

Original Article

Gestational Diabetes Mellitus & Diabetes In Pregnancy: Important risk factors of Preterm Premature Rupture of Membrane

UT Nasrin¹, T Sultana², R Kabir³, A Momtaz⁴, H Farzana⁵, B Das⁶

Abstract:

Premature rupture of membrane is the rupture of gestational membranes prior to the onset of labor. When membrane rupture occurs before 37 weeks of gestation, it is referred to as preterm premature rupture of membrane. Gestational diabetes mellitus and diabetes in pregnancy probably increase the risk of premature rupture of membrane or prevalence of premature rupture of membrane and fetal complications during pregnancy. This descriptive cross sectional study was done in Fetomaternal Medicine Unit of Dhaka Medical College Hospital from 01/01/2020 to 31/12/2020 to find out the number of gestational diabetes mellitus and diabetes in pregnancy among all admitted patients of preterm premature rupture of membrane. A total of 103 patients with preterm premature rupture of membrane were admitted. Among them 10 (9.7%) participants were suffering from gestational diabetes mellitus and diabetes in pregnancy, 6 (5.8%) were multiple gestation, 7 (6.7%) were associated with preterm labor, 7 (6.79%) patients had gestational hypertension, 4 (3.88%) were with fetal growth restriction, 3 (2.91%) had fetus with congenital anomaly and 2 (1.94%) patients were with anaemia. Out of 103 participants, total study showed that gestational diabetes mellitus and diabetes in pregnancy are most common risk factors of preterm premature rupture of membrane.

Keywords: Preterm premature rupture of membrane, Gestational diabetes mellitus, Diabetes in pregnancy.

Introduction:

Preterm premature rupture of membranes (PPROM) is defined as spontaneous rupture of membranes at less than 37 weeks of gestation, at least 1 hour before the onset of uterine contractions. It complicates approximately 1-5% of pregnancies and also responsible for about one third (30-40%) of all preterm deliveries.^{1,2}

Although many factors can increase the risk factors of PPRM, still its cause is not fully understood.³ PPRM arises from complex pathophysiological pathways that include inflammation and oxidative stress.⁴ The most known risk factors for PPRM are low BMI <18.5 kg/m², history of PPRM or prematurity, nulliparity,

1. Ummae Tania Nasrin, MBBS, FCPS (Fetomaternal Medicine), FCPS (Obstetrics & Gynaecology), Resident Surgeon, Shaheed Ahsan Ullah Master General Hospital, Tongi, Email:urmi59@gmail.com.
2. Tajmira Sultana, MBBS, FCPS (Fetomaternal Medicine), FCPS (Obstetrics & Gynaecology), Assistant Professor, Fetomaternal Medicine Unit, Dhaka Medical College Hospital, Email:dr.tajmirusultana@gmail.com.
3. Mohammad Rafiqul Kabir, MBBS, D-CARD, Assistant Professor, Sheikh Sayra Khatun Medical College, Gopalganj, Email:rafiqukabir3@gmail.com

4. Azmary Momtaz, MBBS, MPhil, Associate Professor, Pharmacology, Delta Medical College, Dhaka, Email:lizasomc@yahoo.com
5. Hafiza Farzana, MBBS, FCPS (Obstetrics & Gynaecology), Junior Consultant, Fetomaternal Medicine Unit, Dhaka Medical College Hospital, Email:hafizafarzana2007@gmail.com
6. Bappi Das, MBBS, FCPS (Obstetrics & Gynaecology), Medical Officer, Fetomaternal Medicine Unit, Dhaka Medical College Hospital, Email:bappidas26@gmail.com

Address of correspondence:

Ummae Tania Nasrin, MBBS, FCPS (Fetomaternal Medicine), FCPS (Obstetrics & Gynaecology), Resident Surgeon, Shaheed Ahsan Ullah Master General Hospital, Email:urmi59@gmail.com, Phone:+8801866682256.

multiple pregnancies, low level of socio-economic condition and education status, polyhydramnios, cervico-isthmic abnormalities, smoking etc.⁵ The

complications associated with PPRM include prematurity, oligohydramnios, chorioamnionitis (both clinical and histological), abruptio placentae, intrauterine infection.⁶

Diabetes is the most common metabolic complication of pregnancy.⁷ The prevalence of Diabetes is increasing globally due to obesity and sedentary life.⁷ Gestational Diabetes Mellitus (GDM) is defined as any degree of impaired glucose intolerance that first appear or is recognized during pregnancy.⁷ Hyperglycaemia first detected at any time during pregnancy should be classified as either GDM or Diabetes in pregnancy (DIP). According to WHO criteria, GDM should be diagnosed at any time in pregnancy if one or more of the following criteria are met: Fasting plasma glucose: 5.1-6.9 mmol/L (92-125 mg/dl); 1 hour after plasma glucose 11.1 mmol/L (200 mg/dl) following a 75 gram oral glucose load; 2 hours after plasma glucose 8.5-11 mmol/L (153-199 mg/dl) following a 75 gram oral glucose load.

Diabetes mellitus In Pregnancy (DIP) should be diagnosed if one or more of the following criteria are met: Fasting plasma glucose 7.00mmol/L (126 mg/dl); Two hours after plasma glucose 11.1 mmol/L(200 mg/dl); Random plasma glucose 11.1 mmol/L(200 mg/dl) in the presence of diabetes symptoms.⁸

The prevalence of GDM is increasing globally and 3% to 25% of total pregnancies may be affected by it.⁴ The prevalence of GDM in Bangladesh is 9.7% according to WHO criteria and 12.9% according to ADA criteria.⁹ As a large number of PPRM patients are admitted in Fetomaternal Medicine unit and many of them are suffering from GDM and DIP and another study also identified GDM is a new risk factor of PPRM.⁵ so this descriptive cross sectional study was conducted in Fetomaternal Medicine unit, Dhaka Medical College Hospital from 01/01/2020 to 31/12/2020 to identify the presence of GDM and DIP among admitted patients with PPRM. The diagnosis of PPRM was confirmed by well-established clinical and/or biological diagnostic procedures like the visualization of amniotic fluid passing from the cervical canal and pooling in the vagina, a basic pH test of vaginal fluid or ferning of vaginal fluid identified under microscopic evaluation.¹⁰ GDM and DIP were confirmed according to WHO criteria.

The rationale of this study was to observe the number of GDM and DIP among all admitted patients of PPRM as PPRM is an important clinical problems which is

associated with significant maternal and fetal complications specially preterm birth and prematurity. So, by identifying that GDM and DIP as important risk factors of PPRM, proper measures could be taken to detect the GDM early during antenatal visits and also to optimize the blood sugar level of GDM and DIP properly and thus help to reduce prevalence of PPRM and its complications. Objective of this study was to analyse the frequency of patients with GDM and DIP among all admitted PPRM patients in Fetomaternal Medicine unit of Dhaka Medical College Hospital from 01/01/2020 to 31/12/2020.

Materials and Methods:

This descriptive cross sectional study was done in Fetomaternal Medicine unit of DMCH from 1st January 2020 to 31st December, 2020. A total of one hundred and three admitted patients with complaints of PPRM from 24 to 37 weeks of gestation were enrolled in this study. Diagnosis was made on the basis of history, clinical presentations and biological report. Then risk factors of PPRM were analysed. All PPRM patients were treated accordingly as well as proper evaluation were done. After consultation with Endocrinologist, all GDM and DIP patients were managed properly. The purpose and procedure of the study were discussed individually with the patients. After collecting, data was processed and analysed with the help of computer programme SPSS, version 24.

Results:

Out of 103 patients, age distribution shows that 21 (20.39%) patients were between 18-20 years, 69 (66.99%) patients were from 21-30 years and 13 (12.6%) from 31-40 years. The mean age of the patients was 26 years and the youngest and the oldest patients were 18 and 39 years old respectively (Figure 1).

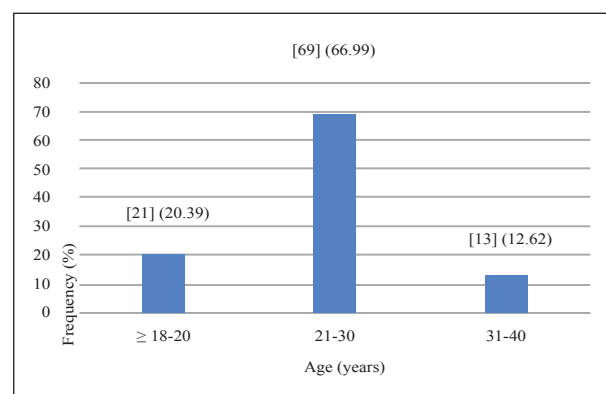


Figure 1: Distribution of participants by age (years).

Nulliparous were 38 (36.8%), primiparous were 36 (35.0%) and multiparous were 29 (28.2%) (Figure 2).

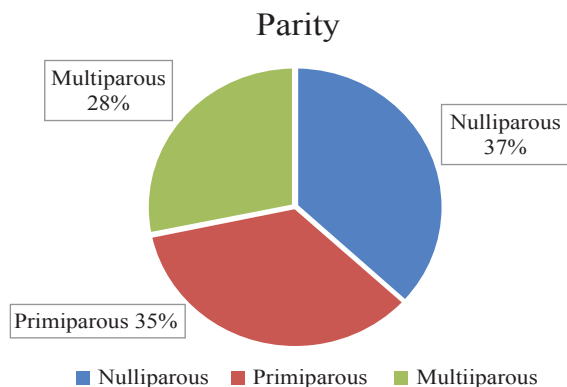


Figure 2: Distribution of participants by parity.

After adjustment of the risk factors of PPRM, the statistics showed 10 (9.7%) were GDM and DIP, 6 (5.8%) were multiple gestation, 7 (6.7%) were associated with preterm labor, 7 (6.79%) were Gestational HTN, 4 (3.88%) were FGR, 3 (2.91%) were congenital anomaly, 2 (1.94%) were with anaemia (Figure 3).

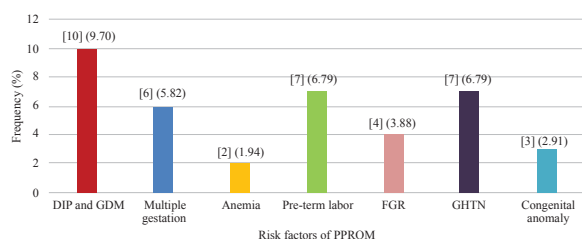


Figure 3: Distribution of participants by risk factors of PPRM

Among all GDM and DIP patients 6 (5.8%) were GDM on diet, 2 (1.9%) were GDM on insulin, 2 (1.9%) were DIP on insulin (Figure 4).

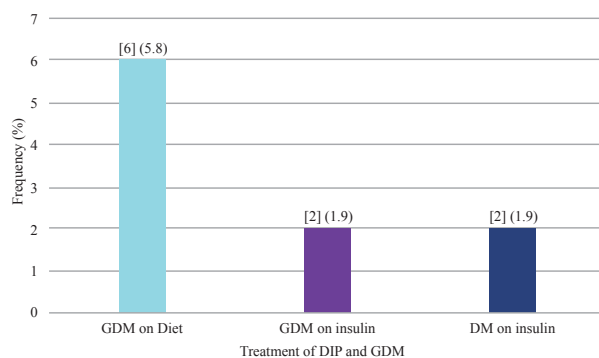


Figure 4: Distribution of participants by treatment of DIP and GDM

Discussion:

As PPRM is an important cause of prematurity and perinatal mortality and morbidity^{1,2}, this study showed common risk factors of PPRM. They were GDM and DIP, multiple gestations, preterm labor, gestational HTN, FGR, congenital anomaly and anaemia. The prevalence of GDM and DIP is increasing in our country¹⁰. Our study also identified that most common risk factors of PPRM were GDM and DIP (9.7%). This findings were in line with a case-control study of 400 subjects that showed that diabetes mellitus, without distinction between pre-pregnancy diabetes and gestational diabetes, were associated with PPRM¹¹ and also with a cohort study of 7,866 pregnant women that identified a new risk factor of PPRM, gestational diabetes, which resulted in a 1.87-fold increased risk⁵. Recent reports indicated that PPRM might be associated with the presence of sterile inflammation of fetal membranes and this inflammation may be responsible for the link between GDM and PPRM.^{12,13}

Conclusion:

This study was performed to identify the risk factors of PPRM and also identified high frequencies of GDM and DIP in PPRM patients, based on a prospective cross sectional study. This study confirmed the most common risk factors of PPRM are GDM and DIP. As PPRM is an important clinical problem of pregnant mother and are associated with increased perinatal and maternal mortality and morbidity, so this study will help significantly to reduce its prevalence by early detection of GDM and DIP and proper treatment. However, further investigations are necessary to understand the pathophysiological link between GDM, DIP and PPRM. As still now there is scarcity of study regarding identification of risk factors of PPRM, more study with large sample size will be needed. Further studies on a large scale are recommended for the well establishment of the fact that GDM and DIP are important new risk factors of PPRM. So that, PPRM and its complications could be reduced significantly and thus maternal and perinatal mortality will also be reduced. Awareness should be developed among obstetricians towards early detection of GDM and DIP as a preventive methods for PPRM from the first trimester of pregnancy.

Conflict of interest: There is no conflict of interest.

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