Abruptio placenta: an obstetrician's nightmare

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Abstract:

Background: Abruptio placenta is as an important cause of antepartum hemorrhage (APH) and accounts for 20 – 25% of all cases of APH. It is defined as premature separation of a normally situated placenta before the delivery of the fetus. Abruptio placenta is a serious obstetric condition that increases maternal and neonatal morbidity and mortality. **Objectives:** This study was undertaken to determine the incidence, etiology, risk factors, clinical presentation and feto-maternal outcome of abruptio placenta. **Method**: This was a prospective observational study done in Bangalore Baptist Hospital from 2017-2020. The primary outcomes were included the occurrence and frequency of various maternal complications and evaluation of fetal and neonatal outcomes in patients with abruptio placenta. All the pregnant women fulfilling the inclusion criteria were considered for the study. **Results**: We had a total of 37 women with abruptio placenta during this period with an incidence of 0.4%. The incidence was higher in the age group above 30 years (40.5%) and among primiparous women (54.1%). Pre-eclampsia was identified as the most common risk factor among these women (59.5%). There were 13 women (35.1%) who had an intra-uterine fetal demise at the time of admission. The main mode of delivery among live births was caesarean section (61.5%) and that for intra-uterine fetal demise was vaginal delivery (83.3%). The maternal complications included requirement of blood transfusion (67.6%), disseminated intravascular coagulation (DIC) (3%), hypovolemic shock (11%) and ICU admission (16.2%). There was no maternal mortality among the study population. The perinatal mortality was 48.6 % comprising of 13 intra-uterine fetal demise and 5 early neonatal deaths. **Conclusion**: Abruptio placenta is associated with poor maternal and fetal outcome. Hence early detection and active management is necessary to reduce maternal and fetal morbidity. 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 placenta.

Keywords: Abruptio placenta, pre-eclampsia, live births, maternal complications.

The Royal College of Obstetricians and Gynaecologist defines antepartum hemorrhage (APH) as bleeding from or into the genital tract after 24+0 weeks till the birth of the baby. Abruptio placenta (AP) is as an important cause of

APH and accounts for 20 – 25% of all cases of APH [1, 2]. It is defined as premature separation of a normally situated placenta before the delivery of the fetus.

AP complicates approximately 0.4- 1% of all pregnancies [3]. It is classified into concealed and revealed types, where the blood collects behind the placenta and there is no evidence of vaginal bleed in concealed type and the blood tracks down between the membranes and the uterine wall to present through the vagina in a revealed abruptio placenta. The primary cause of AP in majority of the cases remains unknown but the main predisposing and precipitating factors are pregnancy induced hypertension, pre-eclampsia, advanced maternal age, multiparity, premature rupture of membranes, smoking, polyhydramnios, abdominal trauma, fetal growth restriction, intrauterine infections and past history of abruption [1, 4]. There is a tenfold increased risk in subsequent pregnancies with the diagnosis of abruptio placenta [5].

The clinical hallmarks of AP are abdominal pain and vaginal bleed with which most patients usually present [6]. The RCOG recommends that the process of triage essentially include history of pain and extent of vaginal bleed followed by an assessment of maternal cardiovascular condition. Only then should assessment of foetal well-being be attempted [1]. AP is a major cause of maternal and perinatalmorbidity and mortality [7]. It is associated with maternal complications like, disseminated intravascular coagulopathy (DIC), maternal shock, acute renal failure (ARF), postpartum hemorrhage (PPH) and anemia [1, 8]. It is also associated with undesirable fetal outcomes due to hypoxia, prematurity, growth restriction and fetal death [1, 9]. Most of the perinatal mortality is attributable to death within the uterus [10].

Abruptio placenta is a serious obstetric condition that increases maternal and neonatal morbidity and mortality. Accurate knowledge is essential for prompt diagnosis and timely intervention. Hence this study was undertaken to determine the incidence and to evaluate the risk factors that predispose to placental abruption. The primary outcomes also included the occurrence and frequency of various maternal complications and evaluation of fetal and neonatal outcomes in patients with abruptio placenta.

Methodology

This was a prospective observational study done over a period of 3 years from 2017-2020 in Bangalore Baptist hospital, a tertiary hospital in Bangalore, South India. The study population included all the pregnant women who presented with abruptio placenta and excluded pregnant women who presented with antepartum hemorrhage due to other causes. Institutional review board and ethical committee approval was obtained. All the pregnant women booked at Bangalore Baptist Hospital and fulfilling the inclusion criteria were considered for the study.

The women's demographic details such as age, gravida status, gestational age, menstrual history, past, family, and personal history were recorded. Detailed obstetric history was obtained and maternal high-risk factors like gestational hypertension, pre-eclampsia, gestational diabetes mellitus and polyhydramnios were noted. All the women underwent a complete obstetrical examination and clinical workup including general physical examination, abdominal and pelvic examination, and relevant blood investigations such as complete blood count, coagulation profile and certain biochemical markers. Since 95% of the women presented in the emergency department, placental abruption was suspected depending on clinical features of vaginal bleeding, uterine tenderness, hypertonic uterus, and diagnosis was confirmed by retroplacental clots, after delivery. After initial resuscitation, the mode of delivery was decided depending upon the condition of the mother and fetus. Fetal well-being was assessed with ultrasonography and cardiotocography. Diagnosis was confirmed by the presence of retroplacental clots which was used to estimate the amount of bleeding and severity of abruption. Abruptio placenta was graded according to PAGE classification. Maternal complications were noted down which included postpartum hemorrhage, disseminated intravascular coagulation, acute renal failure, shock, pulmonary edema and infections. Fetal outcome such as NICU admission, complications of prematurity and perinatal mortality were noted down. The data was then analysed. All information's were gathered and results were analysed.

Results

There was a total of 9042 deliveries during this study period of which 37 women were diagnosed with abruptio placenta with an overall incidence of 0.4%. The demographic characteristics of the study population was analysed as

shown in the table 1. Majority of the women were >30 years of age (40.5%). The incidence was higher in primiparous women (54.1%) and most of them were preterm pregnancies less than 34 weeks gestation (40.5%).

Table 1: Distribution among the study population based on age, parity status and ANC booking status

Variables		**Total**	**Live birth**	**Intra-uterine fetal demise**
Number of cases		37	24 (64.9%)	13 (35.1%)
Age	≤ 25 years	12(32.4%)	7(29.2%)	5(38.5%)
	26-30 years	10(27%)	6(25%)	4(30.8%)
	> 30 years	15(40.5%)	11(45.8%)	4(30.8%)
Parity	Primiparous	20(54.1%)	13(54.2%)	7(53.8%)
	Multiparous	17(45.9%)	11(45.8%)	6(46.2%)
Booking status	Registered	23(62.2%)	18(75%)	5(38.5%)
	Referred	14(37.8%)	6(25%)	8(61.5%)
Gestational age	<28 weeks	3(8.1%)	1(4.2%)	2(15.4%)
	28-33+6 weeks	15(40.5%)	11(45.8%)	4(30.8%)
	34-36+6 weeks	11(29.7%)	6(25%)	5(38.5%)
	≥ 37 weeks	8(21.6%)	6(25%)	2(15.4%)

The clinical presentation of the women diagnosed with abruptio placenta were analysed based on associated risk factors, symptoms and signs, grade of abruption according to PAGE classification as shown in table 2. Majority of women (37.8%) had pain abdomen as the primary symptom while 24.3% (9/37) had vaginal bleeding as the main symptom. Eight (21.6%) women had pain abdomen and vaginal bleeding as their primary complain.

Table 2: Clinical presentation at the time of admission

Clinical presentation		**Total N=37**	**Live birth N=24**	**Intrauterine fetal demise N=13**
Risk factors	Pre-eclampsia	22(59.5%)	13(54.2%)	9(69.2%)
	Preterm	12(32.4%)	9(37.5%)	3(23.1%)
	Unexplained	3(8.1%)	2(8.3%)	1(7.7%)
Symptoms	Loss of fetal movements (LOM)	1(2.7%)	1(4.2%)	0(0%)
	Pain abdomen	14(37.8%)	10(41.7%)	4(30.8%)
	Pain abdomen & LOM	3(8.1%)	0(0%)	3(23.1%)
	Pain abdomen & bleeding per vagina	8(21.6%)	4(16.7%)	4(30.8%)
	Pain abdomen, bleeding per vagina & LOM	1(2.7%)	0(0%)	1(7.7%)
	Bleeding per vagina	9(24.3%)	8(33.3%)	1(7.7%)
	Bleeding per vagina & LOM	1(2.7%)	1(4.2%)	0(0%)
Signs	DIC	1(2.7%)	0(0%)	1(7.7%)
	Impending eclampsia	8(21.6%)	6(25%)	2(15.4%)
	Impending eclampsia & tense abdomen	3(8.1%)	1(4.2%)	2(15.4%)
	Shock	1(2.7%)	1(4.2%)	0(0%)
	Shock & tense abdomen	3(8.1%)	1(4.2%)	2(15.4%)
	Tense abdomen	21(56.8%)	15(62.5%)	6(46.2%)
Grade of abruptio placenta	Class 0	6(16.2%)	6(25%)	0(0%)
	Class 1	5(13.5%)	5(20.8%)	0(0%)
	Class 2	9(24.3%)	9(37.5%)	0(0%)
	Class 3	17(45.9%)	4(16.7%)	13(100%)

Table 3 describes the maternal outcome among the study population which includes the mode of delivery and maternal complications such as DIC, shock, requirement of blood transfusion and maternal death. The perinatal mortality in this study was 48.6% which comprised of 13 intra-uterine fetal demise and 5 early neonatal deaths. At the time of admission, 35.1% women presented with intra-uterine fetal demise.

Table 3: Distribution showing the maternal outcome in the study population				
Outcomes		**Total N=37**	**Live births N=24**	**Intra-uterine fetal demise N=13**
Mode of delivery	Vaginal	12(32.4%)	4(16.7%)	8(61.5%)
	Cesarean section	25(67.6%)	20(83.3%)	5(38.5%)
Maternal complications	Blood transfusion	25(67.6%)	14 (58.3%)	11 (84.6%)
	DIC	1 (3%)	0	1 (7.7%)
	Shock	4 (11%).	2 (8.3%)	2 (15.4%)
	ICU admission	6(16.2%)	3(23.1%)	3(12.5%)

Discussion

Abruptio placenta is a dreaded obstetric emergency owing to its adverse maternal and fetal outcomes. AP is potentially life threatening to the mother and the fetus. The total number of deliveries during the study period was 9042, of which 37 women were diagnosed with abruption placenta. The incidence of abruptio placenta in our study was 0.4%, which was similar to the study by Sengodan SS et al who reported an incidence of 0.5% [11]. There were other studies done in India which showed incidences of abruptio placenta ranging between 1-5% [6,10,12].

Majority of women in our study was presented in the age group above 30 years (40.5%). While some studies showed a higher incidence in younger women between 20-29 years of age [4, 12]. Jabeen et al found similar age predominance as our study [13]. In our study, the incidence was higher in primiparous women (54.1%), which was in contrast with other studies [4, 11-13].

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. The study done by Khan et al [12] showed that registered cases showed a lower incidence of 35.03% compared to 64.95% in referred cases. This reflects a lower availability and quality of antenatal care at primary health center as cases registered with tertiary care center showed lower incidence. In our study, the registered cases were about 62.2% which was higher than referred cases, but the incidence of live births (75%) were higher in registered cases than referred cases.

Abruptio placenta can occur at any stage of pregnancy and clinical presentation depends on the severity of bleeding and degree of placental separation. In our study, majority of women (78%) presented at preterm which included 75 % of live births and 84.6% of intra-uterine fetal demise, similar to studies done by Coleman et al and Bibi et al [4,14]. In contrast, few studies showed higher incidence in term gestation [6, 12]. Pre-eclampsia (59.5%) was identified as risk factors in majority of women in our study which was similar to the study done by Lalit D Kapadia et al in which pre-eclampsia was the most common risk factor for abruptio placenta accounting for 48% cases [15]. Many studies have provided evidence showing strong association of hypertensive disorders with abruptio placenta [11,16-18].

Symptoms presented by the women at the time admission included pain abdomen, bleeding per vagina, loss of fetal movements, wherein almost all had presented with the classical symptoms of abruptio placenta (pain abdomen and bleeding per vagina) consistent with other studies [2,4,11]. On examination, tense abdomen was noted in about 73% women. They also presented with impending signs of eclampsia (30%), shock (11%) and DIC features (3%). Cases were analysed based on the grades of abruptio which showed 16.2% of class 0, 13.5% of class 1, 24.3% of class 2 and 45.9% of class 3. At the time of admission, 35.1 % women presented with intra-uterine fetal demise.

Among the study population, 32.4% women had vaginal delivery and 67.6% women had undergone caesarean section. Subgroup analysis was done between live births and intra-uterine fetal demise. The analysis showed that 16.7% women had vaginal delivery and 83.3% women underwent caesarean section among the live birth group. The indication for caesarean in this group was mainly fetal distress. Among the intra-uterine fetal demise group, 61.5% women had vaginal delivery and 38.5% women underwent caesarean section wherein caesarean section was done in view of deteriorating maternal condition. On review of literature, the mode of delivery was variable, and this could be attributed to maternal and fetal condition at the time of admission, institutional protocols and availability of resources [12, 19].

The maternal and fetal complications were assessed and analysed. The maternal complications included blood transfusion, shock, DIC and ICU admission. Blood transfusion was done in about 67.6% women which included 58.3% of women who had live births and 84.6% of women who had intra-uterine fetal demise. The incidence of DIC and shock in this study was 3% and 11% respectively. 16.2% women required ICU admission during their hospital stay which included 23.1% of live births and 12.5% of intra-uterine fetal demise. Other studies have also reported maternal complications like need of blood transfusion, DIC, shock and ICU admission [11,12,15].

The perinatal mortality in this study was 48.6% which comprised of 13 intra-uterine fetal demise and 5 early neonatal death. Such a high rate was due to intra-uterine fetal demise which had occurred in 35.1% cases of abruptio placenta leading to poor prognosis as there is late presentation of the patient to the hospital, during which time the disease progress to an advanced stage. Extreme prematurity was identified as cause in early neonatal death. Higher perinatal mortality was noted in other studies also owing to severity to abruption and prematurity [11,15,19].

Conclusion

Abruption placenta is a grave and potentially life-threatening condition for mother and fetus. It remains as a dreaded presentation which can give nightmares to an obstetrician and tests the limitation of the best equipped obstetrical and neonatal units. There can be varying risk factors and clinical features in abruptio placenta. Proper antenatal care to identify the risk factors like extreme age groups, hypertensive disorders plays an important role in decreasing the incidence of abruptio placenta. These women should be managed in centers where advanced maternal and neonatal facilities are available involving a team of obstetricians, intensivists and neonatologist for better maternal and fetal outcome. Early detection and active management is necessary to reduce maternal and fetal morbidity. 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 placenta.

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