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Original Research Article

Clinical Presentation and Fetomaternal Consequences of Placental Abruption: A Multi-Center Study

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Abstract: *Placental abruption is a major obstetric morbidity described by early detachment of the placenta from the uterine wall. It is dangerous to the mother and fetus in cases of haemorrhage, fetal insufficiency, and perinatal mortality. The crucial issue in upgrading clinical management and minimizing adverse outcomes related to this condition is understanding the fetomaternal outcomes related to the condition.* ***Objective:*** *To evaluate the fetomaternal outcome of patients admitted with a placental abruption in a multi-centre environment.* ***Methods:*** *This was a cross-sectional study; the study was performed at Central Park Teaching Hospital, Lahore, from December 2022 to June 2023. Two hundred patients with ill conditions of placental abruption, and no earlier history of placental pathology development, were accepted. Departmental ultrasonographic scans and structured questionnaires were used in the collection of data. Maternal age, gestational age, kinds of abruption, heart rate of the baby, maternal complications, type of delivery, and neonatal outcome were reviewed utilising the SPSS program, version 25. Assessment of statistical significance was done using chi-square and independent t-tests.* ***Results:*** *The average age of the mothers was 29.4 +/- 5.7 years, and the average gestational age at which the mothers went to hospital was 34.2 +/- 3.1 weeks. Syndesmotic OGD presenting symptom was the most widespread, vaginal bleeding (78%), followed by abdominal pains (64%). Bad maternal conditions involved postpartum hemorrhage (32), hypovolemic shock (18), and emergency cesarean section (41). Fetal outcomes were intrauterine fetal death (22%), low birth weight (38%), and NICU hospitalisations (45%). A statistically strong linkage was identified amid heavy abruption and poor neonatal outcomes ($p < 0.01$).* ***Conclusion:*** *There is a high fetomaternal morbidity associated with pregnancy abruption. Fast identification of obstetric emergencies and urgent obstetric treatment are important to enhance maternal and fetal survival. The burden of this obstetric emergency can be decreased by means of multi-center surveillance and prescribed management protocols.*

Keywords: Placental abruption, fetomaternal, pregnancy complication, maternal morbidity, and perinatal mortality

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Introduction

Placental abruption or premature separation of a normally implanted placenta from the uterine wall before delivery of the newborn remains among the most severe obstetric emergencies. It adds substantially to maternal and perinatal morbidity and mortality rates in the world. The rate is 0.5 to 1.5 percent of all pregnancies in the world. Still, it is significantly higher in the low and middle-income countries because of late diagnosis, no antenatal care, and no good facilities to respond to emergencies (1, 2). Precise placental abruption etiology is multifactorial and not well comprehended. However, the known risk factors are the occurrence of maternal hypertension, trauma, smoking, multiple pregnancy, thrombophilia, and a history of prior abruption (3, 4). The range of clinical presentation of abruption is extremely broad, and it can refer to the following: mild vaginal bleeding and a living fetus, to a huge hidden hemorrhagic syndrome on the part of the mother, and demise of the fetus due to intrauterine fetal death. Placental detachment in pathophysiology implies that uteroplacental blood flow may be significantly impaired, leading to fetal hypoxia, growth limitation, preterm birth, and stillbirth (5, 6).

Maternal complications are just as grave and can include disseminated intravascular coagulation (DIC), postpartum hemorrhage (PPH), and hypovolemic shock, as well as possible maternal fatality in the most extreme cases (7). Considering these risks, placental abruption is a primary cause of perinatal morbidity and an important predictor of obstetric outcomes, particularly in resource-poor settings with traditionally a high number of delays in care.

Although many reports have focused on the independent effects on an individual, maternal, or fetal level on placental abruption, only a few have presented a complete picture of the dual outcomes of the condition, i.e., fetomaternal effects, in a multi-centered reality and a clinically based study (8, 9). It is important to know the entire gamut of outcomes of this complication to design early diagnosis, risk stratification schemes, and interventional pathways to minimize the adverse consequences.

Pakistan is still experiencing major problems with maternal and neonatal health, including a high incidence of perinatal death, which the obstetric complications, such as placental abruption, can partially explain. This burden notwithstanding, there exists minimal local information entailing the cumulative fetomaternal outcomes and related risk factors in the tertiary care centers. Since the provision of care is variable even in separate centers, a multicentric study is of high worth to discover any similar trends and weak points in clinical practice. The research will thus be conducted with an aim of assessing the fetomaternal outcomes of placental abruption across several centers with the use of a standard form of data collection method. The study aims to guide and inform clinical practice, add to national data resources, and assist in evidence-based obstetric care decision-making by determining the rate of occurrence and the nature of maternal and fetal complications caused by other factors related to poor results.

Methodology

A cross-sectional study was conducted in the department of Central Park Teaching Hospital, Lahore in collaboration with Avicenna Hospital Lahore and Lady Willingdon Hospital Lahore, over seven months from December 2022 to June 2023. A sampling of 200 patients who presented with a clinical diagnosis of placental abruption was done using non-probability consecutive sampling. The patients were patients with a first-time diagnosis of placental abruption in the present pregnancy only. As many possible confounding factors and to ensure the sample homogeneity, the women who have a known history of previous placental abruption, placenta previa, or any other type of higher possible abnormality of the placenta in earlier pregnancies were excluded. The informed consent of all the participants was sought before data were gathered, and ethical approval was granted by the institutional review board of the hospital.

The examinations were carried out on a two-tier model that incorporated the results of departmental ultrasonographic scanning at the time of admission as well as completed questionnaires that were conducted by well-trained obstetric personnel. The demography (age, parity, gravidity) details, obstetric history, presenting complaints, clinical signs, fetal heart rate, type and severity of placental abruption, and the corresponding mode of delivery were captured in the study questionnaire. Maternal outcomes were measured as the postpartum hemorrhage, the requirement of blood transfusion, hypovolemic shock, admission to the intensive care unit (ICU), and surgeries. Fetal outcomes were elucidated by intrauterine fetal demise, weight, 1 and 5 minutes Apgar scores, neonatal admission in a NICU, and mortality that occurred in the first 2 days.

Statistical analysis

The Statistical Package for Social Sciences (SPSS) version 25 was used to enter and analyse all data. All variables were evaluated with the help of descriptive statistics. Groups of continuous variables, including maternal age-gestational age, were reported as means and standard deviations, whereas the categorical variables, presence of shock, type of delivery, and neonatal outcomes, were given as frequencies and percentages. The association between the severity of placental abruption and fetomaternal outcomes was tested with the help of inferential statistics. The categorical variable was analyzed with the use of the chi-square test, and the continuous variable with an independent t-test. The results that reflected a p-value less than 0.05 were observed as statistically significant.

Results

The study involved 200 cases of placental abruption. The average maternal age was 29.4 5.7 years, and the average gestational age at presentation was 34.2 3.1 weeks. Among the patients, 119 (59.5%) were multigravida, whereas 81 (40.5%) were primigravida. Most of the cases (62.5%) occurred past 32 weeks of gestation.

Table 1: Baseline Demographic and Clinical Characteristics (n = 200)

Variable	Mean ± SD / n (%)
Maternal age (years)	29.4 ± 5.7
Gestational age (weeks)	34.2 ± 3.1
Gravidity	
- Primigravida	81 (40.5%)
- Multigravida	119 (59.5%)
Presenting symptoms	
- Vaginal bleeding	156 (78%)
- Abdominal pain	128 (64%)
- Uterine tenderness	78 (39%)
Severity of abruption	
- Mild	29 (14.5%)
- Moderate	122 (61%)
- Severe	49 (24.5%)

Abdominal pain (64%), vaginal bleeding (78%), and uterine tenderness (39%) were the most common presenting symptoms. In accordance with ultrasonography, 122 cases (61%) were moderate and 49 cases (24.5%) severe; the rest were mild or concealed.

Mother outcomes were 64 cases (32%) postpartum hemorrhage, 36 (18%) hypovolemic shock, 22 (11%) admission to ICU, and 82 cases (41%) the necessity of emergency cesarean section. Fifty-eight patients (29%) needed blood transfusions. Such fetal complications were the intrauterine fetal demise (IUFD) of 44 (22 %), low birth weight (<2500g) of 76 (38 %), Apgar score <7 in 58 (29 %) at 5 minutes, and 90 neonates (45 %) were admitted to the NICU.

Table 2: Maternal Outcomes by Severity of Abruption

Maternal Outcome	Mild (n=29)	Moderate (n=122)	Severe (n=49)	p-value
Postpartum hemorrhage	4 (13.8%)	38 (31.1%)	22 (44.9%)	0.021*
Hypovolemic shock	1 (3.4%)	18 (14.8%)	17 (34.7%)	0.009*
Emergency C-section	6 (20.7%)	44 (36.1%)	32 (65.3%)	0.014*
ICU Admission	0 (0%)	10 (8.2%)	12 (24.5%)	0.003*

*Statistically significant ($p < 0.05$)

Chi-square analysis revealed that the severity of placenta abruption was significantly related to poor fetal outcomes, including IUFD ($p = 0.001$), low Apgar ($p = 0.004$), and neonatal intensive care unit (NICU) admission ($p = 0.002$). Other effects, such as maternal complications like hemorrhagic shock ($p = 0.009$) and emergency cesarean section ($p = 0.014$), were also significantly common in moderate and severe cases.

Table 3: Neonatal Outcomes by Severity of Abruption

Neonatal Outcome	Mild (n=29)	Moderate (n=122)	Severe (n=49)	p-value
IUFD	0 (0%)	20 (16.4%)	24 (49%)	0.001*
Low birth weight	4 (13.8%)	38 (31.1%)	34 (69.4%)	0.002*
Apgar <7 at 5 min	2 (6.9%)	32 (26.2%)	24 (49.0%)	0.004*
NICU Admission	5 (17.2%)	44 (36.1%)	41 (83.7%)	0.002*

*Statistically significant ($p < 0.05$)

Discussion

The present basis was a multi-center evaluation of the fetomaternal effects of placental abruption in 200 patients who approached the Central Park Teaching Hospital. The results support the existing literature that there are severe effects of placental abruption on the mother and the fetus in both the high-resource and the low-resource populations. Our study findings of mean maternal age and gestation age at presentation were similar to those reported previously by Tikkanen et al. and Ananth et al., with the majority of the cases in the third trimester and women in the late twenties or early thirties (10, 11). The frequent occurrence of vaginal bleeding and abdominal pain during presentation is consistent with the typical clinical pattern ascribed in textbooks of obstetrics and confirmed by other works like those done by Oyelese et al. and Abdella et al. (12, 13).

In our study, we found out that about 41% of the patients experienced emergency cesarean section, and postpartum hemorrhage was observed in 32%, which are maternal risks documented widely in placental abruption. The results are consistent with the data of Hladunewich et al., who prioritized the hemodynamic instability that occurs during acute placental separation (14, 15). Also, the percentage of patients who experienced hypovolemic shock and admission to the ICU was much more prominent in patients with severe abruption, proving once more that the latter patients must be stabilized and undergo surgery as quickly as possible.

From a fetal perspective, intrauterine fetal death was found in 22 percent of the group, and 45 percent were admitted to the NICU. Finding matches the events reported by Sheiner et al. and Tikkanen et al., who contributed to the fetal distress risk increase, preterm birth, and infant fatalities because placental perfusion has been disrupted by the placental abruption (16, 17). The association between the acuteness of abruption and low Apgar scores, NICU admission, and IUFD is statistically significant, which further demonstrates the great necessity of early detection and intensive fetal monitoring of such patients.

The apparent consequences of chronic placental insufficiency and acute insult are the proportion of low birth weight (38 percent in neonates) and Apgar scores below 7 (almost one-third of cases). According to Nair et al. and Kramer et al., chronic and acute placental pathologies lead to poor health outcomes of babies (18, 19).

Although the study was carried out within a resource-restricted environment, it confirmed that a timely obstetric intervention, such as cesarean section and blood transfusion, resulted in a better outcome in moderate conditions. Nevertheless, the significant rates of complications during severe cases of abruption accentuate the necessity of enhanced prenatal surveillance and the "major incident plans" of the emergency protocols in maternity facilities. These results underwrite the WHO recommendations involving skilled birth attendance and accessibility to essential obstetric services to lessen the dangers of placental abruption (20). One of the limitations of our study is that it was hospital-based, which cannot be viewed as the real burden in the countryside or peripheral centers. In addition, the long-term neonatal outcomes were not evaluated. A prospective study with participation in neonatal follow-up information would give a better insight into outcomes.

Conclusion

Placental abruption is an obstetric emergency of high risk and big implications to the health of the mother and the baby. In this study, the researchers discovered that the extent of placental separation is associated directly with poor clinical outcomes that include postpartum hemorrhage, hypovolemic shock, cesarean delivery, intrauterine fetal death, low birth weight, and NICU admission. The statistics indicate how vital it is to have an early diagnosis, prompt intervention, and a multidisciplinary approach to limit morbidity and mortality. In the setting of placental abruption, fetomaternal outcomes might be dramatically enhanced to standardize clinical procedures and to advance referral systems in Pakistan. High-risk pregnant women need closer antenatal care and observation to minimize the burden of this possibly life-threatening condition.

Declarations

Data Availability statement
All data generated or analysed during the study are included in the manuscript.
Ethics approval and consent to participate
Approved by the department concerned. (IRBEC-24)
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Conflict of interest

The authors declared the absence of a conflict of interest.

Author Contribution

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All authors reviewed the results and approved the final version of the manuscript. They are also accountable for the integrity of the study.

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