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Risk Factors and Foetal-Maternal Outcome in Placental Abruption

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ABSTRACT

Objective: To determine frequency, obstetrical risk factors and the subsequent feto-maternal outcome in women suffering from placental abruption.

Methods: A retrospective case series study was carried out in the Department of Obstetrics and Gynaecology in S.C.L. HOSPITAL, Ahmedabad from July 2015 to June 2016. All women with the diagnosis of placental abruption having more than 24 weeks gestation were included in the study.

Results: Of the 4200 delivered women 50 (1.2%) had placental abruption. All of the 32 women were unbooked, with 24 (70%) in the age group 21-30 years, 10 (33.3%) patients were primigravida. The commonest medical disorders observed were anaemia in 12(40%) and gestational hypertension in 10 (33.3%) . There was no maternal death. There was 1(3.3%) hysterectomy. The foetal prognosis was characterized by low birth weight seen in 18(60%), low apgar score in 4 (13.3%), still birth rate in 8 (26.7%) and perinatal mortality rate in 10(33.3%).

Conclusion:

Placental abruption can result in significant morbidity in both mother and fetus. Multiparity, un-booked status, rural residence and maternal anaemia are important risk factors

KEYWORDS: Anemia, Antepartum haemorrhage, maternal morbidity, perinatal mortality

INTRODUCTION:

Accidental haemorrhage is a grave obstetrical emergency that refers to bleeding at the decidual-placental interface which causes placental detachment over 28 weeks of gestation age and prior to delivery of the fetus [1]. It has been variously called placental abruption, abruptio placentae, and in Great Britain, accidental hemorrhage.

Accidental haemorrhage is seen more often in the multiparous than the primigravida patient, and in a series from the records, the unbooked multiparous showed a high proportion of the numbers admitted with accidental haemorrhage. Age of the patient to be of little significance.

This condition deprives the fetus of oxygen and nutrition, leading to both short term and long-term consequences among survivors [1,2]. Placental abruption is risky for both mother and fetes.

WHO reported maternal mortality rates due to Abruptio placenta worldwide was 2.1% and fetal perinatal mortality rate was 15% while its incidence was 0.65% [3]. In developed countries, approximately 10% of all preterm births and 10–20% of all perinatal deaths are due to placental abruption [4]. In developing countries, more maternal deaths are said to be caused by pre-existing maternal anaemia [3]. Maternal mortality rate in India is 301 per 10,000 live births. Causes are 38%- haemorrhage, 33%- condition, 8% abortion, 5%- obstructed labor, 5%- hypertensive disorder, 11%- sepsis [5]. Premature separation of placenta occurs in 1% of all pregnancies. It is an important cause of still birth, preterm delivery, early neonatal death and even maternal death. Placental abruption accounts for 20-25% of Ante partum haemorrhage. Perinatal mortality rate varies between 2-6 % depending upon gestational age, fetal weight and degree of abruptio placenta. Over 50% of all perinatal death occurs before delivery [6]. Depending on presentation and severities, accidental haemorrahge has several maternal and perinatal adverse outcomes includes preterm birth, perinatal death, perinatal asphyxia, maternal death, and prolonged hospital stay; knowing predictors of these adverse outcomes will help clinician better placed in the management.

The management of abruption should be individualized on a case-by-case basis depending on the severity of the abruption and the gestational age at which it occurs.

This study aims to understand the incidence and predictors of adverse outcomes of Accidental haemorrhage in our setting and Knowledge from this study will help in determining the outcomes and designing management strategies improving Foetal maternal outcomes and patient care. This information will help to give predictors of good and bad outcomes. This study will also form a good baseline for future research.

OBJECTIVES

i. To determine the prevalence, risk factors and clinical profile of accidental haemorrhage in patients admitted in SCL general hospital
ii. To determine the feto-maternal outcomes in accidental haemorrhage among admitted patients
iii. To determine the predictors of perinatal death, maternal death/survival and prolonged hospital stay for patients with accidental haemorrhage.

METHODS & MATERIAL

STUDY DESIGN

A retrospective case series study was carried out in the Department of Obstetrics and Gynaecology in S.C.L. General Hospital, Ahmedabad from July 2015 to June 2016. All women with the diagnosis of placental abruption having more than 24 weeks gestation were included in the study.

STUDY AREA

The study was carried in the department of Obstetrics and Gynecology at Smt. SCL general hospital, affiliated to N.H.L Municipal medical college. This is a teaching and referral hospital. The maternity unit comprises the antenatal ward and labor ward. Mothers who need intensive care are admitted to the

Adult ICU while babies are admitted to Neonate ICU.

STUDY POPULATION
Pregnant mothers diagnosed with accidental haemorrhage and their babies born at Smt. SCL general hospital were included in the study.

INCLUSION CRITERIA
All pregnant women diagnosed to have abruption placenta from 28 weeks of gestation and above; all babies delivered by mothers with abruptio placenta at Smt. SCL general hospital were included in the study.

EXCLUSION CRITERIA
All Pregnant women with vaginal bleeding due to other causes of APH; and referred patients who delivered outside the hospital were excluded.

Study instrument
Pre-structured, pre-tested questionnaire, clinical examination, and laboratory investigation will be used.

OBSERVATION
Accidental haemorrahge is considered to be a grave obstetrical emergency, because if not diagnosed and managed at the earliest, it results in maternal and perinatal morbidity and mortality. It is of serious concern in the developing world. Our study was conducted in a tertiary care center located in an urban slum area over a period of one years, total 4200 deliveries were conducted during this period out of which 50 cases were diagnosed as accidental haemorrhage giving an incidence of 1.2%. This is comparable to other studies of Arora R et al & Bhide GA et al where the incidence of abruptio placenta ranges between 2-6%.

TABLE 1: AGE DISTRIBUTION OF CASES

Age	No. of patients	Percentage	Pariente et al	Seema bibi et al
Less than 20 years	2	6.7%		
21 – 25 years	15	50%	67.7%	63%
26 – 30 years	9	30%		
31 – 35 years	3	10%		
36 – 40 years	1	3.3%		

The majority of the females (24) belonged to the reproductive age group of 21-30 years. Pariente et al and seema bibi et al reported a similar incidence of 67.7% and 63% in this age groups. Only 2 (6.7%) were below 20 years and 1 were above 35 years. Certain studies (Kramer MS et al) have shown a positive association of abruption with advancing age, but in our study most of the females belonged to younger age group.

TABLE 2: PARITY

Parity	No. of patients	Percentage	Sarwar et al	Singhal et al	Talpur et al
Primigravida	10	33.3%		36%	20%
2 – 4	18	60%	49%	64%	28%
5 – 7	2	6.7%			52%
8 and above	0	0.0%			

the women sampled, 18(60%) fell within parity range of 2-4, 10 (33.3%) of them were primigravida and only 2 patients were grand multiparous. Thus the present study would tend to support multiparity as a risk factor for accidental haemorrhage which gave similar results in comparision to studies done by sarwar et al and singhal et al which accounted to 49% & 64%. Where as in study conducted by talpur et al grand multiparity was noted as a predisposing factor for abruptio placentae which showed a conflict from our study.

TABLE 3: RELATIONSHIP WITH RISK FACTORS

Risk factors	No. of patients	Percentage	Seema bibi et al	Ananth et al	Musarrat et al
Anemia	12	40%	79%		86.09%
Eclampsia	1	3.3%			3.31%
Hypertension	10	33.3%	8%	15.6%	19.86%
Trauma	1	3.3%			1.32%
Multiple pregnancy	0	0			
PROM	3	10%			3.3%
H/o previous abruption	1	3.3%			
H/o previous MTP	2	6.8%			

A total of 12(40%) women in our study were anaemic which was a little less as compared to seema bibi et al and musarrat et al reporting 79% and 86.09%. Patients with associated medical disorder was high in our scenario majority being anaemic and hypertensive. This high frequency of anaemia could be due to pre-existing nutritional deficiency and then superimposed by abruption. An association of anaemia and hypertension with placental abruption was observed in present study, which is similar with other studies . Altered fetoplacental angiogenesis during early pregnancy in anemic woman may partially explain this increased risk. However a poor socio economic status confers a degree of malnutrition and anaemia on patients, which could result in poor placental structure formation, including villi and blood vessels.

Hypertensive vasculopathy may affect placental vasculature which may succumb to sudden rise in blood pressure. The patients 10 (33.3%) in our study had a higher frequency of hypertension in comparison to studies conducted by seema bibi et al and musarrat et al having incidence of 15.6% and 19.86% , the actual number of hypertensive patients may have actually been higher keeping in view the history of past hypertensive disorder, but may have been masked by lower blood pressures related to bleeding per vaginum subsequent to abruptio placentae. The association of abruptio placentae with hypertension has been studied by other authors as well. Abdella et al [7] noted in a study of 265 cases of abruption that the incidence of abruption was highest with eclampsia (23.6%), followed by chronic hypertension (10.0%) and pre eclampsia (2.3%). The study concluded that hypertension is associated with an increased risk of abruption; furthermore the degree of this increased risk is clearly dependent upon the specific type of hypertensive disorder. Sharief and Manther in their study [8] compared 50 hypertensive and 104 normotensive cases of abruptio placentae and concluded that there was an increased incidence of abruptio in the hypertensive females of age group 15-20 years, and abruptio placentae grade III occurred significantly more often in the hypertensive group. Studies have shown that preeclampsia and smoking are the most important risk factors associated with abruption. However, smoking was not a common habit of women in our society and hence not analyzed. Ananth CV et al has reported that the relative risk of abruptio is 3.8 times for severe preeclampsia, In our study 3.3% cases were seen having eclampsia which conformed to studies reported by Abu-Heija A et al and Kramer MS et al.

The greatest determinant of abruption risk is an abruption in a prior pregnancy. This was quantified by Ananth and Colleagues in tometa-analysis. The risk increased 15 to 20 fold in subsequent pregnancies when an earlier pregnancy was complicated by abruption. In present study 3.3% of pregnancies again complicated by abruptio placenta which co-relates with the same. Increased frequency of PROM was seen in 10% of the patients of our study compared to musarrat et al showing incidence of 3.3.%.

TABLE 4: MATERNAL MORBIDITY

Complication	No. of patients	Percentage	Sarwar et al	Pitaphrom A et al	Musarrat et al
PPH	5	16.7%	18.9%		14.56%
Renal failure	1	3.3%	0.5		1.98%
DIC	2	6.67%	10%	5.8%	16.55%
Haemorragic shock	1	3.3%		19.4%	
Mechanical ventilation	0	0			
Hysterectomy	1	3.3%			
Mortality	0	0	0.1		1.32%

Maternal adverse outcome which were found in this study includes PPH (16.7%), renal failure (3.3%), DIC (6.67%), hysterectomy(3.3%), shock (3.3%) and no mortality. Among maternal complications PPH was the commonest, followed by disseminated intravascular coagulation, shock and renal failure. This study was compared with a study done by Pitaphrom A, et al, who found 103 cases of abruption, hemorrhagic shock in 19.4% and DIC in 5.8% . Maternal mortality incidence varies from <1% to 8.3%.This can be attributed to improved obstetric care, timely interventions and availability of blood and blood components.

Fortunately there was no maternal mortality in our study. Major maternal complication seen was postpartum hemorrhage, which was similar to the findings by Singhal et al (2008)(21%), Sheikh et al (2010) (19%) and Musarrat et al (14.56%). Hysterectomy for controlling post partum haemorrhage was performed in only one (3.3%) case, DIC was strongly associated with placental abruption and is a major contributor to poor maternal outcome , in our study all recovered with adequate blood transfusion, component therapy and hemodynamic support and renal failure in this study was not severe and only conservative management resulted in complete recovery.

TABLE 5: PERINATAL OUTCOME
A) Fetal outcome

Complication	No. of patients	Percentage	Sarwar I et al	Arora R et al	Musarrat et al
Alive	22	73.3%			49.36%
Still birth	8	26.7%	67.9%	53.5%	50.63%

B) Birth weight

Birth Weight (gms)	No. of patients	Percentage	Arora R et al	Seema et al	Musarrat et al
1000-1499	3	10%			29.11%
1500-2499	15	50%	67%	51%	58.22%
2500-3999	12	40%			6.32%
4000+	0	0			6.32%

C) APGAR score

APGAR score	No. of Patients	Percentage	Iram et al
0	8	26.7%	58.5%
1 – 4	4	13.3%	9.4%
5 – 10	18	60%	32.1%

Perinatal mortality has been strongly associated with AP in both local and international literature. A local study from our Northern province, found the perinatal mortality around 59%. In above study, eight (26.7%) patients had intra uterine fetal mortality and a total of 10 (33.3%) neonatal deaths occurred. It is probable that all these deaths occurred due to abruptio placentae. Out of these 22 live born babies two died in early neonatal period due to birth asphyxia and prematurity related complications. Therefore overall perinatal mortality was 33.3%. Increased perinatal mortality was seen with preterm gestation. In our study, the association was found much stronger for moderately preterm gestation in conflict with Ananth study, where association was far stronger with very preterm gestation. Perinatal mortality in our study was less compared to studies done by Sarwar I et al, Arora R et al and Musarrat et al.

The neonatal weights ranged from 1.0 -4.0 kg, the distribution pattern shows 15 (50%) neonates in the range 1500-2499 gms, 3 (10%) neonates in the range 1000-1499 gms and 12 (40%) neonates in the range 2500-3999 gms. There was a significant correlation between low birth weight and abruptio placenta. Our results were similar to 54.9% found in the study conducted by Pariente et al.4 This could be because the pregnancies required earlier termination due to the severity of the disease.

Neonatal APGAR score at one minute was 0 in 8 (26.7%) cases. The distribution of APGAR score for the rest 22 cases was 4 (13.3%) cases in the 1-4 group, and 18 (60%) cases in the 5-10 group.

DISCUSSION:

Accidental haemorrahge is considered to be a grave obstetrical emergency, because if not diagnosed and managed at the earliest , it results in maternal and perinatal morbidity and mortality. Abruptio placenta remains a major cause of perinatal morbidity and mortality globally, though of most serious concern is in the developing world. A total of 21600 deliveries were conducted during a period of 3 years out of which 92 cases were diagnosed as accidental haemorrhage giving an incidence of 0.4%. This is comparable to other studies done in developing countries where the incidence of abruptio placenta ranges between 2-6% [9-12]. This is due to contributing factors like low socioeconomic conditions, ignorance about antenatal care and poor control of predisposing and precipitating factors.

Increased incidence was seen in patients belonging to rural areas and unbooked. Relation between age ,parity and incidence of abruption appears to be varying in different studies. Abruption can occur at any stage in pregnancy but 34-36 weeks appears most vulnerable period and incidence rates vary considerably depending on the etiology [13].]. However, studies which were done in developed countries reported a low incidence of abruptio placenta ranging 0.5%-2% [1, 14]. Early detection and management of modifiable risk factors for placenta abruption in developed countries might have helped to reduce the incidence of placenta abruption.

This study was conducted in a tertiary care hospital which is situated in rural area. Therefore patients with associated medical disorder was high in our scenario. Majority of patients were anemic. These observations are also seen in other studies [15,16].This high frequency of anemia could be due to pre-existing nutritional deficiency and then superimposed by abruption. An association of anemia and hypertention with placental abruption was observed in present study, which is similar with other studies [17,18]. Altered fetoplacental angiogenesis during early pregnancy in anaemic woman may partially explain this increased risk[19]. This high frequency of maternal anaemia is reflective not only of the bleeding of abruptio placentae but is aggravated by an underlying chronic maternal nutritional deficit common in this country. The majority of patients belonged to the poor socio economic group . This may be an indication of the referral pattern of poor patients to our hospital rather than a true risk factor. However a poor socio economic status confers a degree of malnutrition and anaemia on patients, [20,21] which could result in poor placental structure formation, including villi and blood vessels.

Hypertensive vasculopathy may affect placental vasculature

which may succumb to sudden rise in blood pressure. The patients in this study had a frequency of hypertension in 33.3% cases , the actual number of hypertensive patients may have actually been higher keeping in view the history of past hypertensive disorder, but may have been masked by lower blood pressures related to bleeding per vaginum subsequent to abruptio placentae. The association of abruptio placentae with hypertension has been studied by other authors as well. Abdella et al [7] noted in a study of 265 cases of abruption that the incidence of abruption was highest with eclampsia (23.6%), followed by chronic hypertension (10.0%) and pre eclampsia (2.3%). The study concluded that hypertension is associated with an increased risk of abruption; furthermore the degree of this increased risk is clearly dependent upon the specific type of hypertensive disorder. Sharief and Manther in their study [8] compared 50 hypertensive and 104 normotensive cases of abruptio placentae and concluded that there was an increased incidence of abruptio in the hypertensive females of age group 15-20 years, and abruptio placentae grade III occurred significantly more often in the hypertensive group.

Majority of the studies which have been done on the subject are from the West have taken maternal age > 35 years as a significant risk factor for AP [22]. Our also showed significant association of AP with maternal age.

Abruptio placenta is identified to be an important cause for fetal and perinatal morbidity. There was a significant correlation between low birth weight and abruptio placenta. Our results were similar to 54.9% found in the study conducted by Pariente et al.4 This could be because the pregnancies required earlier termination due to the severity of the disease. A local study from our Northern province, found the perinatal mortality around 59%.7 In above study, there were a total of 10 (33.3%) foetal deaths. Statistical analysis in our study showed significant association with gestational age. Increased perinatal mortality was seen with preterm gestation. In our study, the association was found much stronger for moderately preterm gestation. In our study, the association was much stronger to low birth weight, birth asphyxia (low Apgar score), maternal anemia, preterm gestation (28-32wks), and high volume of retroplacental clot; as similar finding reported by Ananth et al, 2008, where association was stronger with preterm gestation with low birth weight and increased volume of retro-placental clot [23].

Among maternal complications PPH was commonest, followed by disseminated intravascular coagulation, puerperal sepsis, shock and renal failure, which is similar to other[24]. No maternal mortality was noted. Maternal mortality incidence varies from <1% to 8.3%[5].This can be attributed to improved obstetric care, timely interventions and availability of blood and blood components. This study was compared with a study done by Pitaphrom A, et al, who found 103 cases of abruption, hemorrhagic shock in 19.4%, couvelaire uterus in 16.5% and DIC in 5.8% [24]. The study showed that the major maternal morbidities that were associated with APH were , disseminated intravascular coagulation and postpartum haemorrhage, which is similar to the findings by Singhal et al (2008) and Sheikh et al (2010).

To conclude, there is no doubt that abruptio placentae represents a potentially serious obstetric problem that tends to threaten fetal viability, neonatal mortality and morbidity and maternal health and well being.

It can be said based upon the present study that there is a high frequency of abruptio placentae in our setting and that the consequences of abruptio placentae for neonatal mortality outcome are alarmingly high. The majority of patients of perinatal mortality presented with intra uterine death so that any management protocol directed at abruptio placentae or its consequences is of little help in preventing perinatal mortality.

Conclusion:

The frequency of abruptio placentae is alarmingly with adverse maternal and foetal outcome. Multiparity, unbooked status, rural residence and maternal anaemia are important risk factors. Early intervention, expeditious delivery and strengthening of safe motherhood services particularly in rural areas, will help to prevent and reduce the gravity of the situation.

Close attention to maternal condition, with replacement of blood and blood products as indicated, may improve outcomes for the mother. The predictors of maternal adverse outcomes were found to be DIC, anemia, PPH, ICU admission and maternal shock. Ideally all women at risk should have regular and frequent antenatal checkups at a tertiary center where operating facilities, blood transfusion services and neonatal care are available.

Predictors for perinatal death was found to be low birth weight, birth asphyxia, maternal anemia, low Apgar score, retroplacental clot volume above 500 ml. Perinatal mortality is determined by the severity of the abruption and the gestational age at which it occurs. When abruption does occur, there are some strategies that may help minimize the risks of morbidity and mortality associated with this condition. These include early recognition and prompt delivery in cases in which the fetus is mature and, in stable cases remote from term, conservative management to enable steroid administration, allow transfer to a center with facilities for care of the preterm infant, and in some cases, permit fetal maturation before delivery. Despite advances in medical technology, the diagnosis of abruption is still a clinical one. Immediate intervention by the obstetrician and active resuscitation by the neonatologist is the key to improve maternal and perinatal outcome in women presenting with abruptio placenta.

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