ORIGINAL ARTICLE

Frequency of maternal morbidity and mortality associated with placental abruption

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Abstract:

Background: Placental abruption is a serious obstetric condition that increases maternal and neonatal morbidity and mortality. Maternal complications include hemorrhagic shock, coagulopathy and disseminated intravascular coagulation (DIC), renal failure, ischemic necrosis of distal organs and death.

Objectives: To determine the frequency of maternal morbidity and mortality associated with placental abruption.

Study design and setting duration: This cross sectional study was conducted at in/out patient department of Gynaecology & Obstetrics, Sandeman, Civil Hospital Quetta from 1st January, 2016 to 31st December, 2020.

Material and Methods: A total of 120 patients diagnosed as placental abruption cases were included in this study. All patients were unbooked emergencies. On basis of history, examination and investigations, outcome measures like hemorrhagic shock, acute renal failure, DIC, Post-partum hemorrhage and mortality (Yes/No) were noted according to operational definitions.

Results: Mean age of the patients was 1.933±0.670 years. Mean gestational age was 2.266±0.796 weeks. Previous history of abruption in 20(16.7%) patients, hypertension/pregnancy induced hypertension in 26(21.7%), preterm labor in 31(25.8%), premature rupture of membranes in 11(9.2%) and maternal smoking/substance abuse in 12(10.0%) patients. Maternal complications observed were hemorrhagic shock (15.8%), acute renal failure (13.3%), disseminated intravascular coagulation (DIC) (12%) and post-partum hemorrhage (29.2%). Mortality rate was (10%).

Conclusion: Placental abruption had a profound impact on maternal complications causing DIC, hemorrhagic shock, acute renal failure and postpartum hemorrhage and deathin the unbooked pregnant women.

Keywords: Abruption placenta, maternal morbidity, mortality

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Introduction:

Placental abruption is defined as, early separation of a placenta from the lining of the uterus before completion of the second stage of labor. It is one of the causes of bleeding during second half of pregnancy and is a rare but serious complication of pregnancy that places both mother and fetus at risk.[1]

It occurs on average in 0.5%, or 1 in 200, deliveries. Placental abruption is a significant contributor to maternal and fetal mortality worldwide.[2] Multiple gestation pregnancies, polyhydramnios, pre-eclampsia, sudden uterine decompression, advance maternal age, short umbilical cord and finally trauma to the abdomen may precipitate placental abruption.[3]

Most of the times placental abruptions occur before 37-weeks gestation.[4] Fetal mortality rates of 1-40% have been reported and each year in the US, about 1-5% of maternal deaths are linked to

placental abruption. Recurrence rates of 3-10% are reported.[5] If the abruption placentae in 2 consecutive pregnancies, the risk of recurrence rises to 25% and the risk of fetal death are 7%.[6]

The women are at risk for developing hemorrhage and the need for blood transfusions, hysterectomy, bleeding disorders specifically disseminated intravascular coagulopathy, renal failure, and Sheehan syndrome or post-partum pituitary gland necrosis.[7] The prognosis depends on provision of treatment, quality of treatment, and on the severity of the abruption. Outcomes for the baby also depend on the gestational age. In the Western world, maternal deaths due to placental abruption are rare; as shown by the a study done in Finland between 1972 and 2005 placental abruption had a maternal mortality rate of 0.4 per 1,000 cases (1 in 2,500 women died). The prognosis on the fetus is worse, in the UK, about 15% of fetuses die following this event.[8]

A retrospective study was done involving all pregnant women who had abruptio placenta from 2012 to 2016. Data on socio demographic characteristics, risk factors, and fetal and maternal morbidity and mortality were extracted from patientscase notes for analysis. The prevalence of abruptio placenta was 1.03%.[9]

Hypertensive disorder was the most important risk factor, seen in 53.1% of the subjects. Birth asphyxia was the major perinatal morbidity and was found in 42.9% of the babies, whereas 46.9% were still births. The caesarean section rate was 63.3%. 40-subjects 81.6% had blood transfusion, 17 subjects 34.7% had postpartum hemorrhage, Puerperal Pyrexia 12.2%, acute renal failure 12.2%, coagulation disorders 4.1%, hysterectomy 8.2% and 40.8% had post-partum anemia. There were 2-maternal deaths giving a case-specific fatality rate of 4.1%.[10]

Regarding contemporary status of management and preventive strategy of placental abruption in study setting hospital is that every woman in early antenatal period should be evaluated fully for any of the risk factors, and if found should be highlighted as High Risk Pregnancy. Such women are scheduled to attend antenatal clinics more frequently so that adequate measures will be taken whenever indicated before any fetomaternal complication arises. Sandeman Provincial Hospital, Quetta is a tertiary care hospital providing health care facilities to a wide area covering the Balochistan. We are receiving lots of unbooked cases of placental abruption and its complication in our day today emergency. No local data is available in our local population with regard to the burden of problem. The purported significance of the study is to observe the frequency of maternal morbidity and mortality associated with abruption placenta in unbooked cases and to generate the local data which will help to improve the preventive measures and maternal outcome by educating females of child bearing age and planning prompt management of future cases of placental abruption.

Material and Methods:

Total 120 patients were enrolled in this study; ethical approval for the study was gained from the hospital ethics committee before initiating study enrollment. After taking an informed consent from the patients, all patients fulfilling the inclusion criteria were enrolled for study. The pregnant women age 20-35 years diagnosed case of abruption placenta were included in study. The following information was extracted: age of the patients, parity, educational status, booking status, risk factors for abruption placenta. After explaining the purpose of study and procedure to the patients, blood is withdrawn by the postgraduate Resident by taking all aseptic measures and stored in two serum bottles and one bottle for PT, aPTT. All three samples could be clearly marked with patient's name, admission number and OPD number, one serum bottle would be sent to outside laboratory for measurement of Serum fibrinogen level. Serum fibrinogen level were checked by using Abbott heckcure kit.

The 2nd sample was sent to Sandeman civil hospital for checking PT, aPTT to rule out disseminated coagulopathy. The 3rd sample was sent to the same hospital lab for checking hemoglobin level and cross matching. The reports

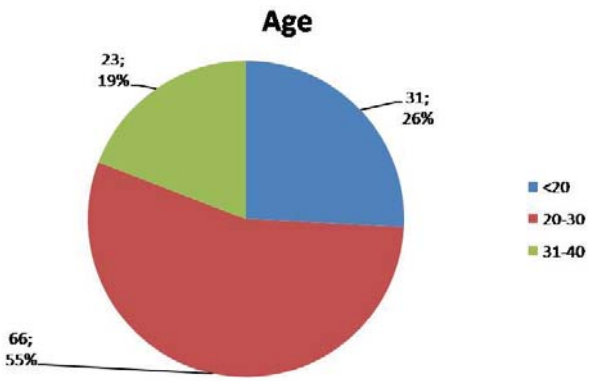

Figure 1. Distribution of cases by age

Table 1: Distribution of cases by parity, gestational age

Age (Year)	Number N=120	Percentage	Mean±SD
Cases by Parity			
Primigravida	21	17.5%	2.250±0.881
2-4	62	51.5%	
5-7	**23**	19.2%	
> 8	14	11.7%	
Gestational age			
< 30	26	21.7%	2.266±0.796
30-36	36	30.0%	
> 36	58	48.3%	

Table 2: Distribution of cases by risk factors, haemorrhagic shock, acute renal failure, (DIC), maternal mortality

Risk Factors	Number	Percentage
Past history of abruption	20	16.7
HTN/PIH	26	21.7
Preterm labour	31	25.8
Premature rupture of membranes	11	9.2
Maternal smoking/ substance abuse	12	10.0
Haemorrhagic Shock		
Yes	19	15.8
No	101	84.2
Acute renal failure		
Yes	16	13.3
No	104	86.7
Disseminated intravascular coagulation (DIC)		
Yes	12	10.0
No	108	90.0
Postpartum haemorrhage		
Yes	35	29.2
No	85	70.8
Mortality		
Yes	12	10.0
No	108	90.0.

were collected by post graduate resident. The results were recorded on proforma designed accordingly. Variables which were noted patient's age, hemoglobin level, temperature, urea, creatinine level and PT, aPTT level. The data was analyzed by SPSS software version 21. Descriptive statistics were calculated for all variables like (age, gender, hemoglobin, urea, creatinine and fibrinogen level). Frequency and percentage were presented for qualitative variables like (age, maternal morbidity and mortality). Effect modifiers like (age, gender, maternal morbidity and mortality) were controlled by stratification. Post stratification chi-square test was applied. placenta previa, DIC (Disseminated intravascular Coagulopathy), pregnant women using cocaine and tobacco during third trimester, pregnant women with previous history of placental abruption or previous caesarian section, Pre-eclampsia, Thrombophillia unbooked cases, maternal age younger than 20 or older than 35 that were excluded form study.

Results:

Regarding distribution of cases by age, 31(25.8%) patients were <20 year, 66(55.0%) patients were between 20-30 year and 23(19.2%) patients were between 31-40 year old with mean age of 1.933±0.670 years as shown in figure no.1.

Parity distribution as follows: primigravida were 21(17.5%), 62(51.7%) patients had parity 2-4, 23(19.2%) patients had parity 5-7 and 14(11.7%) patients had parity > 8 as shown in table-1.

Distribution of cases by gestational age shows, 26(21.7%) patients having <30 weeks gestation, 36(30.0%) patients having 30-36 weeks while 58(48.3%) patients had gestational age >36 weeks with mean gestational age of 2.266±0.796 weeks as shown in table-1. Previous history given as abruption in 20(16.7%) patients, hypertension/pregnancy induced hypertension in 26(21.7%), preterm labour in 31(25.8%), premature rupture of membranes in 11(9.2%) and maternal smoking/substance abuse in 12(10.0%) patients as shown in table-1.

Following maternal complications were observed, hemorrhagic shock (15.8%), acute renal failure (13.3%), disseminated intravascular coagulation (DIC) (12%) and postpartum hemorrhage (29.2%). Mortality rate was (10%) as shown in table 2

Discussion:

Placental abruption is still a grave obstetrical emergency. Global mortality for mothers during child birth is about 500,000 each year and majority of maternal deaths occur in developing world. The incidence of placental abruption appears tobe decreasing due to improved antenatal care, still it has been reported to be present in 0.3-2.2% of pregnancies in western countries.[1] In Pakistan the incidence up to 7% has been reported.[11,14] It is associated with significant maternal morbidity and mortality due to severe hemorrhage causing shock, acute renal failure and DIC.[4] The perinatal morbidity and mortality is due to prematurity, IUGR and intrauterine death.[12,13]

This study was conducted at a tertiary level hospital where complicated cases from a large no of private hospitals, clinics and other health care centers located far away from province are referred.

During the study period of six months, total 120 patients diagnosed as a case of placental abruption were taken and observed for the complications associated with abruption. All cases of placental abruption taken were unbooked emergencies.

Maternal age in this study shows that 31(25.8%) patients were <20 years while 55(55.0%) were between 20-30 years and 23(19.2%) were between 31-40 years old. So teenage pregnancy in this study was associated with placental abruption which is contrary to the study conducted at Mulago Hospital, Kampala, Uganda in which teenage pregnancy was not associated with placental abruption.[5]

Regarding parity distribution in my study, 21(17.5%) of patients were primipara while 51.7% of patients were multipara. Among multipara 51.7% had parity from 2-4 and 19.2% were grandmultiparas. So multiparity is a significant risk factor of placental abruption which is in support of many studies.[1]

Distribution of cases by gestational age in this study shows that mean gestational age at delivery in patients of placental abruption was 2.266±0.796 weeks. This frequency is approximately the same as indicated in a study by Pitaphrom MD.[8]

In this study the no of patients with prior history of placental abruption were 16.7% which is higher as compared to what documented in the world literature. The recurrence rate after an abruption is 10% and after two previous episodes the risk is approximately 20%.[11] Thus it is very important to monitor a patient with a previous history of abruption.

The frequency of HTN/PIH in current study was 21.7% which was in agreement with previous reports mentioning HTN as an important risk factor.[12]

In this study frequency of preterm premature rupture of membranes (PPROM) was 9.2% which was less than as reported by Salafia et al who observed occult decidual hemorrhage and retrochorionic hematoma in 37.5% of patients with PPROM compared with 0.8% at term.[14]

Maternal smoking/substance abuse was 10.0% in this study which was less than what has been reported in other studies i.e. 10.6%.[15] This may be due to the reason that cigarette smoking by women is socially condemned. Smoking is a preventable risk factor for adverse pregnancy outcomes including placental abruption.[13]

The incidence of hemorrhagic shock and PPH in the present study was 12% and 24.4% respectively, which is higher as mentioned in the study done by Pitaphrom et al, who found 103 cases of abruption, hemorrhagic shock in 15.8% and couvelier uterus leading to PPH in 16.5% of cases. Commonest cause of PPH in this study was uterine atony followed by coagulation failure.[8]

DIC is a life threatening complication of placental abruption for both mother and fetus. This study estimated that DIC was found in 10.0% of cases which is about 4 times higher than the proportion of DIC(2.5%) reported by Ellahi and Khalid at Nishtar Hospital Multan.[16-18]

Renal failure which occurred in this study (13.3%) was low as compared to 14% of Nizam et al.[76] Most of the cases were not very severe and as advised by expert nephrologist only conservative management resulted in complete recovery.

Maternal mortality rate in this study was 10.0%, while mortality rate quoted in another study by Farooq et al was 8.3%.[4] The common cause of mortality due to placental abruption was that, most patients reported late to the hospital, so that there was a very short window of opportunity for intervention to promote a successful outcome. Also in some patients coagulopathy appears to be the main cause of mortality, which though have been managed aggressively enough, but due to late presentation did not result insurvival of patients.

Conclusion:
Public sector hospitals should be equipped with requisite materials including round the clock availability of blood and blood products. And postgraduate training should also be given in hematology as well.

Family planning should also be emphasized as a strategy towards reduction of parity and there by the incidence of placental abruption.

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Role and contribution of authors:
Prof Dr Naila Ehsan, collected the data, references and did the initial writeup.

Dr Rohana Salam, helped in collecting the data and also helped in introduction writing.

Dr Safia Jan, helped in collecting the references and also helped in abstract writing.

Dr Muhammad Iqbal Khan, helped in collecting the data and also helped in discussion writing..

Dr Ali Nawaz Kanrani, critically review the article and made final changes

Dr Saira Bibi, collected the references and also helped in material and methods writing.

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