is on the rise in practically every country. It is the key clinical event that can turn a normally occurring pregnancy into a high-risk pregnancy for both the fetus and the mother. Preterm birth occurs when an infant is delivered before the 37th week of pregnancy. Preterm delivery impacted one out of every ten newborns in the United States in 2020. The preterm birth rate fell by 1% in 2020, from 10.25 percent in 2019 to 10.1 percent in 2020 [1]. Bangladesh has the highest percentage of preterm births with 19% of births occurring before gestational age week 37 in global comparison [2]. Preterm birth occurs in fifteen million of all pregnancies and is the most common reason for perinatal morbidity, and mortality universally [3]. To efficaciously lessen neonatal morbidity and death associated with prematurity, operative risk identification and behavioural change programs for preterm labour prevention may be required. In turn, this necessitates a better understanding of the psychological risk influence, aetiology, and courses of preterm labour and delivery [4]. Common causes of preterm birth include multiple pregnancies, infections, chronic conditions, decidual bleeding, cervical incompetence, uterine deformation, cervical inflammation,

maternal illness, hormonal shifts, drug addiction, and even excessive smoking [5] Tobacco, cocaine, and alcohol are enough for killing and sickening people, especially women during pregnancy and are the leading cause of preterm deliveries [6]. Preterm birth is a severe issue in modern obstetrics because of the technique of delivery [7]. The mode of delivery is determined by obstetric indications, the severity of maternal complaints, and the hospital's facilities. The mode of delivery recommended for preterm birth has remained an antagonistic matter that has so far to be resolved. The women with vaginal birth have less risk in contrast with the women who had a second-stage cesarean delivery [8]. The Asian and African sites had higher rates of preterm birth in the nulliparous women, it happened due to the higher percentage of women in Asia and Africa being <20 years of age and likely to have their first pregnancy in their early twenties. Another factor for higher risk for preterm birth was antepartum haemorrhage [9]. Children born with prematurity have several problems related to breathing difficulties, underdeveloped organs and vision problems. Bangladesh has the highest adolescent fertility rate in South Asia and women here, are in poor health and face stressful living situations such as domestic abuse, food insecurity, and the home environment. Despite tremendous

gains in human development, teenage childbearing persists in Bangladesh, owing mostly to a greater rate of child marriage. [10,11,12]. The documentation of susceptible women will aid in the improvement of a strategy for enhanced prenatal, antenatal, and intranational care, which will aid in the early detection and supervision of preterm delivery, as well as the decrease of perinatal morbidity and mortality, as well as maternal complications. The study aimed to identify the maternal and perinatal risk factors associated with preterm birth.

OBJECTIVE

The study intends to identify the maternal and perinatal risks associated with preterm delivery.

METHODS

This cross-sectional study was carried out at the Department of Obstetrics and Gynecology, Chittagong Medical College Hospital, Bangladesh. The study duration was 6 months, from January to June of 2015. The purposive sampling method was used. A total of 100 women were enrolled in the hospital. Informed verbal consent was attained from the participants before collecting data. Ethical clearance was also taken from the ethical review committee of the study hospital. Data were collected by interview, physical & lab examination using a structured questionnaire containing all the variables of interest. A pre-designed questionnaire was used for data collection.

Inclusion Criteria

- Delivered at Gestational age of 32-37 weeks
- Patients who had approved to participate in the study.

Exclusion Criteria

- Induced preterm labour in any cases like eclampsia, APH.
- Preterm labour with Intrauterine foetal death
- Multiple births (twins, triplets)
- Gestational age of <32 weeks
- Unable to answer the question.
- Exclude those affected with other chronic diseases.

Data analysis:

The study coordinators performed random checks to verify data collection processes. Completed data forms were reviewed, edited, and processed for computer data entry. Frequencies, percentages, and cross-tabulations were used for descriptive analysis. $\chi 2$ test was used to analyze statistical significance. The data analysis was performed using Statistical Package for the Social Sciences (SPSS) Version 25.0. The significance level of 0.05 was considered for all tests.

RESULT

Among the study population (N=100), most of the mother's (61,61.0%) ages ranged from twenty-one to thirty & mean age of the mothers was 23.6±4.4. Most of the mothers (39,39.0%) were from the gestational age of 34 weeks. The mean gestational age was found to be 33.9 ± 1.0 weeks with a range from 32 to 36 weeks. For thirty-eight mothers

(38,38.0%), this was their first childbirth, while the remaining sixty-two mothers (62,62%) were multipara. The regular antenatal check-up was observed in fifty-six mothers (56,56.0%) & three mothers (3,3%) did not receive any form of check-up. Fifty-one mothers (51,51%) had a normal vaginal delivery & forty-nine mothers (49,49.0%) underwent caesarean section **[Table 1].** Infection was the most prevalent maternal complication, present in fifty-three mothers (53,53.0%). Urinary tract infection (UTI) (30,30.0%) had the second highest prevalence, and twenty-one mothers (21,21.0% had bacterial vaginosis, seventeen mothers (17,17.0%) had pre-eclampsia. Multiple pregnancies, diabetes, and hypertension were also among the other complications **[Table 2].** Majority of the newborns (99,99.0%) needed resuscitation, and one neonate (1,1.0%) did not need any resuscitation **[Table 3].** Among the ninety-nine neonates born alive at the present study, thirty-five neonates (35,35.0%) had respiratory distress syndrome, thirty-three neonates had (33.33.0%) sepsis, ten neonates (10,10.0% had meconium aspiration syndrome, five neonates (5,5.0%) had jaundice and three neonates (3,3.0%) had birth asphyxia, thirteen neonates (13,13%) had no complications **[Table 4]. Figure 1** described that majority of the neonates (61,61.0%) had an early death, thirty-eight neonates (38,38.0%) took home alive and stillbirth occurred in one neonate (1,1.0%). Among the neonatal death (n=61), almost half of the neonates (30,49.2%) died of septicemia,

nineteen neonates (19,31.1%) died of respiratory distress syndrome, three neonates (3,4.9%) died of DIC and two neonates (2,3.3%) died of birth asphyxia **[Table 5].**

Table 1: Distribution of the study population based on Characteristics (N=100)

Characteristics	(N,%)
Age **Mean age:** 23.6 ± 4.4	
≤20	33,33.0%
21-30	61,61.0%
>30	6,6.0%
Gestational Age **Mean gestational age:** 33.9 ± 1.0	
32	12, 12.0%
33	20, 20.0%
34	39, 39.0%
35	26, 26.0%
36	3, 3.0%
Parity	
Primiparas	38,38.0%
Multipara	62, 62.0%
Antenatal Check Up	
Regular	56,56.0%
Irregular	41,41.0%
Not received	3,3.0%
Mode of Delivery	
Normal Vaginal Delivery	51,51.0%
Caesarean Section	49,49.0%

Table 2: Distribution of the study population based on maternal complication (n=100)

Maternal Complications	(N, %)
Infection	53,53.0%
UTI	30,30.0%
Bacterial Vaginosis	21,21.0%
Diabetes Mellitus	8,8.0%
Pre-Eclampsia	17,17.0%
Multiple Pregnancy	9,9.0%
Gestational Hypertension	9, 9.0%
Heart Disease	3, 3.0%
Congenital Malformation of Uterus	2,2.0%
Thyroid Disease	1,1.0%
Smoking Habit	8,8.0%

Table 3: Distribution of the neonates based on resuscitation needed (n=100)

Resuscitation need	(N,%)
Admission	99,99.0%
Not resuscitation needed	1,1.0%

Table 4: Distribution of neonates by perinatal complication (n=99)

Perinatal Complication	(N, %)
Respiratory Distress Syndrome	35, 35.35%
Sepsis	33, 33.33%
Meconium Aspiration Syndrome	10, 10.10%

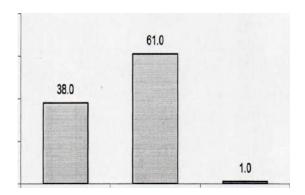|	
Jaundice	5, 5.05%
Birth Asphyxia	3, 3.03%
No Complication	13, 13.13%

Figure 1: Figure showing the neonatal outcome

Table 5: Distribution of the study neonate by cause of early neonatal death (n=61)

Cause of early neonatal death	(N,%)
Septicemia	30,49.2%
Respiratory distress syndrome	19,31.1%
Meconium aspiration	7, 11.5%
DIC	3, 4.9%
Birth asphyxia	2, 3.3%

DISCUSSION

Pregnancy is a crucial moment for the growth and evolution of fetal. Adverse pregnancy results in preterm birth, ectopic pregnancy, spontaneous abortion, low birth weight infants, and intrauterine growth retardation [13]. Premature birth was the leading cause of death in the 1st month of life and it

also was a factor in greater than 75% of early deaths in the neonatal period [14]. The present study was conducted to observe maternal & perinatal risk factors associated with preterm birth. In this current study, it was observed that the majority (61.0%) of patients belonged to the age group of 21-30 years. Another analysis found that the majority of mothers who gave preterm birth ranged from 25-29 years [15].In this study, the mean age was found to be 23.6±4.4 years with an age range of 18 to 35 years This mean age was almost alike to the findings of some other studies [16,17]. Another relevant study carried out in Muscat, Oman showed a median age of 30 years, with the age of the participants ranging from 18-42 years [18]. Around two-thirds of the present study, participants were multipara. Some studies revealed that preterm birth was more certain among multipara [19,20,21]. Current analysis showed that 39.0% of patients were gestational age of 34 weeks. The mean gestational age was found 33.9 ± 1.0 weeks with a range from 32 to 36 weeks. Other relevant studies observed that most of the participants had much earlier gestational weeks, starting from 25 weeks [22,23,24]. This recent study found that around half of the patients (56.0%) acknowledged repeatedly antenatal checks up., 41% were irregular in regards to checks up and the remaining 3% did not receive any form of check-ups. A suitable and precise antenatal check-up is assumed to be an essential factor in preventing preterm birth. Antenatal screening also has a positive influence on detecting some pregnancy complications and this can

trigger the offer of perinatal treatment to improve the outcomes and prognosis for preterm infants [25]. In Bangladesh, 90% of mothers do not get proper antenatal check-ups [26]. The present study found that about half of the patients (51.0%) underwent normal vaginal delivery and 49.0% of mothers experienced caesarean section. Another study revealed that caesarean birth in the other step of term labour is associated with an increased threat of later impulsive preterm birth, whereas cesarian birth in early labour is related to subsequent medically indicated preterm birth, linked with vaginal birth [27]. More than half of the participants (53%) had some form of infection, such as urinary tract infection observed in 30% of the participants, and bacterial vaginosis in 21%. Pre-eclampsia, multiple previous pregnancies, hypertension, and diabetes were among some of the other maternal complications. Smoking habit was identified as a complication in 8% of the participants. An article showed that serious maternal complications associated with haemorrhage (blood loss, blood transfusion, or hysterectomy), infection (endometritis, wound dehiscence, or wound infection requiring antibiotics, reopening or unexpected procedure), intensive care unit admission, or death [28]. This present study found that among neonates, 1 was a stillbirth, 61 had newborn death, and only 38% were alive while they were released from the hospital. Perinatal death was high in our study, compared to the study conducted in Nepal, where perinatal death occurred in 1.46% of the participants

[29]. In this current study, some perinatal complications were observed such as respiratory distress syndrome (35.35%), sepsis (33.33%), meconium aspiration syndrome (10.10%), jaundice (5.05%) and birth asphyxia. Only 13.13% of the neonates had no perinatal complications. Among the 61 neonates who died during a hospital stay, the leading cause of death was septicemia, respiratory distress syndrome, meconium aspiration, disseminated intravascular coagulation and birth asphyxia. The most communal cause of perinatal death was septicemia, followed by respiratory distress syndrome. Another comparable analysis suggested that late preterm neonates were at high risk for feeding difficulty, jaundice, hypoglycemia, temperature instability, apnea and respiratory diseases [30] Newborns are one of the most vulnerable people, especially so when babies are born prematurely. Anticipation and supervision of preterm births are crucial to certify a safe and healthy start to life and a wise asset for human capital growth [31].

CONCLUSION

Preterm birth is one of the major obstetrical complications in mothers. Preterm birth, pre-eclampsia, preterm rupture of membrane, urinary infection, spotting and bleeding are the most essential risk factors for preterm birth. Detecting pregnant women at the threat of preterm deliveries and showing excellent healthcare may lessen preterm birth and its aftermath. The aim of the prevention of the risk of preterm birth

is subordinate to the goal of enhanced perinatal morbidity and mortality.

RECOMMENDATION

Public health efforts in Bangladesh should address the need for improvement of the educational status of the mother. Government should ensure regular antenatal check-ups. There is a necessity for setting a screening docket to cover all age groups for early detection and treatment of cases and to develop an awareness of pregnant mothers who are at high risk for preterm labour. . To get robust data, multicenter studies are in great need of policymakers to interpret the demonstrable scenario and to take necessary steps towards mitigating this problem.

Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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