

Retrospective study of risk factors and maternal and fetal outcome in patients with abruptio placentae

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Abstract

Introduction: Abruptio placentae (AP) which is a major cause of maternal morbidity and perinatal mortality globally is of serious concern in the developing world. We retrospectively analyzed the AP cases and evaluated its impact on fetal and maternal outcomes. **Materials and Methods:** The present study was undertaken from September 2007-August 2009 at a tertiary care center attached to medical college; patients of AP were selected from all cases with minimum of 28 weeks of gestation, presenting with antepartum hemorrhage. Patients underwent complete obstetrical investigations and were managed according to maternal and fetal condition. **Results:** 4.4% incidence rate of AP was documented accounting for 318 cases during the study period. Most of cases were unbooked, with an average age of 34.5 years (range, 18-44) and nearly two-third of the patients were from lower socioeconomic class. Anemia was observed in 96% of patients, with 3.5 and 68% incidence of maternal and fetal mortality, respectively. **Conclusion:** We observed a higher than expected frequency of AP and neonatal mortality in our study population, which is of major concern. We envisage need for mass information regarding the importance of antenatal maternal care and improvement in nutritional status, which may reduce the frequency of maternal and fetal morbidity and mortality associated with AP.

Key words: Abruptio placentae, antepartum hemorrhage, gestational hypertension, perinatal mortality

INTRODUCTION

Abruptio placentae (AP) is defined as the preterm partial or complete separation of normally implanted placenta from the uterine wall.^[1] AP is a major cause of maternal morbidity and perinatal mortality globally and specially in the developing world.^[1-4] AP complicates one in 100-200 (0.5-1%) pregnancies in western population,^[1,4,5] However, rates as high as 4.5% have been reported in

developing countries.^[2] Although etiology of AP is not fully understood, its generally multifactorial, that is, impaired placentation, placental insufficiency, intrauterine hypoxia, uteroplacental under perfusion, hypertensive disorders of pregnancy, nonvertex presentation, polyhydramnios, intrauterine growth restriction, advanced maternal age, maternal trauma, cigarette smoking, alcohol consumption, cocaine abuse, short umbilical cord, sudden decompression of the uterus, retroplacental fibromyoma, retroplacental bleeding from needle puncture (i.e., post amniocentesis), prior fetal demise, previous miscarriage, grand multiparity, preterm rupture of membranes (PROM), trauma, and/or low prepregnancy body mass index are associated with AP.^[1-8] The signs and symptoms of AP vary depending on the severity of bleeding and degree of separation of the placenta.^[1-3,6] The most common presentations include vaginal bleeding, uterine and abdominal pain and tenderness, abnormal uterine contractions, premature labor,

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maternal hemodynamic instability, fetal distress, and fetal death.^[1-3,6] Additionally previous incidence of AP, family history and measurement of uterine artery flow in early pregnancy may provide useful information. Although several biochemical markers for AP are studied none of these are clinically useful.^[6] We conducted this retrospective study to understand the rate of AP in our study population, its consequence on fetal and maternal outcome and to identify the associated risk factors.

MATERIALS AND METHODS

A retrospective descriptive study from September 2007-August 2009 was carried out in the department of Obstetrics and Gynecology in hospital which is a tertiary level center and teaching institute. Our institutional review board does not require its approval for the review of patient records or images. Patient are informed at the time of admission about the possibility that their medical records will be reviewed for scientific purposes. . The study population included all cases presenting with antepartum hemorrhage during the study period. We defined AP as complete or partial separation of normally located placenta before parturition. AP was diagnosed based on clinical signs and symptoms of vaginal bleeding, tense and tender abdomen, hypertonic uterus, and confirmed at delivery by the local examination of placenta for separation and presence of retroplacental hematoma. If clotting/hematoma was incidentally observed in the absence of any clinical signs, the case was excluded. All women after 28 weeks of gestation with clinical diagnosis of AP were included. The following clinical information were collected: Maternal age, parity, gestational age at delivery, birth weight, and medical complications such as diabetes mellitus, hypertension and thyroid disease, general physical examination, and abdominal and pelvic examination. Relevant investigations such as laboratory tests like hemoglobin (Hb), peripheral smear, platelet count, coagulation profile, kidney function tests, liver function tests, urine examination, and ultrasonography (USG) imaging and cardiotocography were performed especially to assess fetal well-being. Socioeconomic status of the patient was calculated as per modified Kuppuswamy's socioeconomic status scale - updated for 2007.^[8] Patients were managed according to maternal and fetal condition and all maternal and/or fetal complications were documented.

RESULTS

Of the total 7,164 cases admitted for deliveries, we had 837 cases of antepartum hemorrhage of which 318 cases were due to AP during the study period. Hence, a 4.4%

incidence rate of AP was observed. Alarming 264 cases of AP presented were unbooked emergencies, while 54 cases had at least one antenatal check-up in our hospital.

Maternal characteristics are discussed in detail in Table 1. Average age of patients was 34.5 years (range: 18-44 years) and 45% of patients were above 30 years. A total of 25, 11, and 10.4% of cases were associated with hypertension, grandmultipara, and trauma, respectively. Majority (96.2%) of the patients (306 patients) had severe (192 (60.4%); Hb 7.1-10.0 g/dl) to moderate (114 (35.8%); Hb 4.0-7.0 g/dl) anemia and only 12 (3.8%) patients had Hb levels between 10.1 and 13.0 g/dl. Two-third of the patients belonged to lower socioeconomic status.

Vaginal bleeding (90.56% cases) was the most common symptom observed and majority of the patients had hypertonic uterine contraction (54.71%) [Table 2]. Majority (70%) of the cases were delivered vaginally. We had 163

Table 1: Maternal characteristics

Variables	No. of cases (%)
Age group (years)	
<20, 20-25, 26-30, 30-35, 36-45	12 (3.78), 49 (15.4), 114 (35.8), 71 (22.3), 72 (22.58)
Parity status	
Primigravida, G2, G3, G4	60 (18.86), 90 (28.3), 90 (28.3), 68 (24.5)
Pregnancy duration in weeks at presentation	
<30 weeks, 30-36 weeks, >36 weeks	38 (11.9), 124 (39), 156 (49)
Obstetrical risk factors	
Chronic hypertension	6 (1.9)
Gestational hypertension	49 (15.4)
Preeclampsia	14 (4.4)
Eclampsia	3 (0.9)
Past h/o gestational hypertension and presently normal	6 (1.9)
Grandmultipara	35 (11)
Trauma	33 (10.4)
Polyhydramnious	30 (9.4)
Prior cesarean delivery	30 (9.4)
Idiopathic	30 (9.4)
Malpresentation	24 (7.5)
Multiple pregnancy	24 (7.5)
PROM	18 (5.7)
Recurrent abruption	6 (1.9)
Smoker	4 (1.2)
Thyroid disorder	3 (0.9)
Diabetes mellitus	3 (0.9)
Short cord	2 (0.6)
Socioeconomic status (Kuppuswamy's scale-updated for 2007)	
Upper (I)	6
Upper middle (II)	27
Lower middle (III)	71
Upper lower (IV)	112
Lower (V)	102

h/o: History of, PROM: Preterm rupture of membranes

incidences of complications with 32 intensive care unit (ICU) admissions. Nearly 23% of our patients received more than 3 units of blood transfusions. Obstetric hysterectomy was required in seven patients for control of postpartum hemorrhage (PPH). There were 11 (3.5%) maternal deaths in the study of which five were received in severe shock with abruption, three were secondary to multiorgan failure following disseminated intravascular coagulation, two due to uncontrolled PPH, and one following multiorgan failure subsequent to renal failure and sepsis. The fetal mortality (68%) outcome [Table 3] was unexpectedly high compared to most other studies. The birth weights of newborns showed a tendency towards lower weights in more than 50% of the cases.

DISCUSSION

The 4.4% incidence rate of AP observed in our study is much higher than the 0.5-1% incidence rate of AP reported in American, European, and east Asian populations.^[1,4,5,9,10] The higher incidence of AP in our study may be because of the lower socioeconomic strata with concurrent poor nutritional status of the patients attending our tertiary referral public hospital and is consistent with similar studies reported from other developing countries.^[2] Several preclinical and observational studies have associated micronutrients such as zinc and vitamins with pregnancy complications including placental abruption.^[10,11] Levels of vitamin A, b-carotene, and vitamin E in peripheral venous blood of women with AP were reportedly lower than levels observed in women with a normal pregnancy.^[10,12] A low pregnancy weight gain is also reported to be associated with AP.^[10,13] In our study, 96.2% patients had anemia (Hb <10 g%), however it could not be concluded whether anemia was the cause or consequence, of antepartum hemorrhage, as majority of patients were unbooked with no antenatal records. This high frequency of maternal anemia is reflective not only of the bleeding associated with AP, but is also aggravated by an underlying chronic maternal nutritional deficit commonly prevalent in developing countries.

The 25% incidence of hypertensive disorder observed in our study may be an underestimate owing to masking of hypertensive disorder by lower blood pressures due to vaginal bleeding in patients with AP. Nevertheless, patients with gestational hypertensive diseases are prone to develop AP.^[3] Hypertension and diabetes mellitus can cause and enhance the placental insufficiency and eventually lead to AP.^[2] Interestingly, a previous study^[14] reported 23.6, 10, and 2.3% incidence of AP in patients with eclampsia, chronic hypertension, and preeclampsia, respectively. Consistent to this grade 3 AP was significantly higher

Table 2: Maternal outcomes

Variables	No. of cases (%)
Symptoms	
Vaginal bleeding, pain in abdomen, giddiness/shock	288 (90.6), 228 (71.7), 24 (7.5)
Signs	
Hypertonic contraction, tonically contracted uterus, relaxed uterus, absent FHS, fetal distress	174 (54.7), 84 (26.4), 60 (18.9), 84 (26.4), 60 (18.9)
Mode of delivery	
Normal vaginal, forceps, vacuum, cesarean	216 (67.9), 4 (1.3), 2 (0.6), 96 (30.2)
Type of abruption	
Concealed, revealed, mixed	18 (5.7), 240 (75.4), 60 (18.7)
Maternal complications	
Severe shock, DIC, postpartum hemorrhage, renal failure, sepsis, mortality	18 (5.7), 70 (22), 36 (11.3), 24 (7.5), 15 (4.7), 11 (3.5)
Interventions required	
Maternal transfusions:	
1 Unit	21 (6.6)
2 Units	225 (70.8)
≥3 Units	72 (22.6)
Obstetric hysterectomy	7 (2.2)
Modified B lynch	3 (0.9)
Internal iliac artery ligation	4 (1.3)
Uterine artery ligation	5 (1.6)
Transfer to ICU	32 (10.1)

FHS: Fetal heart sound, ICU: Intensive care unit, DIC: Disseminated intravascular coagulation

Table 3: Fetal outcomes

Fetal outcomes	No. of cases (%)
APGAR	
0	216 (67.9)
1-4	6 (1.9)
5-10	96 (30.2)
Baby dead	216 (67.9)
Intrauterine death	180 (56.6)
Fresh still birth	36 (11.3)
Baby alive	102 (32.1)
Birth weights (kg)	
<2.0	180 (56.6)
2.1-3.0	84 (26.4)
3.0-4.0	54 (17)
Gender	
Male	163 (51.3)
Female	155 (48.7)

among hypertensive patients.^[15] Forty-five percent of patients with AP in our study were over 30 years of age. Older maternal age may be associated with an increase in obstetric complications secondary to a higher incidence of underlying medical disease, decreased cardiovascular reserve, and diminished ability to adapt to physical stress that may accompany ageing.^[16] The increased incidence of diabetes and chronic and pregnancy-induced hypertension with aging collaterally increases the incidence of AP.^[16,17] With more women opting for late pregnancies, this risk factor needs considerable medical attention. Poor perinatal outcome characterized by high intrauterine deaths observed

in our study is consistent with other reports from public sector hospitals in developing countries, but is in contrast to east Asian, American, and European studies.^[1,2,10] This could be attributed to adverse fetal-maternal conditions during gestation and the severity of AP. Rate (30%) of cesarean section was high in our study, which was opted in fetal interest as cesarean delivery was associated with significant reduction in neonatal mortality.^[2,18] Maternal and fetal outcome can be optimized through attention to risk and benefits of conservative management versus expeditious delivery in cases of AP. Hence, AP is a major cause of maternal and perinatal morbidity and mortality. AP often happens unexpectedly. The management depends on the extent of abruption, gestational age, and maternal and fetal conditions. However, it is likely that in most AP cases are longstanding process dating back to early pregnancy and hence, a predictive test would be most useful in clinical practice.^[6] Several biochemical markers, uterine artery flow measurement, and risk factor analysis have been tested with limited clinically utility.^[6,19-24] Although most risk factor score analyses are retrospective, a prospective analysis of these risk factors in the management of high risk pregnancies may be clinically beneficial.

To conclude, AP represents a potentially serious obstetric problem that tends to compromise fetal viability, neonatal mortality and morbidity, and maternal health and well-being. Increased frequency of AP is observed in women with low socioeconomic status, no antenatal checkup, and poor nutritional status. Mass information regarding the importance of antenatal care of pregnant women and improvement in nutritional status may reduce the frequency of AP, and thus maternal and fetal morbidity and mortality. Services of the healthcare providers can be taken to identify women at risk, early detection and timely referral of these women for optimal medical management.

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