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Abruptio placenta: A Retrospective Study on Aetiological Factors and Maternal Outcomes

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Abstract
Background: *Abruptio placenta denotes separation of a normally implanted placenta after 20 weeks of gestation. This is a uniquely dangerous condition to both the mother and the foetus because of its potentially serious pathologic sequelae. The maternal complications include haemorrhagic shock, coagulopathy renal failure and even death. The fetal morbidity and mortality are due to prematurity and hypoxia. This study examines the risk factors and maternal complications of the abruptio placenta.*
Methods: *This is a retrospective study of Abruptio Placenta cases carried at tertiary care centrein Kerala. In our study we examined 99 women whose delivery was complicated by abruption of placenta. We also included 99 mothers at term as control who came in labour without abruptio placenta. A detailed obstetrics history was obtained and maternal high risk factors were noted.*
Results: *Incidence of Abruptio placenta is 0.32%. It is most common in the women of age group 21-24 years. Low income group had the highest incidence of abruptio placenta. 39.39 % of cases were associated with severe pre-eclampsia. Previous obstetric history was found to have a bearing on the incidence of abruption. Increased incidence of abruption was found in women with a history of first trimester abortion by instrumental evacuation. Regarding the grade of abruption, maximum cases were belonged to Page's grade 3, and the least number of cases was seen in grade 3.*
Conclusions: *Abruptio placenta is related with poor maternal outcome. Hence early diagnosis and prompt resuscitative measures would prevent maternal mortality and morbidity.*
Keywords: *Abruptio Placenta, Maternal Outcome, Page's Grading, Risk Factors.*

Introduction

The term abruptio placenta denotes separation of a normally implanted placenta prior to the birth of the fetus. The occurrence of abruptio placenta in singleton births is about 0.38–1 % and the occurrence rises among twin pregnancies, ranging from 1 to 2 %.[1] Across the world abruptio placenta is one of the major obstetric complications which may lead to foetal and maternal morbidity and mortality.[2] Abruptio placenta is a major cause of maternal morbidity and perinatal mortality globally and especially in the developing world.[3] Clinical exhibition of vaginal bleeding, abdominal pain, uterine tenderness and identification of retro-

placental clots at delivery helps in the diagnosis of abruptio placentae.[4] Diagnosis of abruptio placentae is most commonly made in the third trimester, but the term may be used after the 20th week of pregnancy when the clinical and pathological criteria are met.

20 to 25 % of antepartum haemorrhages in the third semester is mainly caused due to abruptio placenta.[5] This may lead to various maternal complications like atonic postpartum haemorrhage, renal failure, disseminated intravascular coagulation and even maternal death.[6] Furthermore, abruptio placentae is also linked with antagonistic foetal outcomes including low birth weight, preterm birth, intrauterine growth restriction, birth asphyxia, fetal distress, low Apgar score, transfer to neonatal intensive care unit, stillbirth, congenital anomalies and perinatal death ranging from 4.4 to 67.3 %.[7]

Various researches on maternal and neonatal complications due to abruptio placenta have been carried out in developed countries. But only limited studies are conducted in developing nations to explore the abruptio placenta complications in pregnant women. Given the background, the risk of abruptio placentae and maternal complications in pregnant women in India should be studied extensively. Therefore this present study was conducted to determine the frequency, risk factors for abruptio placentae and maternal outcomes associated with abruptio placentae.

Materials and Methods

This was a case control study conducted at tertiary care centre in Kerala. The study protocol was approved by the Regional Committee for Medical Research Ethics. The period of study was two years.

Ninety nine patients admitted with clinical presentation of abruptio placenta were included in this study. The diagnosis was based on evidence of retro-placental clot accompanied by clinical features such as vaginal bleeding, pain abdomen or uterine tenderness. We have also included a control group with ninety nine term pregnant women irrespective of whether they were delivered by caesarean or vaginal route. All the participants were informed about this research and written consents were obtained from each participant.

Important anthropometric details and risk factors of patients were recorded using a standard questionnaire. Maternal characteristics such as age, socio economic status, blood group, gravidity and the gestational period at which abruption occurred were collected from both control and treatment groups. Details of risk factors associated with abruptio placentae, other medical or gynaecological disorders, grade of abruption, hypertension and its severity and clinical features were noted. To avoid inter observer and instrumental bias; all measurements were taken by the same measuring instrument/scale and by same person. The data were entered into master sheets and necessary statistical tables were constructed. Statistical constants like mean, standard deviation and percentages were computed using appropriate formulae.

Results and Discussions

The results of case-control study of abruptio placenta are depicted in the following tables. In our study, 99 cases of abruptio placentae were reported among 30661 deliveries, during the study period of two years. The incidence was 0.32%. The incidence of abruptio placentae in our hospital appears to be decreasing. The reported frequency for placental abruption averages about 1 in 200 deliveries. In 1986, Karegard and Gennser surveyed 849, 619 births in Sweden and reported the incidence of 1 in 225 cases of abruptio placentae.[8]Ananth et al. reviewed 13 studies with 1.6 million pregnancies and reported an incidence of 1 in 55.[9] This may be due to the following reasons: (1) reduction in the number of high parity women cases, (2) community wide availability of prenatal care and (3) improved emergency transport facilities.[10]

In our study majority of patients were having an average income less than Rupees 10000 per month. Saftlaset.al and Naeye et.al showed an increased incidence of abruption among the socially deprived class.[11,12]

Average age of study group was 26 years and for control group the average age was 24 (table 1). The standard deviation was 4.1 and 4.5 for group I and group II respectively. Maximum numbers of women belonged to the age group of 20 to 24 years and minimum number was found in the age group above 35 years old in group I and group II. We found significant difference ($p<0.05$) in the maternal age of two groups. According the study of Rasmussen et. Al, the incidence of abruptio placenta increases with age of pregnant woman.[13]

Table 1. Distribution according to maternal age

Age group	Study Group		Control Group	
	Frequency	%	Frequency	%
<20	4	4.04	9	9.09
20-24	41	41.41	61	61.61
25-29	33	33.33	23	23.23
30-34	16	16.16	5	5.05
35 and above	5	5.05	1	1.01

Table 2 depicts the gestation age of study group and control group. In control group 100 % patients had gestational age of 35 and above weeks.

Table 2. Distribution according to gestational age

Gestational age in weeks	Study Group		Control Group	
	Frequency	%	Frequency	%
28 and less	7	7.07	0	0
29-32	25	25.25	0	0
33-36	32	32.32	0	0
37 and more	35	35.35	99	100

The mean gestational age was 34.4 weeks for study group, whereas the mean gestational age of the control group was 38.7 weeks. The standard deviation was 3.7 weeks and 1.8 weeks for group I and group II. The p value was <0.01 which shows significant difference between the gestation age of both groups.

Distribution of pregnant women according to gravidity is presented in table 3. There were only 47 primi gravidas in the study group compared to 62 in the control group. There was no significant difference (p value >0.05) in the gravidity between two study group and control group. In our study, there were 9 fourth gravidas, and 1 sixth gravida, compared to none in the control group. Previous studies confirmed that incidence of abruptio placenta is less than 1% among primi gravidas and 2.5% among grand multiparas.[14,15]

Table 3 Distribution according to gravidity

Gravidity	Study Group		Control Group	
	Frequency	%	Frequency	%
PRIMI	47	47.47	62	62.62
G2	26	26.26	21	21.21
G3 and above	26	26.26	16	16.16

Table 4 shows the grades of abruption in study group. This grading is according to PAGE'S classification. Maximum no: of cases were noted in grade 2 (44.44%) with fetal distress or death. The least number of cases belonged to grade 3 (6.06%).

Table 4. Distribution according to PAGE'S grade of abruption

Grade	Frequency	%
Grade 0	11	11.11
Grade 1	38	38.38
Grade 2	44	44.44
Grade 3	6	6.06

Table 5 depicts the risk factors associated with abruptio placentae in study group. Preeclampsia maintains its status as the commonest associate of abruptio placentae and 39.39% women in the study group had it. Ananth et al (1999) reported a threefold increased incidence with chronic hypertension and fourfold with preeclampsia.[16] One case of fibroid uterus with endometriosis (1.01%) was reported in our series. One case of preterm prematurely ruptured membranes, (1.01%) and two cases of premature rupture of membranes (2.02%) were also reported in our study. Previous researches reported a threefold increased risk in preterm prematurely ruptured membranes compared with normal pregnancy.[17,18]

Table 5 Risk factors associated with abruptio placentae

Condition	Frequency	%
Preeclampsia	39	39.39
Essential hypertension	1	1.01
Eclampsia	5	5.05
Uterine leiomyoma with endometriosis	1	1.01
Hydramnios	2	2.02
Trauma	1	1.01
PROM	2	2.02
Preterm premature rupture of membranes	1	1.01
Passive smoking	24	24.24
Previous history of (two) abruptions	1	1.01
History of aspirin intake in present pregnancy	1	1.01
Idiopathic thrombocytopenia purpura	1	1.01
SLE, antiphospholipid antibody syndrome, CNS vasculitis	1	1.01

Two cases of (2.02%) hydramnios were reported in our study. One patient developed grade I abruption after a scooter accident (1.01%).

There was one case (1.01%) of recurrent abruption. This was the patient's third consecutive abruption, with fetal loss. One (1.01%) case of thrombophilic SLE with antiphospholipid antibody syndrome and central nervous system vasculitis was reported in our study. One preeclamptic patient on low dose aspirin developed abruption (1.01%).

Table 6 portrays the list of patients with other medical or gynaecological disorders who developed abruption. Rheumatic heart disease, gestational diabetes mellitus, polycystic ovarian disease, haemolytic anaemia with immune thrombocytopaenia, HBsAg positive cases and 3° utero vaginal prolapse were the other medical or gynaecological disorders considered in our study. We found 4.04% of rheumatic heart disease, 1.01% of idiopathic thrombocytopenic purpura and 4.04 % of gestational diabetes mellitus. Two cases (2.02%) were HBsAg positive.

Table 6 Patients with other medical or gynaecological disorders who developed abruption

Medical / gynaecological disorder	Frequency	%
Rheumatic heart disease	4	4.04
Gestational diabetes mellitus	4	4.04
Polycystic ovarian disease	1	1.01
Haemolytic anaemia with immune thrombocytopenia	1	1.01
HBS Ag positive cases	2	2.02
3° utero vaginal prolapse	1	1.01

Table 7 presents the maternal complications in patients with abruptio placentae. 6 patients in the study group developed coagulation failure and 5 of them had preeclampsia. One patient developed concomitant coagulation failure and renal failure. She was a primi gravida at 35weeks of pregnancy who was admitted as a case of abruption and preeclampsia. ARM was done and she was put on oxytocin acceleration. She developed hematuria, petechiae and profound thrombocytopenia. The clotting time, APTT and prothrombin time were prolonged in her case. She was supported with 3units of fresh frozen plasma, 2units of blood, 2 units of platelet concentrate. She delivered a live baby after 14hours of onset of abruption and developed acute renal failure in the postpartum period. After 3 hours of delivery, cerebral haemorrhage and cardiac arrest occurred and she was put on the ventilator. She died after 6 hours.

Another patient developed coagulopathy, renal failure and HELLP syndrome. She was a primigravida, the fetus was dead in utero and delivered vaginally within 5 hours. Fibrin degradation product was elevated, APTT prolonged, and there was profound thrombocytopenia. She needed continuous veno venous hemodialysis (CVVHD). She recovered from the coagulopathy and renal failure after adequate support with blood, platelet concentrate and fresh frozen plasma and the hemodialysis.

Three other cases that developed coagulopathy had HELLP syndrome with elevated liver enzyme, thrombocytopenia, prolonged clotting time, APTT and prothrombin time. They recovered soon after delivery, and prompt transfusion of blood, fresh frozen plasma and platelet concentrate.

5 of the 6 patients who developed coagulation failure did not develop postpartum haemorrhage, probably because of active management of the third stage with the aid of oxytocin and adequate management of the coagulation failure. One patient, a third gravida, who developed grade 3 abruption with coagulopathy, delivered within 35 minutes of admission, developed severe postpartum haemorrhage and went in for profound haemorrhagic shock. She was resuscitated with 3units of blood and 3units of fresh frozen plasma.

Table 7. Maternal complications

Complications	Frequency	%
Oliguria	2	2.02
Maternal shock	2	2.02
Coagulopathy	6	6.06
Post partumhaemorrhage	5	5.05
Renal failure	2	2.02
Maternal death	1	1.01

Table 8 depicts the method of delivery in patients with abruption. 34.34 % cases needed oxytocin augmentation after ARM to attain a vaginal delivery. In 56.56 % cases the abdominal route of delivery was resorted. Among those who underwent caesarean, 5 cases had a caesarean section in the previous pregnancy. Although vaginal delivery is preferred, operative delivery is often necessary due to maternal or fetal decompensation. Even though operative delivery may be a solution to the problem due to placenta abruption, it may pose significant risks to the patient. If the consumptive coagulopathy is not corrected, the operation may lead to uncontrollable bleeding and an increased need for hysterectomy.

Table 8. Methods of delivery

Methods of delivery	Frequency	%
Spontaneous delivery	3	3.03
ARM, Vaginal delivery	6	6.06
ARM, Oxytocin, Vaginal delivery	34	34.34
Caesarean Section	56	56.56

Table 9 depicts the **r**elationship of history of first trimester abortion by instrumental evacuation and placental abruption. 14.14% in the study group were with a positive history of first trimester abortion by instrumental evacuation, compared to 6.06% in the control group. As the p value is <05, the difference was statistically significant. This difference may be due to the damage caused to endometrium.

Table 9 Relationship of history of first trimester abortion by instrumental evacuation and placental abruption

Abortion	Study group		Control group	
	Frequency	%	Frequency	%
Positive history of 1 trimester abortion	14	14.14	6	6.06
No history of abortion	85	85.85	93	93.93

Maintenance of maternal volumes status and replacement of blood products is essential in managing women with severe placenta abruption and fetal demise.

Conclusions

Placental abruption is a dreaded obstetric emergency owing to its adverse maternal and foetal outcomes. It is potentially life threatening to the mother and her foetus. We studied the frequency, risk factors for abruptio placentae and maternal outcomes associated with abruptio placentae.

Most of the factors identified in our study were found to be consistent with known risk factors in various other studies. We report an incidence of 0.32% of abruptio placenta in our study. This study emphasizes that the incidence of abruptio

placenta is related with risk factors like prematurity, preeclampsia, eclampsia, preterm premature rupture of membranes and passive smoking.

Placental abruption is associated with increased maternal morbidity and mortality. Maternal morbidity due to placental abruption can be reduced with modern management, timely diagnosis and intervention. Importance of antenatal care should be conveyed to the pregnant mother by educating them about the risks and complications of placental abruption. This will help in the reduction of maternal and perinatal morbidity and mortality related with abruptio placentae.

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