

COMPARATIVE STUDY OF THE MATERNAL AND FETAL OUTCOME OF WOMEN WHO PRESENTED WITH ABRUPTIO PLACENTA AND PLACENTAL PRAEVIA AT THE UNIVERSITY COLLEGE HOSPITAL, IBADAN: A-10-YEAR REVIEW

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ABSTRACT

Context: Antepartum haemorrhage is a grave and potentially life threatening condition and a major cause of both maternal and fetal mortality.

Objective: To compare the fetal and maternal outcome of patients with abruption placenta and placental praevia.

Design/Setting/Subjects: A retrospective comparative study conducted among pregnant women who presented with antepartum haemorrhage at the University College Hospital between January 1997 to December 2006.

Main Outcome measured: Prevalence of antepartum haemorrhage, mode of delivery, fetal and maternal outcome.

Results: There were 11,815 deliveries over the study period, of which 385(3.25%) had antepartum haemorrhage. Out of these patients with antepartum haemorrhage, 182(1.5%) had placental praevia, 117(1%) had abruption and the rest had antepartum haemorrhage due to other causes such as cervicitis and cervical cancer in pregnancy. Of those who had caesarean delivery 16% was due to abruption while 84% was due to placental praevia. Abruptio placenta accounted for 67.5% of perinatal mortality while 32.5% was due to placental praevia, these were statistically significant $P < 0.05$. Maternal mortality rate was similar in both groups (1% of the study population) with postpartum anaemia and disseminated intravascular coagulation being the major predictors of maternal mortality.

Conclusion: The study showed that placental praevia and abruption placenta remain the major causes of antepartum haemorrhage causing both maternal and perinatal mortality. Prompt diagnosis and intervention would significantly reduce the mortality associated with antepartum haemorrhage.

INTRODUCTION

Antepartum haemorrhage is an important condition that complicates 2-5% of pregnancies,¹ it has important consequences for the obstetric patient and her fetus. The fetus is at risk of complications such as preterm delivery, low birth weight and increased perinatal mortality. It is an important cause of maternal mortality, prematurity and operative delivery. Clinically, the most important causes of antepartum haemorrhage is placental in origin, either from a placental praevia or abruption placenta. These conditions account for 53% of all reported episodes of vaginal bleeding in late pregnancy. Also clinically important, but rarer, is the loss of fetal blood from vasa praevia. A substantial proportion of bleeds are of indeterminate origin, although subsequent histological examination of the placenta may reveal marginal sinus rupture or evidence of sub clinical abruption. Local causes account for about 5% of antepartum haemorrhage and rarely make a significant impact on the outcome of pregnancy.¹

Abruptio placenta refers to separation of the normally located placenta after the 28th week of gestation and before the birth of the fetus². The

incidence of abruption placentae is about 1% of all pregnancies throughout the world,^{2,3} however, different studies have reported variable incidence of abruption placentae ranging from 0.3% to 2% of all term deliveries^{4,5}, while other studies reported incidence of 5.9 per 1000 births to 6.5 per 1000 births^{6,7}. The risk factors for abruption placentae implicated include hypertensive disorders of pregnancy, polyhydramnios, maternal trauma, preterm rupture of membranes (PROM), trauma etc.^{2,3}. Maternal complications associated with abruption include hemorrhagic shock, disseminated intravascular coagulation, renal failure, uterine apoplexy or couvelaire uterus leading to postpartum hemorrhage^{8,9}. Fetal complications include hypoxia, anaemia, growth restriction, prematurity, neurodevelopmental problems and fetal death^{2,10}.

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Placental Praevia is defined as a placenta that lies wholly or partially within the lower uterine segment. The prevalence of clinically evident placental praevia at term is estimated to be approximately 4 or 5 per 1000 pregnancies¹¹. Placenta praevia is classified into minor (types I & II anterior) and major degrees (Types II posterior, III & IV), this is important in making management decisions because the incidence of morbidity and mortality in the fetus and mother increases as the grade increases. Risk factors associated with the development of placenta praevia include increasing maternal parity, advance maternal age, multiple pregnancy, previous caesarean section and previous placental praevia.¹¹ Traditionally, caesarean section has been the recommended mode of delivery for major placenta praevia whereas for minor praevia an attempt at vaginal delivery is deemed appropriate.^{11,12} Complications associated with placenta praevia include shock, prematurity, perinatal and maternal deaths.

This comparative study between abruption placenta and placenta praevia was embarked upon to compare the maternal and fetal outcome of patients who presented with antepartum haemorrhage due to abruption and praevia and to identify the possible risk factors associated with them. The review of cases that have been managed would highlight our lapses which can be improved upon to better the management of these patients in future and the report of these reviews could also be used by policy makers.

MATERIALS AND METHODS

It was a retrospective comparative study of 10 years duration at the University College Hospital, Ibadan. The hospital is a tertiary/teaching Hospital located in the capital city of Oyo State, Ibadan South West of Nigeria. It is the main referral centre in the State and serves a population of over 7million people.

The case notes of patients who had antepartum haemorrhage between January 1997 to December 2006 were retrieved and relevant information obtained from their case notes. Data were collected for maternal age, parity, Gestational Age, booking status, pre and post operative haemoglobin, mode of delivery, amount of blood transfused, previous bleeding episodes, associated risk factors, maternal and fetal outcome. The data collected was entered into the SPSS window version 15 and it was analyzed by an SPSS Data

processor. Pearson correlation was used to test for significance and P value <0.05 was taken as significant.

RESULTS

During the 10-year period there were a total of 11,815 deliveries out of which 385 (3.25%) had antepartum haemorrhage. Two hundred and ninety-nine (2.5%) had placental praevia or abruption as the cause of their antepartum haemorrhage while the rest were due to incidental causes and these were cancer of the cervix and cervicitis. The 299 who had praevia and abruption were analyzed for the purpose of this study and a total of 182 (1.5%) had praevia while 117 (1%) had abruption.

Table 1: shows the demographic characteristics of the patients in the study with the median age being 30 years (range 15-44years). The other parameters are as shown in the table.

Table 2: showed that early warning bleeding occurred in 96.4% of those with praevia while it occurred in 3.6% of those with abruption, this was statistically significant. About 57% of those who presented with profuse bleeding had abruption while 43% were due to praevia. Out of the 29 patients who presented with circulatory shock 13 (44.8%) was due to abruption while 16 (55.2%) was due to praevia. Also 67.5% of those with abruption presented with intrauterine fetal death as against 32.5% of those with praevia, this was also statistically significant.

Table 3: showed that none of the patients who presented with abruption was conservatively managed while 13 of those who had praevia had expectant management and consequently had elective caesarean section at term. About 16% of those with abruption had emergency caesarean section while 84% of those with praevia had emergency caesarean section. About 90% of the patients with abruption had spontaneous vaginal delivery while 10% of those with praevia had spontaneous vaginal delivery. These were statistically significant.

About 46% of the patients who had abruption were transfused with blood ranging from 1-4 pints while 53.8% of those who had praevia had massive blood transfusion (4-6pints). This was not statistically significant.

Table 4: showed the postpartum complications which occurred among the patients in the study, the anaemia was mainly due to postpartum haemorrhage. The table also showed

that there is no significant difference in the incidence of the complications except in those with abdominal wound sepsis in patients with praevia where $P < 0.05$ on chi-square, and this was probably due to the increase rate of caesarean section in the praevia group.

Table 5 showed that 48.5% of the patients with abruption had babies weighing $< 2.5\text{kg}$ while 51.5% of the patients with praevia had babies who weighed $< 2.5\text{kg}$. About 29% of those with abruption had babies who weighed $> 2.5\text{kg}$ while 70.6% of those with praevia had babies who weighed $> 2.5\text{kg}$. This was statistically significant, $P < 0.05$. Also, fifteen (16.7%) of the patients with abruption and 75 (83.3%) of those with praevia had apgar score of 7 and above at 5 minutes of life. This was statistically significant $P < 0.05$, while asphyxia was reported in the two groups. Of the patients who had abruption, 56% had preterm deliveries while 44% of the praevia had preterm deliveries. This was not statistically significant. Perinatal mortality occurred in 62.1% of those with abruption while for those with praevia 37.9% had perinatal mortality. This was statistically significant ($P = 0.000$).

Table 6 showed the risk factors that were identified to be associated with antepartum haemorrhage in the study: Of the patients that had pregnancy induced hypertension/pre-eclampsia 82.9% were found to have abruption while 17.1% had praevia, this was statistically significant ($P < 0.05$). Of those that had multiple gestation 72.7% had abruption while 27.3% had praevia, among the grand multiparous women 52% had abruption while 48% had praevia, this was not statistically significant. Among the patients with previous caesarean section 13.9% had abruption while 86.1% had praevia, this was statistically significant ($P < 0.001$). Of those with previous history of placenta praevia 25% had abruption while 75% had a repeat praevia. This was not statistically significant.

Table 7 summarizes the maternal characteristics and the postpartum complications which were significantly associated with maternal mortality on bivariate analysis using pearson's correlation coefficient and this included booking status, severe bleeding with heavy clots at presentation, postpartum anaemia, disseminated intravascular coagulation, and previous caesarean section. However, when the characteristics associated with the maternal mortality on bivariate

analysis were subjected to multiple logistic regression to control for possible confounding variables such as age, parity, and occupation only postpartum anaemia and disseminated intravascular coagulation were found to be significant predictors of maternal mortality.

TABLE 1: BIOPHYSICAL CHARACTERISTICS OF THE PATIENTS WITH PRAEVIA AND ABRUPTION IN THE STUDY.

Characteristics	Praevia	Abruption
Age (median)	30	30
Parity (median)	1	2
Marital status:		
Married	179 (60.7%)	16 (39.3%)
Single	3 (7.5%)	1 (2.5%)
Booking status: Booked	50 (73.5%)	18 (26.5%)
Unbooked	132 (57.1%)	99 (42.9%)
GA (mean) on admission	36Wks	35Wks
Religion: Christian	107 (63.3%)	62 (36.7%)
Islam	75 (57.7%)	55 (42.3%)
Tribes		
Yoruba	163 (61.3%)	103 (38.7%)
Igbo	5 (45.5%)	6 (54.5%)
Hausa	9 (64.3%)	5 (35.7%)
Others	5 (62.5%)	3 (37.5%)
Occupation:		
Professionals	33 (57.9%)	24 (42.1%)
Traders	122 (75.8%)	39 (24.2%)
Artisans	11 (26.8%)	32 (73.2%)
Housewives	14 (53.8%)	12 (46.2%)
Students	2 (16.7%)	10 (83.3%)

Table 2: CLINICAL PRESENTATION

Clinical Presentation	Abruptio	Praevia
Early warning bleeding	2 (3.6%)	53 (96.4%) *
Profuse bleeding with heavy clots	38 (56.7%)	29 (43.3%)
Circulatory Shock	13 (44.8%)	16 (55.2%)
Intrauterine fetal death	79 (67.5%)	38 (32.5%) *

* $P < 0.05$

TABLE 3: MODE OF MANAGEMENT OF THE PATIENTS

Management	Abruptio	Praevia
Conservative	0	13
Emergency caesarean section	31(16.3%)	159 (83.7%) *
Spontaneous vaginal delivery	86 (89.6%)	10 (10.4%) *
Transfusion	66 (46.2%)	(53.8%)

* P<0.05

TABLE 4: PERCENTAGE OF PATIENTS WITH POST PARTUM COMPLICATIONS

Maternal complications	Abruptio	Praevia
Anaemia	73 (47.1%)	82 (52.9%)
Deaths	4 (50%)	4 (50%)
Wound sepsis	2 (28.6%)	5 (71.4%) *
Disseminated intravascular coagulation	18(51.4%)	17(48.6%)

*P<0.05

TABLE 5 : FETAL OUTCOME IN EACH GROUP OF THE PATIENTS

Fetal outcome	Abruptio	Praevia
Birth wt <2.5kg	49(48.5%)	52(51.5%)
>2.5kg	50 (29.4%)	120((70.6%)*
Apgar score 7	15 (16.7%)	75 (83.3%)*
Asphyxia-Apgarscore 6		
- Severe 3	10(41.7%)	14 (58.3%)
- Moderate 4-5	13 (35.1%)	24 (64.9%)
- Mild - 6	10 (24.4%)	31 (75.6%)
Prematurity	28 (56%)	22 (44%)
Intrauterine fetal death	79 (67.5%)	38 (32.5%) *

*P<0.05

TABLE 6: RISK FACTORS IDENTIFIED TO BE ASSOCIATED WITH THE APH

Risk Factors	Abruptio	Praevia
PIH / Preeclampsia	29 (82.9%)	6 (17.1 %) *
Grand multi parity	13 (52%)	12 (48%)
Multiple gestation	8 (72.7%)	3 (27.3%)
Previous C/S	5 (13.9%)	31 (86.1%) *
Previous Placenta Praevia	1 (25%)	3 (75%)

*P<0.05

TABLE 7 : MATERNAL CHARACTERISTICS / POSTPARTUM COMPLICATIONS SIGNIFICANTLY ASSOCIATED WITH MATERNAL MORTALITY ON PEARSON'S CORRELATION USING BIVARIATE ANALYSIS:

Maternal characteristics/post partum complications	Maternal mortality	r	P value
Booking status	1	0.206	0.006
Severe bleeding with heavy clots	1	0.231	0.002
Anaemia	1	0.438	0.000
Disseminated intravascular coagulation	1	0.41	0.000
Previous caesarean section	1	0.253	0.042

DISCUSSION

The median gestational age for the infants born in the abruption placenta patients was one week gestational age less than for the infants born in the placenta praevia patients (35 weeks versus 36 weeks) accounting for 56.0% of prematurity in the abruption placenta patients and 44.0% of the placenta praevia patients, this is in agreement with the study of Yoshio Matsuda in 2003,¹³ that prematurity is more associated with abruption. The patient with abruption presented with profuse bleeding (58.7% vs 43.3%) and intrauterine fetal deaths (67.5% vs 32.5%) than those with placenta praevia which could have been due to the fact that many of them had total separation of the placenta resulting in hypoxia and subsequent fetal death and this is in agreement with other studies.^{13,15}

None of the patients who had abruption was conservatively managed as against those with praevia, this is because most of the patients presented with major abruption and fetal compromise and a fulminant maternal disseminated intravascular coagulation can occur within hours of a complete abruption and delivery was therefore effected as the only means to halt this, this also has been advocated by other researchers¹¹ as the line of management of abruption. However, the patients with praevia who were conservatively managed actually presented with non-life threatening haemorrhage at a lower gestational age and were managed expectantly to term when delivery was effected.

Most of the patients with abruption had spontaneous vaginal delivery (89.6%) as against those who had praevia (10.4%), this is because in abruption placenta the seeping of blood into the

myometrium causes irritation of the myometrium which initiates uterine contractions and this has been advocated to occur in 50% of patients with abruption¹. Also because most of them presented with intrauterine fetal death (67.5%) vaginal delivery was preferable to avoid unnecessary scar on the uterus while spontaneous vaginal delivery was achieved only in those with minor placenta praevia. The study also showed that most of the patients who had praevia had emergency caesarean section (83.7%) as against those with abruptio (16.3%). This is also in line with the fact that caesarean section is the mode of delivery for major placenta praevia while caesarean section is performed in patients with abruption who presents with live fetus where a vaginal delivery could not be effected within a short time to prevent intrauterine fetal death

Postpartum anaemia was commoner in the patients with placenta praevia (52.9%) as against those with abruption (47.1%) and more of the patients with praevia had blood transfusion (53.8%) compared with those with abruption (46.2%) the anaemia had probably resulted from the recurrent bleeding which is characteristic of placenta praevia coupled with the postpartum haemorrhage. This further buttresses the fact that any form of anaemia in the antenatal period should be corrected and the postpartum haemorrhage associated with this condition should be prevented by the use of oxytocics and provision be made for immediate transfusion if haemorrhage occurs.

Wound sepsis occurred more in those with praevia (71.4% vs 28.6%) because most of those with praevia had caesarean sections as against spontaneous vaginal delivery which is less associated with maternal morbidity. Disseminated intravascular coagulation occurred more in those with abruption (51.4%) as against praevia (48.6%) this is because placenta abruption usually involves the liberation of tissue thromboplastin or possible intrauterine consumption of fibrinogen and coagulation factors during the formation of retroplacental clot thus leading to the activation of the extrinsic coagulation mechanism.¹⁴ Maternal mortality was low but the same in both abruption and placenta praevia, this was probably due to prompt intervention in the management of both cases especially because of the presence of expertise in tertiary health center like ours unlike in a primary health care centre.

The birth weights of newborns showed a

tendency towards lower weight in those with praevia compared to those with abruption (51.5% vs 48.5%) this could be attributed to the maternal anaemia from the recurrent bleeding in praevia. The babies of those with praevia had good apgar score than those with abruption (83.3% v 16.7%) and perinatal mortality was also found to be higher in those with abruption placenta 62.1% vs 37.9% this could be explained by the fact that majority of the patients had total placenta separation with a resultant hypoxia and subsequent fetal death which is also in keeping with the work of other researchers.^{10,13,15,16}

The study also showed that pregnancy induced hypertension or pre-eclampsia is more associated with an increased risk of abruption than praevia (82.9% vs 17.1%) and this is in keeping with other studies, Abdella et al¹⁷ who also noted in a study of 265 cases of abruption that the incidence of abruption was highest with eclampsia; this was also statistically significant when it was subjected to logistic regression, $P < 0.05$, (C.I 0.003-1.034). Grand multiparity was also identified to be more associated with abruption than praevia (52% vs 48%), this is in keeping with other studies where increased parity was noted to play a role in the aetiology of placenta abruption.^{18,19} Although multiple gestation is a known risk factor associated with placenta praevia, it was not found to be associated with praevia in this study (27.3% as against 72.7% in those with abruption), this could be due to the fact that some of these patients with multiple gestation also had pregnancy induced hypertension and they were also multiparous and these were more related with abruption in this study.

However, previous caesarean section was found to be significantly associated with placenta praevia, $P < 0.005$ and this is in keeping with the studies of Archibong, To, and Taylor^{20,21,22} who posited that uterine scar in the lower segment may attract a low implantation of the placenta. Also women with previous antepartum haemorrhage due to placenta praevia were found to have a higher chance of a recurrence of the praevia (75% vs 25%) this is probably due to the fact that the factors which caused the attraction of a low implantation of the placenta were still present. Maternal mortality on bivariate analysis using Pearson's correlation coefficient showed a significant correlation with booking status, severe bleeding with heavy clots at presentation, previous caesarean section, anaemia and disseminated intravascular coagulation, however on multiple logistic regression after

confounding for age, parity and occupation, post partum anaemia and disseminated intravascular coagulation were found to be significant predictors of maternal mortality.

CONCLUSION

Bleeding from placental praevia and abruption placenta are the leading causes of antepartum haemorrhage in this centre causing both maternal and perinatal mortality with abruption being more associated with perinatal deaths. Also with postpartum anaemia and disseminated intravascular coagulation being significant predictors of maternal mortality, efforts should be made at preventing anaemia during the antenatal care by way of blood transfusion, routine haematinics, and malaria prophylaxis since any episode of bleeding in pregnancy could further compromise maternal and fetal outcome. Disseminated intravascular coagulation should be prevented by quick intervention when bleeding occurs with the involvement of expertise like the haematologist in order to reduce the mortality associated with it. Continuous review of cases which have been managed should be encouraged and useful suggestions made on how to improve the management of those who would present with similar bleeding in future.

REFERENCES

1. K. Morgan and S. Arulkumaran: Antepartum haemorrhage. Available online at www.sciencedirect.com 2003.
2. Gaufberg SV. Abruption placenta. Online Webpage Cited 2003 Jul 15. Available from URL: <http://www.emedicine.com/emerg/topic12.htm>.
3. Toivonen S, Anttilä M, Kosma VM, Säälik R, Rikosi S. Reproductive risk factors, Doppler findings, and outcome of affected births in placental abruption. *Am J perinatal* 2002; 19 (8): 451 – 60.
4. Sheiner E, Shoham – Varchi I, Hallak M, Hadar A, Gortzak – Uzan L, Katz M et al. Placental abruption in term pregnancies: Clinical significance and obstetric risk factors. *J Matern Fetal neonatal med* 2003; 13 (1): 45-9.
5. Sharief M, Manthar AA. Abruption placenta; perinatal outcome in normotensive and hypertensive patients in Basra, Iraq (Seral online) 1998, *emhj*; 4 (2) 319 - 23. Available from URL: <http://www.emro.who.int/publications/EMHJ/0402/16.htm>
6. Abu-Heiji A al Chalabi H, el Iloubani N Abruption placenta: risk factors and perinatal outcome. *J. obstet Gynaecol Res* 1998; 24 (2): 141-4
7. Krohn M, Voight L, McKnight B, Daling JR, Syszyk P, Benedetti TJ, . Correlates of Placental abruption. *Br J Obstet Gynaecol* 1987; 94 (4): 333-40
8. Obstetrical haemorrhage (Chap 32). In: Cunningham FG, MacDonald PC, Gant NF, Leveno KJ, Gilstar III LC, Hankins GDV, Clark SL, editors. *Williams obstetrics* 20th ed USA: Appleton & Lange; 1997, P 746 – 55.
9. Hubbard JL, Hosmer SB. USA. Conveloire uterine. *J Am osteopath Assoc* 1997; 97 (9): 536 – 7.
10. Ananth CV, Berkowitz GS, Savitz DA, Lapinski RH. Placental abruption and adverse perinatal outcomes. *J Clin Epidemiol* 1999; 52 (5): 453 – 61.
11. Nicholas Ngeh and Amamath Bhide, Fetal medicine Unit, Dept, of Obstetrics and Gynaecology 4th Floor, lanes borough Wing, St George's Hospital, Blackshaw Road, SW 170QT, London, UK. April 2006.
12. Placental Praevia: Diagnosis and Management clinical green Top guidelines, Royal College of obstetrics and Gynaecologists Guidelines No 27. January 2000.
13. Naeye RL, Harkness WL, Utts J. Abruption placenta and perinatal death: a prospective study. *Am J obstet Gynaecol* 1997; 128 (7): 740-6.
14. Johana Weiss, MD, & Ramada S. Smith, MD, Critical Care Obstetrics in Current Obstetrics & Gynaecology chapter 58, Page 1060, 9th Edition, 2003.
15. Rai L, Duvvi H, Rao UR, Vaidehi, Nalinii V. severe abruption placenta – still unpreventable. *Int J Gynaecol obstet* 1989; 29 (2): 117-20.
16. Konje JC, Taylor DJ bleeding in Late Pregnancy (Chap 8) In: James DK, Steer PJ, Weine CP Gonikc B editors. *High Risk Pregnancy management options* 2nd Ed USA: WB Saunders; 1999. P 111-28
17. Abdella TN, Sibai BM, Hays JM Jr Anderson GD. Relationship of hypertensive disease to abruption placenta *Obstet Gynaecol* 1984; 63 (3): 365 – 70.
18. Hibbard BM, Hibbard ED; Aetiological factors in abruption placenta. Part I: *Epidemiology BMJ* 2: 1430, 1963.
19. Paterson MEL: The aetiology and outcome of abruption placenta. *Acta Obstet Gynaecol Scand* 58: 31, 1979.
20. Archibong EI, Ahmed EM, Risk factors maternal and neonatal outcome in major placenta praevia: A prospective study. *Ann Saudi Med* 1999; 16 (4): 12-16.
21. To WW, Leung WC. Placenta praevia and previous caesarean section. *Int J Gynaecol Obstet* 1995; 51: 25-31
22. Taylor ES. Editorial Comments. *Obstet Gynaecol Surv* 1983; 38:96.