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ORIGINAL ARTICLE

Frequency of abruptio placentae in preterm premature rupture of membranes.

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ABSTRACT… Objective: To determine frequency of abruptio placentae in preterm premature rupture of membranes. **Study Design:** Analytical Cross-sectional Description. **Setting:** Department of Gynecology and Obstetrics, Khyber Teaching Hospital, Peshawar. **Period:** April 23, 2021 to April 23, 2022. **Methods:** We enrolled 326 patients aged 18 to 35 years, all of whom had singleton pregnancies and presented with preterm premature rupture of membranes (PROM) that occurred less than 48 hours prior to their presentation. These assessments were conducted in both the outpatient and emergency departments to confirm instances of preterm PROM, identified by the pooling or leakage of amniotic fluid in the backside of vaginal vault or from the cervix during examination. Patient follow-up extended from their admission into the Obstetric suite until delivery. Abruptio placentae was diagnosed in cases where a normally positioned placenta separated after 28 weeks of gestation. This diagnosis was supported by ultrasound findings and clinically by symptoms such as painful abdomen during physical examination, whether bleeding per vagina is present or not (between 200 to 400 ml) and the presence of retroplacental clots post-delivery. **Results:** In our research of 326 patients, 35% (approximately 114 patients) were experiencing their first pregnancy (primigravida), while 65% (approximately 212 patients) had been pregnant before (multigravida). The research found that 6% of the total patients (about 20 patients) experienced placental abruption. This indicates an important correlation of preterm premature rupture of membranes and placental abruption. Regarding the gestational period, 124 patients (38%) were under 34 weeks of gestation, whereas 202 patients (62%) were over 34 weeks. The age distribution was also analyzed: 147 patients (45%) were between 18 to 25 years old, and 179 patients (55%) were between 26 to 35 years old. The average age was 31 years with A measure of variability of ± 9.74. After applying the post-stratification chi-square test, we obtained a P value of ≤0.05, indicating statistical importance. **Conclusion:** Preterm premature rupture of membranes is associated with a 6% risk of abruptio placentae.

Key words: Placental Abruption, Preterm, Premature Rupture of Membranes, PROM.

INTRODUCTION

Abruptio placentae (placental abruption) is defined as complete or partial premature separation of a normally sited placenta after 28 weeks of gestation (on the bases of ultrasound). It is a dangerous and potentially deadly complication for both the mother and fetus. Globally, its incidence is about 1% across all pregnancies, while in Pakistan, this figure rises to 7%[1] The perinatal mortality ratio associated with abruptio placentae ranges from 20% to 67%, highlighting the severe risk it poses during pregnancy.[2] Patients presenting with a painful abdomen during a physical examination, with or without vaginal bleeding ranging from 200 to 400ml, were classified as having placental abruption. Those who exhibited retroplacental clots post-delivery were also included. The diagnosis of abruptio placentae is primarily based on physical examination, and should be considered in women exhibiting bleeding per vagina, abdominal pain, a history of trauma, or unexplained preterm birth.

Abruptio placentae can be classified based on the location of bleeding: sub chorionic, retroplacental, or preplacental. Approximately 65-80% of abruptions are “revealed,” while 20-35% are “concealed”.[3,4,5] Concealed abruptions are particularly dangerous due to their severe complications.

Preterm premature rupture of membranes is

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defined as rupture of fetal membranes before 37 completed weeks of gestation and before labor begins, evidenced by amniotic fluid pooling in the backside of vaginal vault or draining from the cervix during examination. This condition manifests in 3% of pregnancies and contributes to 1/3 of all preterm births.[6] The risk of abruptio placentae increases with PROM, particularly when the gestational age at membrane rupture is lower, Alternatively, if the interval period between rupture and delivery exceed 24 hours.[7] Other risk factors include amniotic fluid infection, previous instances of PROM, late pregnancy bleeding, smoking, and maternal underweight.[10] Diagnosis is usually based on physical examination supported by testing the vaginal fluid or ultrasound Women frequently report a painless gush or continuous leakage of fluid from the vagina.[8]

Potential Adverse outcomes for the baby include premature birth, cord compression, and infection, the mother may face risks such as abruptio placentae and postpartum endometritis Treatment depends on the gestational age and presence of adverse outcomes, Near-term individuals without adverse effects typically receive recommendations for labor induction, while those between 24 to 34 weeks without adverse effects may be administered corticosteroids and undergo close monitoring.[11]

Preterm PROM is often linked to ascending intrauterine infections. Hypertensive disorders are also noted risk factors for placental abruption, though findings vary across studies.[9,2] Additionally, chorioamnionitis may either precede or follow an abruption, or both conditions may coexist independently.

METHODS

The research was carried out as an analytical cross-sectional description in the Department of Gynecology and Obstetrics, Khyber Teaching Hospital, Peshawar, from April 23, 2021, to April 23, 2022. It included a total of 326 patients, aged between 18 and 35 years, utilizing non-probability consecutive sampling for participant selection.

The inclusion criteria for the research were patients with single fetus pregnancies, presented with preterm premature rupture of membranes (PROM) lasting less than 48 hours, aged 16 to 35 years. The exclusion criteria encompassed patients with infections such as chorioamnionitis, hypertensive disorders, and those actively taking medications including immunosuppressants, steroids, and antibiotics.

Before commencing, the research obtained authorization from the hospital's ethics committee, via approval letter No107/EC/HMC dated 25 march 2021. Comprehensive histories and clinical examinations, including ultrasound evaluations, were conducted on all participants from both the outpatient department (OPD) and the emergency department. These assessments aimed to confirm cases of preterm PROM, as indicated by the presence of amniotic fluid in the backside of vaginal vault or leaking from the cervix on examination. Follow-up of patients continued from their admission to the obstetric suite until delivery. Abruptio placentae was diagnosed based upon normally situated placenta separating after 28 weeks of pregnancy (on the ultrasound). Also, through symptoms such as painful abdomen Whether bleeding per vagina is present or absent (200-400ml), and the presence of retroplacental clots post-delivery.

All pertinent data such as age, period of gestation, parity, and gravidity were meticulously recorded in a pre-designed proforma. Strict adherence to the exclusion criteria was maintained to limit confounders and biases in the results.

Following that, data interpretation was conducted utilizing SPSS version 22.

RESULTS

In our study of 326 patients, 35% (approximately 114 patients) were experiencing their first pregnancy (primigravida), while 65% (approximately 212 patients) had been pregnant before (multigravida), as detailed in Table-I. The research found that 6% of the total patients (about 20 patients) experienced placental abruption, as shown in Table-II. This indicates an important correlation of preterm premature rupture of

membranes and abruptio placentae.

Regarding the gestational period, 124 patients (38%) were under 34 weeks of gestation, whereas 202 patients (62%) were over 34 weeks, as recorded in Table-III. The age distribution was also analyzed: 147 patients (45%) were between 18 to 25 years old, and 179 patients (55%) were between 26 to 35 years old. The average age was 31 years with a standard deviation of ± 9.74, as shown in Table-IV. After applying the post-stratification chi-square test, we obtained a P value of ≤0.05, indicating statistical importance.

We computed mean and standard deviation for quantitative variables like age and period of gestation. For qualitative variables such as parity, gravid status, and placental abruption, frequencies and percentages were calculated. The study further stratified abruptio placentae according to age, period of gestation, parity, and gravidity to identify potential effect modifiers. The details of this stratification can be found in Tables-V,VI,VII, and VIII, illustrating the effect of these variables on the incidence of placental abruption.

Gravidity	Frequency (%)
Primigravida	114 (35%)
Multigravida	212 (65%)
Total	326 (100%)

Table-I. Gravidity distribution (n=326)

Abruption Placentae	Frequency (%)
Yes	20 (6%)
No	306 (94%)
Total	326 (100%)

Table-II. Abruption placentae (n=326)

POG (Weeks)	Frequency (%)
< 34 weeks	124 (38%)
>34 weeks	202 (62%)
Total	326 (100%)

Table-III. Period of gestation distribution (n=326)

Mean period of gestation was 35 weeks
Standard deviation was ± 3.81

Age (in Group)	Frequency (%)
18-25 years	147 (45%)
26-35 years	179 (55%)
Total	**326 (100%)**

Table-IV. Age distribution (n=326)

average age was 31 years

Standard deviation was ± 9.74

Abruption Placentae	18-25 Years	26-35 Years	Total
Yes	9	11	20
No	138	168	306
Total	147	179	326

Table-V. Stratification of abruption placentae in relation to age distribution (n=326)
P value = 0.9931

Placental Abruption	<34 Weeks	>34 Weeks	Total
Yes	8	12	20
No	116	190	306
Total	124	202	326

Table-VI. Stratification of abruption placentae with respect to gestational age. (n=326)
P value = 0.8519

Abruption Placentae	Primipara	Multi para	Total
Yes	7	13	20
No	110	196	306
Total	117	209	326

Table-VII. Stratification of abruption placentae with respect to parity (n=326)
P value = 0.9317

Placental Abruption	Primigravida	Multigravida	Total
Yes	7	13	20
No	107	199	306
Total	114	212	326

Table-VIII. Stratification of abruption placentae with respect to gravidity (n=326)
P value = 0.9976

DISCUSSION

The study aimed to assess the prevalence of abruptio placentae in patients with preterm premature rupture of membranes (PROM), focusing on those who experienced PROM before 37 weeks of gestation. Its goal was to establish a connection between early membrane rupture and the occurrence of placental abruption, potentially influencing prenatal care and management approaches for high-risk pregnancies. Placental abruption, is a serious complication for both mother and fetus[12,24,25], has a global incidence of 1% in all pregnancies and 7% in Pakistan[13,23], with perinatal mortality rates ranging from 20-67%.[14] Typically, manifests as a combination of symptoms including vaginal

bleeding, abdominal pain, and a tense and tender abdomen. In severe cases, it may cause serious maternal and fetal complications[14], such as disseminated intravascular coagulation (DIC), renal failure, uterine apoplexy, and fetal hypoxia, growth restriction, and neurodevelopmental abnormalities.[13] Among various risk factors for placental abruption, premature rupture of membranes (PROM) is particularly noteworthy.[15,22] PROM refers to the rupture of fetal membranes before the onset of regular uterine contractions[5], with an incidence of 2-3% for preterm PROM and 8% for term PROM.[6,20,21]

Management options of PROM depend on period of gestation and risks of development of complications like chorioamnionitis, placental abruption. Patients with PROM at term are managed conservatively for first 24 hours as most patients have spontaneous onset of labor within first 24 hour. Induction of patient at term decreases risk of development of complications. Patients with preterm PROM are managed conservatively. Conservative management requires both mother and fetal monitoring. Risks of conservative management include chorioamnionitis, placental abruption, fetal distress, fetal restriction and fetal pulmonary hypoplasia. Interventions in the form of induction and delivery of patient should be taken when patient develop complications. Clinician needs to be aware of all the complications of PROM and interventions to maximize the probability of desired outcome.[16]

Extended PROM can lead to intrauterine infections, chorioamnionitis, and placental abruption. Some researches indicate that prolonged preterm PROM is associated with neutrophilic infiltration into the decidua and abruptio placentae. Additionally, sudden uterine decompression following PROM can trigger placental abruption.[7,19]

In a study conducted by Markhus VH et al[17], it was found that "the incidence of abruptio placentae in preterm-PROM (p-PROM) cases was higher compared to the overall study population, with a rate of 11.0 per 1,000 (34 out of 3,077) versus 4.2 per 1,000 (1,495 out of 355,416). The adjusted odds ratio was 2.6, with a 95% confidence interval of 1.8-3.7". Similarly, Suzuki S et al[18] reported in another study that "in singleton pregnancies with preterm premature rupture of membranes (p-PROM), the incidence of abruptio placentae was 4.7%, and the unadjusted odds ratio for abruptio placentae after p-PROM was 6.50 ($p < 0.01$)".

In our research, the mean age of participants was 31 years with a standard deviation of ± 9.74. The mean gestational period was 35 weeks with a standard deviation of ± 3.81. Of the participants, 36% were primiparous and 64% were multiparous, while 35% were primigravida and 65% were multigravida. Among the patients, 6% experienced placental abruption, while 94% did not have.

From above discussion and literature review its concluded that PPROM caries a notable risk of abruptio placentae resulting in several fetal as well as maternal complications also our research results are comparable with other research conducted at different regions of the world. Since no similar research had been conducted in our population within the last five years, this study also furnished us with the most recent and up-to-date data regarding the frequency of abruptio placentae in preterm PROM cases.

CONCLUSION

Preterm premature rupture of membranes is associated with a 6% risk of abruptio placentae.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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AUTHORSHIP AND CONTRIBUTION DECLARATION

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1	Aneela Mumtaz	Conception and design.	
2	Tehsina Ali	Acquisition of data.	
3	Kalsoom Habib Khattak	Analysis of data.	
4	Bushra Khan	Drafting of revising.	