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Original Research Article

Abruptio Placenta: Maternal and Fetal Outcome

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Abstract

Placental abruption (abruptio placentae) is an uncommon yet serious complication of pregnancy. The placenta develops in the uterus during pregnancy. It attaches to the wall of the uterus and supplies the baby with nutrients and oxygen. Placental abruption occurs when the placenta partly or completely separates from the inner wall of the uterus before delivery. This can decrease or block the baby's supply of oxygen and nutrients and cause heavy bleeding in the mother. Placental abruptions often happen suddenly. Left untreated, it endangers both the mother and the baby. The aim of this study was to determine the fetal and maternal outcomes of abruptio placenta among pregnant women admitted in a tertiary care hospital in south India for a duration of two years and the secondary objective was to determine the incidence of abruptio placenta, to determine the fetal-maternal outcomes of Abruptio Placenta among patients, and to determine the predictors of perinatal death, maternal death/survival and prolonged hospital stay for patients with abruptio placenta.

Introduction

Placental abruption, defined as the premature separation of the placenta, complicates approximately 1% of births[1]. In normal pregnancies, placental separation occurs immediately after birth, while in pregnancies complicated by abruption, the placenta begins to detach before birth. Placental abruption is due to the rupture of the uterine spiral artery. Bleeding into decidua leads to separation of the placenta. Hematoma formation further separates the placenta from the uterine wall, causing compression of placenta and compromise of blood supply to the fetus.

Placental abruption may be total or partial. This premature detachment commonly produces pain and vaginal bleeding, the clinical hallmarks of placental abruption, and occurs in about 0.6–1.0 percent of pregnancies[2]. Exact etiology of placental abruption remains unknown, but multiple predisposing risk factors have been identified. These include pregnancy induced hypertension (PIH), advanced maternal age and polyhydramnios.

Abruption is potentially disastrous to the fetus as well, with perinatal mortality as high as 60 percent[3] .Abruptio placentae is a major cause of maternal and perinatal morbidity and mortality. In developed countries approximately 10% of all preterm births and 10-20% of all perinatal deaths are caused by abruption[4].

Maternal complications include hemorrhagic shock, disseminated intravascular coagulation, renal failure,

ischemic necrosis of distal organs e.g. hepatic, adrenal and pituitary, uterine apoplexy or Couvelaire uterus leading to postpartum haemorrhage and maternal death. Fetal complications include hypoxia, anaemia, growth restriction, prematurity, neurodevelopmental problems and fetal death. In the developed world, the frequency has been reported from 0.43% to 1.8% with perinatal mortality ranging from 4.4 to 67.3%.

The aim of this study was to determine the fetal and maternal outcomes of abruptio placenta among pregnant women admitted in a tertiary care hospital in south India for a duration of two years and the secondary objective was to determine the incidence of abruptio placenta, to determine the fetal-maternal outcomes of Abruptio Placenta among patients, and to determine the predictors of perinatal death, maternal death/survival and prolonged hospital stay for patients with abruptio placenta.

Method

Study Design: Prospective study conducted on patients presenting with bleeding per vaginum admitted in the department of Obstetrics and Gynaecology in a tertiary care hospital in south India for a period of two years.

Inclusion Criteria:

- All pregnant women with gestational age of 28 weeks and
- above with fundal position of placenta confirmed on Ultrasound.
- Clinical features suggestive of abruption
- Radiological evidence of abruption
- Asymptomatic patients with retroplacental clots following delivery

Exclusion Criteria:

- All pregnant women with vaginal bleeding due to other causes of APH
- Women with less than 28wks gestation were excluded from the study.

Recruitment of Patients

Clinical Workup:

All patients with clinical diagnosis of abruptio placenta over 28 weeks gestation characterized by painful vaginal bleeding accompanied by hypertonic uterine contractions, tender uterus ± nonreassuring fetal heart rate/ fetal distress, fetal demise, pallor and rapid breathing with hypotension (Systolic BP<90mmHg) were recruited in the study. The presence of retro-placental clots post-delivery supported the diagnosis but their absence were not exclusion criteria for the enrollment into the study.

All Patients with Abruption and cases with fetal demise meeting the above-mentioned criteria admitted during the study period were invited into the study. The purpose of the study was explained to participants. Signed consent was taken. Face to face interviews were conducted using the structured questionnaires, including history taking and physical examination.

Apart from physical examinations, bedside obstetric ultrasound was incorporated to a few selected cases to exclude placenta previa and posterior placenta. Each patient's gestation age was calculated using Naegele's rule. Systolic blood pressure was measured in mmHg using manual sphygmomanometer and fetal heart rate counted for whole minute using fetoscope. Parity, clinical presentation of mother were measured and recorded accordingly. All patients were catheterized and 24 hours urine output measured.

Patients were followed up for the mode of delivery, the use of oxytocin and amniotomy. Retro-placental clots were measured in volume based on the kidney dish corresponding to 500mL of blood. Number of blood transfusions, FFP, serum creatinine, care received, and any complications were noted. The Apgar score was determined by Dr. Virginia Apgar score method introduced in 1952; while gender and weight of the baby were measured accordingly. Also, the cases in which resuscitation of the newborn was required were noted.

Mothers and their babies with abruptio placenta were followed up for a period of 7 days post-delivery; and for those who were discharged home early before seven days, were asked to attend OPD on day seven and also the phone numbers were taken for tracing.

Laboratory Work Up

Venipuncture was performed to all participating patients to check for bedside clotting time; platelet count, hemoglobin level, prothrombin time and serum creatinine level. Bedside clotting time was measured by principle/ assistant investigator using 4 ml of blood drawn from patient vein into a dry glass tube and was inverted every 30 seconds, and see when it starts to clots. It should clot in 5 to 11 minutes. If it takes longer than this, she has a clotting defect. If it clots in 5 minutes or less, it is hypercoagulable. Platelets and hemoglobin check-up was determined using 4ml of blood sample kept in EDTA anti-coagulated blood (Purple topped tube); Platelet normal count is 1.5 to 4 lakhs while hemoglobin normal range 11-16 g/dl. Prothrombin time (PT) was evaluated from the tube containing 0.5 mL of sodium citrate then added exactly 4.5mls of blood then sent to the laboratory within 4 hrs for automated analysis and time was recorded in seconds. The normal value is 10-14 sec. Serum creatinine was measured in mg/dl. The normal range is 0.4-0.8 mg/dl.

All the laboratory values, clinical evaluations and management outcomes of the patient were documented in the case record form.

Study Variables

Predictor Variables

1). Maternal

Clinical presentation: Systolic blood pressure, high pulse rate, vaginal bleeding and signs of DIC, volume of retro-placenta clot.

Laboratory results: Bedside clotting time, Serum creatinine, Hemoglobin level, Prothrombin time and Platelet levels.

Management received: Mode of delivery, Number of blood transfusion, Number of Fresh frozen plasma (FFP), ICU admissions, and peripartum hysterectomy.

2). Fetal: Gestation age, birth weight, Apgar score, FHR, Mode of delivery.

Dependent Variables

1.Maternal major outcomes: Prolonged hospital stay and maternal death/survival

2.Fetal major outcome: Perinatal death

Data Collection

Data were collected using a structured questionnaire; and administered through face to face interview. All the necessary information regarding demographic data, clinical findings, laboratory results and outcomes of each patient and their babies were collected during admission and during the course of management by using the data collection form.

Results

A total of 77 cases of Abruptio placenta were recruited during the study period out of 12628 cases admitted for deliveries. Among 77 cases of Abruptio placenta, 11(19%) were booked and 66 (81%) were unbooked. Among the 77 cases of abruption, 71% of the cases were in the age group of 21-30yrs**.** 22% of patients were ≤20yrs and 7% were above 30 yrs. 48% of the cases were between 33-36+6 wks of gestation.35% were above 37wks of gestation and 17%were below 32 wks gestation.

Among 77 cases in this study, Hypertension is seen in 54 (67%) cases, previous history of abruption was noted in 6% of the cases. 2(3%) out of 77cases had history of trauma. PPROM was seen in 5(6%) cases. There was association of abruption with previous LSCS in 6(8%) cases. No specific risk factor was identified in 8(10%) cases [Figure 1].

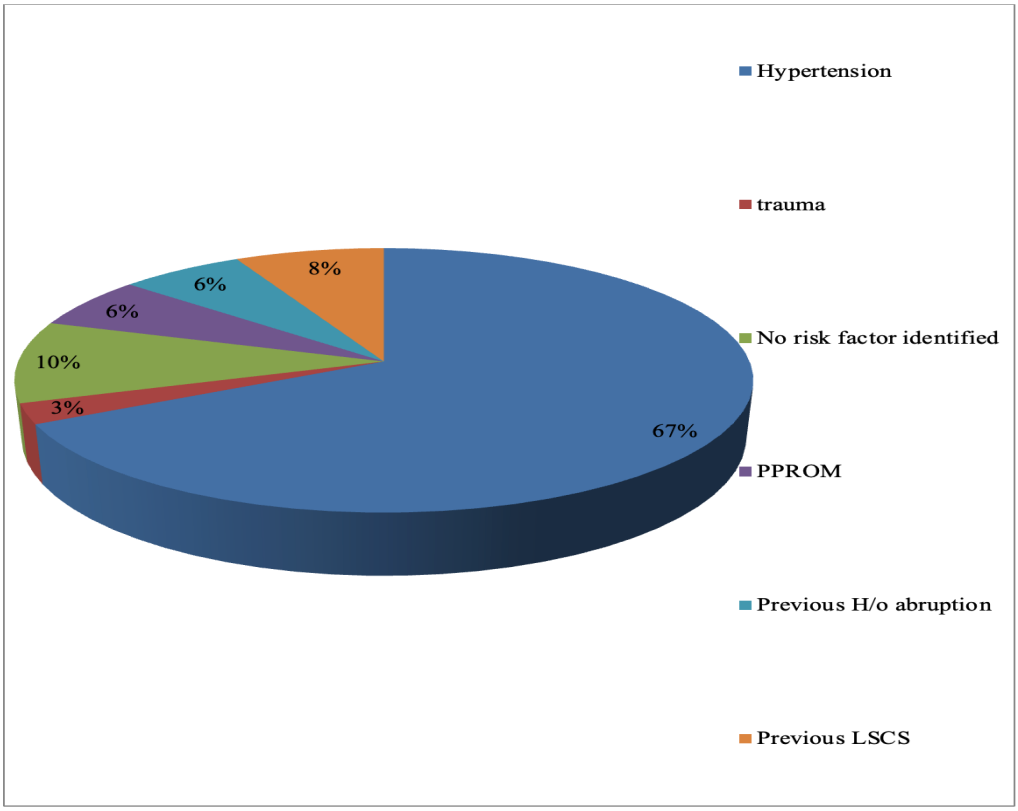

Figure 1: Clinical Presentation of risk factors.

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Table1: Clinical presentation in abruption

Clinical presentation	No of cases	Percentage
Vaginal bleeding & pain abdomen	52	68%
Vaginal bleeding alone	11	14%
Pain abdomen	9	12%
Decreased fetal movements	13	17%
Draining p/v (PPROM)	5	6%

Out of 77 cases in this study, Vaginal bleeding was the most common presentation in 63(81%%) cases. 52(68%%) cases presented with vaginal bleeding and pain abdomen while 11(14%) cases presented with vaginal bleeding alone.9(12%) cases presented with pain abdomen.13(17%) cases presented with decreased fetal movements and 5 (6%) cases presented with draining per vaginum (PPROM

Hb at admission:

among 77 women in this study, 72(93%) women were anemic at the time of admission. 45(59%) women had moderate anemia and 10(13%) had severe anemia.

As shown in the table 2, 37(48%) cases were in PAGE 3. 10(13%) were in PAGE 2, 21(27%) in PAGE1 and 9(12%) in PAGE 0.

Table 2:

PAGE	Number of cases	Percentage
PAGE 0	9	12%
PAGE 1	21	27%
PAGE 2	10	13%
PAGE 3	37	48%

Out of 77 patients in this study, 50 (65%) women delivered vaginally and 27 (35%) underwent Caesarean section. Among these 77 cases of abruption,51(66%) babies were found to be low birth weight i.e less than 2.5 kgs and 26(34%)babies were above 2.5 kgs.

Out of the 16 cases of PPH, 10 were managed by medical methods, and 6 were managed by surgical methods. Couvelaire uterus was noted in 3 cases intraoperatively. Maternal mortality in this study was 4%. Out of the 3 cases of maternal mortality, the cause of death in 2cases was due to DIC. The cause of death in the other case was due to severe hypovolemic shock.

Among the 38 live births, there were 8 early neonatal deaths which occurred due to fetal distress and prematurity. Perinatal mortality in this study was 47(61%). Of these, 34 were confirmed as IUD at the time of admission and 5 were stillbirths. The remaining 8 fetuses were born alive but died in early neonatal period due to respiratory distress.

Discussion

This is a prospective study of 77 cases of abruptio placenta at our institute during the study period. High incidence of cases shows that antenatal care started in early pregnancy would help in early detection of cases of patients who are at risk of development of abruptio placentae, hereby helping in reduction of maternal and foetal morbidity. The incidence of abruptio placenta among pregnant women admitted is 0.6 per 1000 population. The incidence in various studies is shown in the following table 3.

Table 3: Incidence of Abruptio placenta in various studies

S. N.	Author	Year	Incidence
1	Ananth et al	2006	1%
2	Shrivastava et al	2012-2014	1%
3	Subha sivagami et al	2017	0.5%
4	Present Study	2015-2017	0.6%

The incidence of abruption according to Aananth et al 2006 and Shrivastava et al 2014 was 1%.According to Subha sivagami et al study in 2017 the incidence of abruption was 0.5%.The incidence in this study is 0.6% which correlated with the above studies.

According to Nazli Hossain et al 2008[49] study the incidence of abruption is maximum seen in the age group of 21-30 yrs (72%). In Choudary et al 2015[48] study the incidence is 64% and according to Subha sivagami et al study 2017 the incidence is 74%.In the present study the incidence in the age group of 21-30yrs is 71% which correlated

In the present study 81% of the cases were unbooked. This is because most of the study group people were referred from other centres like PHCs and tribal areas. Majority of the women in this study belonged to low socio economic status and were from rural areas. Antenatal booking shows a determined pattern of care received by the mother and willingness to present to health care facilities for safe motherhood and healthy child. This is more significant in

our area as attending antenatal care implies foregoing daily wages and financial loss for a day. The demographic profile in this study coincides with the studies of Choudary et al 2015, Renuka et al 2016[46]. According to Ismail khan et al 2017[47], the incidence of abruption was noted to be more in booked cases(63%) which did not correlate with this study.

As shown in the above bar diagram incidence of abruption is more in multipara compared to primigravidae. According to Renuka et al 2016, the incidence is 83% in multipara. Sivagami et al 2017 stated that incidence of abruption in multiparous women is 78%. In Khan et al study done in 2017 the incidence is 69%. In the present study the incidence in multiparous women is 65%,which correlated with the above study. But in Choudary et al 2015 study the incidence of abruption is more in primigravidae(58%) which did not correlate with this study.

In the present study the incidence of abruption was more in women with gestational age between 32–36*6 wks(48%) compared to women with gestational age of less than 32 wks(29%) and more than 37wks(35%). This study is in correlation with studies of Hossain et al 2008, Bibi et al 2009, and Chowdary et al 2015.But in Khan et al study 2017 the incidence of abruption is more in women with gestational age more than 37wks (54%) compared to gestational age less than 37wks(43%) which did not correlate with this study.

The most common clinical presentation in abruption placenta is bleeding per vaginum. In the present study 81% of the patients presented with bleeding p/v. 68% of the patients presented with bleeding p/v and pain abdomen and 14% presented with bleeding p/v alone.

The present study is in comparison with studies of Hossain et al 2008, Renuka et al 2017 and Khan et al 2017. Among all the risk factors, Hypertension appeared to be the commonest associated factor in 67% mothers in the present study..

Choudary et al 2015 stated that Hypertensive vasculopathy may affect placental vasculature which may succumb to sudden rise in blood pressure thereby leading to abruption. There was association with Hypertension in 53% of the cases in his study.

Sivagami et al 2017 reported an incidence of Hypertension in 75% of the cases. Renuka et al 2017 stated that some type of hypertension was associated in 70.95% of cases. The present study is in correlation with the above mentioned studies.

In the present study 93% of the women were anemic at the time of admission. (Hb <11g/dl).Sarwar et al 2004 reported an incidence of 96% anemia. This high frequency of maternal anaemia is reflective not only of the bleeding of abruptio placenta but is aggravated by an underlying chronic maternal nutritional deficit common in our country.

In Kapadia et al 2017 study most of the patients (89%) were anaemic (<10.9 gm%) at the time of admission. These findings suggest that abruptio placentae cause anaemia and subsequent shock due to blood loss. In Jabeen et al study 1995 86% of the women were anemic at admission.

As shown in the above bar diagram, majority of the patients delivered vaginally. In the present study the rate of vaginal delivery is 65% which is in comparison with the studies of Sarwar et al 2004 and Kapadia et al 2017. In Hossain et al 2008 study the caesarean section rate was comparatively higher i.e 45%. In Tikkanen et al study caesarean section rate was as high as 91%

As shown above, 48% of the cases in this study were in PAGE 3 which correlated with the study of Khan et al 2017(53% in PAGE 3). Out of this 48%, majority of the women had IUD at admission(44%) thereby accounting for 91% of the PAGE 3

group. This abnormally high proportion of IUDs in our hospital is because being a tertiary referral hospital and because of the late referrals from the tribal areas and surrounding PHCs in the rural areas.

The incidence of low birth weight babies is 66% in the present study which correlates with the studies of Sarwar et al 2004, Nath et al 2007, and Khan et al 2017. This high rate of low birth weight babies is due to the preterm deliveries. In the present study perinatal mortality is 61%. According to Renuka et al 2017 abruption is associated with high perinatal mortality. Leading cause for the neonatal deaths is prematurity. Next being birth asphyxia. Hossain et al 2008 study stated that increased perinatal mortality was seen with preterm gestation. The mean birth weight was found to be 2400 gms. In Kapadia et al study 2017 the perinatal mortality rate was 72%. But in Sivagami et al study 2017 the live birth rate was 69.8%.

In Kapadia et al study 2017 study, pregnant women with abruptio placentae were at higher risk for developing complications like PPH (11%), DIC (16%), AKI (6%), Shock (9%) wound gaping (2%) and mortality in 4%. 72% of the cases of abruptio placentae required blood transfusion and 40% FFP transfusion, 8% cases required cryoprecipitate transfusion, 28% cases required PRC transfusion.

In Khan et al study 2017 anaemia appeared as the most common complication (57.66%) followed by hypovolaemic shock (25.18%) and PPH (23.72%). DIC and ARF occurred in 35(12.77%) and 18(6.57%) patients respectively. Postpartum depression was seen in 79 patients (28.83%). Blood transfusion-related complications were seen in 10 patients (5.78%) out of the 173 patients (63.14%) who required transfusion. Maternal mortality was 11.67%

According to Choudary et al 2015 study, among maternal complications PPH was commonest, followed by disseminated intravascular coagulation, puerperal sepsis, shock and renal failure. There was no maternal mortality in this study. .This can be attributed to improved obstetric care, timely interventions and availability of blood and blood components.

In Sivagami et al 2017 study among the maternal complications, Postpartum Hemorrhage was commonest followed by Disseminated Intravascular coagulation (DIC), Acute Renal Failure (ARF), shock, pulmonary edema and infection.

In the present study out of the 16 cases of PPH, 10 were managed by medical methods, and 6 were managed by surgical methods. Couvelaire uterus was noted in 3 cases intraoperatively. Maternal mortality in this study was 4%. Out of the 3 cases of maternal mortality, the cause of death in 2cases was due to DIC. The cause of death in the other case was due to severe hypovolemic shock. In the present study perinatal mortality is 61% out of which 44% were confirmed as IUDs at the time of admission to our hospital. This high rate of IUDs is due to more number of referred cases to our hospital from the surrounding tribal and rural areas and late presentation of the patients to hospital. 7% of the babies were stillborn and 10% early neonatal deaths occurred, most of them due to prematurity and respiratory distress.

In Kapadia et al study 2017, perinatal mortality was 72%. Such a high rate was due to IUD which had more occurred in cases of abruptio placentae leads to poor prognosis as there is late presentation of the patient to the hospital, during which time the disease progress to an advanced stage. According to Khan et al 2017 study, 27.7% showed intrapartum foetal distress at presentation. Only 50% weighed above 2.5kg and among the rest 47.45% were low birth weight and 2.55% were macrosomic at the time of delivery. 151 still births (55.1%) were recorded with majority (30.29%) occurring as intra uterine foetal deaths and 24.81% occurring as intrapartum deaths.

Only 123 live births were recorded (44.89%) with 45 of these babies (36.58%) requiring NICU admission. 16 babies died in the first week of life (5.84%). Total perinatal mortality was 60.94%.

Conclusion

Abruptio placenta is a grave and potentially life-threatening condition for mother and foetus which tests the limits of even the best equipped obstetrical and neonatal units. Educating the pregnant mother about the importance of antenatal care and easy accessibility to quality antenatal services would go a long way in bringing down the maternal and perinatal morbidity and mortality related with abruptio placentae. There are no reliable predictors of the timing in pregnancy at which placental abruption may happen but when patient comes with risk factors like hypertension, special attention should be paid and active management should be started. When abruptio placenta is diagnosed, active team management should be done. Present study indicates that uncorrected anaemia is still common in India contributing to increased maternal mortality and morbidity and also necessitating high requirement of blood transfusion. There is need for directed efforts for correction of anaemia in pregnancy.

Introduction of availability of injectable iron at rural level can lead to a major reduction in anaemia complicating pregnancy. National Anaemia Prevention Programme needs to be modified by incorporating the facility for iron at rural level. In India, it is essential to strengthen the emergency transport facilities from periphery to tertiary care center as correct intervention at the appropriate time in these patients is crucial to bring out a good outcome of pregnancy.

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