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Placenta Abruptio: A Dreaded Obstetrical Entity in the South West Region of Cameroon. A retrospective Study

Le Placenta abruptio, une entité obstétricale redoutée dans la région du Sud-Ouest du Cameroun. Une étude rétrospective

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Key Words: Placental abruption, risk factors, complications, maternal, perinatal, Cameroon.

ABSTRACT

Background. Placental abruption (PA) is one of the leading causes of perinatal morbidity and mortality especially in the low and middle income countries. However, there is a paucity of data on the causes and complications of PA in the South West region, Cameroon. **Objectives.** To determine the causes and obstetric complications of PA in the Buea and Limbe Regional Hospitals. **Methods.** A hospital-based retrospective cohort study was carried out at aforementioned Hospitals. Data was collected from case notes of pregnant women from January 1, 2009 to December 31, 2018. Medical records of cases were matched for age and parity with controls in the ratio of 1:2. The Chi square and Fischer's exact test were used to compare categorical variables and modeled into multivariate analysis. A p-value < 0.05 was considered statistically significant. **Results:** The prevalence of PA was 0.22%. The causes of placental abruption were : abdominal trauma (ORa 3.1; p<0.001), chronic hypertension (ORa 2.4; p=0.03), and premature rupture of membranes (ORa 2.4;p<0.001). Maternal complications independently associated with PA were : PPH (ORa 1.4;p<0.001), hypovolemic shock (ORa 3.7;p=0.007), need for blood transfusion (ORa 3.4; p=0.001), clinical anemia (ORa 3.9; p<0.001), and acute kidney injury (ORa 2.3;p=0.008). Fetal complications were : fetal distress (ORa 1.7; p=0.03), birth asphyxia (ORa 2.0; p<0.001), stillbirth (ORa1.5; p=0.001), and early neonatal death (ORa 4.3; p<0.001). **Conclusion.** This study revealed that prevalence of PA was low. However, it was associated with significant maternal-fetal morbidity and mortality, hence need for timely and proper management.

RÉSUMÉ

Introduction. L'hématome retro placentaire (HRP) est l'une des principales causes de morbidité et de mortalité périnatale dans le tiers monde. Ses causes et ses complications n'ont pas été décrites dans la région sud-ouest du Cameroun. **Objectif :** Déterminer les causes et complications materno-fœtales associées aux HRP dans les hôpitaux régionaux de Buea et de Limbe. **Méthodes.** Étude de cohorte rétrospective à partir des dossiers hospitaliers des femmes enceintes du 1er janvier 2009 au 31 décembre 2018. Les cas ont été appariés en fonction de l'âge et la parité avec les témoins (rapport de 1: 2). Les tests de Khi carré et exact de Fisher ont été utilisés pour comparer des variables catégorielles et modélisés dans une analyse multivariée. **Résultats**. La prévalence de l'HRP était de 0,22 %. Les causes d'HRP étaient : traumatisme abdominal (ORa 3.1; p<0.001)), hypertension chronique (ORa 2.4; 95%; p=0.03), et la rupture prématurée des membranes (ORa 2.4; p<0.001). Les conséquences maternelles indépendamment associées à l'HRP étaient : Hémorragie du postpartum (ORa 1.4; p<0.001), le choc hypovolémique (ORa 3.7; p=0.007), la transfusion sanguine (ORa 3.4; p=0.001), l'anémie clinique (ORa 3.9; p<0.001), et l'insuffisance rénale aigu (ORa 2.3; p=0.008). Les complications fœtales étaient : la souffrance fœtale aigue (ORa 1.7; p=0.03), l'asphyxie néonatale (ORa 2.0; p<0.001), le taux de Mort-nés (ORa 1.5; p=0.001) et la mortalité néonatale précoce (ORa 4.3; 95% p<0.001). **Conclusion.** Cette étude a révélé que la prévalence de l'HRP était faible. Cependant, il était associé à une morbidité et une mortalité materno-fœtales importantes, d'où la nécessité d'une prise en charge rapide et appropriée.

INTRODUCTION

Placental abruption is the premature separation of the normally implanted placenta from the uterine wall leading to bleeding between the uterine wall and the placenta. It occurs after the age of viability and prior to birth [1]. It complicates 0.4-1% of all pregnancies worldwide [2,3]. PA is reported to be more prevalent in the black race[4]. The highest prevalence was detected in Asia (12.2 per 1000 pregnancies), and a lower prevalence was reported in Europe (3.6 per 1000 pregnancies), North America (2.9 per 1000 pregnancies)

and Sub-Saharan Africa (2.7 per 1000 pregnancies)[5]. Hemorrhage contributes 24.5% of maternal death in Sub-Saharan Africa[6]. In a teaching hospital in Yaounde, Cameroon, placental abruption was associated with 73% of antepartum hemorrhage and it had a prevalence of 0.32% [7]. PA poses multiple risks for both mother and fetus. The World Health Organization estimates showed maternal mortality rates due to PA worldwide was 2.1% and perinatal mortality rate was 15% [8] with neonatal prognosis dependent on the percentage of placental detachment [9]. Placental abruption is rare but the incidence is rising [10], and there is limited data about the causes and complications in the South West region of Cameroon hence the necessity of this study. The high incidence in low and middle income countries is accounted for the low socioeconomic conditions, grand multiparity, ignorance about antenatal care, and poor diagnosis and control of predisposing and precipitating factors of PA [7]. The goal of this study was to determine the causes, maternal and fetal complications of PA at the Buea and Limbe Regional Hospitals from January 1, 2009 to December 31, 2018.

MATERIALS AND METHODS

We carried out a 10-year hospital-based retrospective study at the Buea and Limbe Regional Hospitals from January 1, 2009 to December 31, 2018. Data were collected from case notes of patients who gave birth during this period. Medical records of pregnant women diagnosed with PA after 28 weeks gestation (cases) were matched for age, and parity with those without PA (controls) in the ratio 1:2. The diagnosis of PA was gotten from 3rd trimester ultrasounds or as an intraoperative finding from post-operative notes or from retroplacental hematomas following vagina deliveries. We excluded medical records with incomplete or inappropriate data, other causes of antepartum bleeding, and obstetrical hemorrhage before 28 weeks of gestation. Data collection was done using a pre-tested data extraction form. Ethical clearance was obtained from the Institutional Review Board of the Faculty of Health Sciences, University of Buea, and administrative authorization from the Regional Delegation of Public Health for the SWR [11]. The recorded data was processed using the MS Excel 2013 and analyzed using the SPSS 23. The Chi square and Fisher's exact test were used to compare categorical variables. A p-value ≤0.05 was considered statistically significant.

RESULTS

During the period of our study (from January 1, 2009 to December 31, 2018), we recorded 20812 deliveries and 42 cases of PA, a prevalence of 0.22% (42/20812).

Sociodemographic and obstetric characteristics of placental abruption

The average age of patients with PA was 27years ± 5years (range: 16-39). PA was common among married women (p=0.002). History of previous PA and poor ANC (<8 visits) were associated with PA (p=0.003, p<0.001 respectively) (Table I)

Causes of placental abruption

Bivariate Logistic regression analysis was used to identify causes associated with PA. The potential causes that showed to be statistically significant were; abdominal trauma (OR3.2; 95% CI: 1.2-5.3; p<0.001), maternal hypertension (OR 2.5; 95% CI: 1.3-4.9; p<0.001); specifically, chronic hypertension (OR 2.2; 95% CI:1.5-4.2; p=0.03), and premature rupture of membranes(PROM) (OR 2.5; 95% CI: 1.3-4.9; p<0.001) (Table II)

Table I: Sociodemographic and obstetric characteristics of the study population

Variables	Category	Cases =42	Control =84	p-value
		N (%)	N (%)	
Sociodemographic characteristics				
Age [M±SD (26.9±5.2)]	<20	5 (11.9)	10 (11.9)	
	20-29	25 (59.5)	52 (61.9)	0.92
	30-39	12 (28.6)	22 (26.2)	
Marital status	Single	11(26.2)	36 (42.9)	0.003
	Married	31 (70.8)	48 (57.1)	
Occupation	Student	12 (28.6)	17 (20.2)	
	Business	4 (9.5)	18 (21.4)	0.27
	Farmer	3 (7.1)	3 (3.6)	
	Others	23 (54.8)	46 (54.8)	
Obstetric characteristics				
Parity	0	14 (33.3)	29 (34.6)	
	1	8 (19.1)	16(19.0)	0.995
	2-4	20 (47.6)	39 (46.4)	
Number of ANC	0	11 (26.2)	3(3.6)	
	1-7	31(73.8)	80(95.2)	<0.001
	≥8	0 (0.0)	1(1.2)	
History of previous PA	No	38(90.5)	84(100)	
	Yes	4(9.5)	0(0.0)	0.03

COR: Crude Odd Ratio, CI: Confidence Interval, N=frequency, NA: Not Applicable, ANC: Antenatal Care

Complications of placental abruption

There were significant associations between PA and the following maternal complications namely : clinical anemia (OR 4.2; 95% CI: 1.2-6.2; p<0.001), blood transfusion (OR 4.9; 95% CI: 1.7-8.1; p=0.001), PPH (OR 1.4; 95% CI: 1.1-4.2; p<0.001), hypovolemic shock (OR 4.1; 95% CI: 2.1- 6.2; p=0.007) and acute kidney injury (OR 3.1; 95% CI: 1.1-6.2; p=0.008) (Table III)

PA was associated with the following fetal complications : birth asphyxia (OR 2.1; 95% CI: 1.2-4.1; p<0.001), low Apgar score (OR 2.5; 95% CI: 1.1-4.2; p=0.04), early neonatal death (OR 4.8; 95% CI: 1.9–9.3; p<0.001), stillbirth (OR 1.5; 95% CI: 1.1-2.7; p=0.001), perinatal death (OR 1.5; 95% CI: 1.1-2.8; p=0.04) and fetal distress (OR 1.8; 95% CI: 1.2–3.1; p=0.03). After multivariate analysis of significant variables, low Apgar score and perinatal death were found to be confounders (Table IV)

DISCUSSION

Prevalence of placental abruption

The prevalence of PA in this study was 0.22%. This was slightly lower than 0.32% in Yaounde teaching hospital [7] and 0.30% in Tanzania [12]. This disparity may be explained by difference in studied population, sampling procedures and diagnostic criteria. Also, the low prevalence of PA could be explained by early detection and management of modifiable risk factors. Furthermore, there is a risk of mild abruption being misdiagnosed or ignored. Hence probable underestimation of the prevalence of PA.

Sociodemographic and obstetric characteristics of placental abruption

The mean age of patients with PA was 27 years old. This was similar to 28 years by other studies [1,7,13]. Poor ANC below the 2016 WHO ANC model of 8 contacts was associated with PA. This could be explained by late or lack of diagnosis and management of controllable risk factors of PA such as hypertension. This study also showed that previous occurrence of PA, influenced its occurrence in subsequent pregnancies. This was similar to studies done in Sweden [14], Tanzania [12] and Iran [15].

Causes of placental abruption

Our study showed an association between chronic hypertension and PA with patients with chronic hypertension having 2.5 times increased risk of PA. This was similar to 2.4times in Finland [10].

Just like our study, recent studies have shown an association between abdominal trauma [16,17] and PROM [16,17] with PA. Two mechanisms may account for this link between PROM and PA: induction of PA by abrupt uterus retraction and decompression during preterm PROM[18]

Complications of placental abruption

Our study showed that a majority of cases had non-instrumental vagina delivery(54.8%) compared to caesarean section(42.9%). Instrumental vagina delivery was less likely(2.3%). This was similar to a study done in Nigeria(56%) [3].However, some other studies indicated a larger proportion of patients having caesarian section [7,10,13]. The reason for disparity in mode of management may be due to status of the fetus at the time of presentation, the degree of advancement of labour and the time of diagnosis [13]. Postpartum hemorrhage (PPH) was associated with PA, as seen in other studies [3,12].

Table II: Causes of placental abruption

	Cases n=42	Controls n=84	Bivariate Logistic regression		Multivariate Logistic regression	
Potential cause	N (%)	N (%)	COR (95% CI)	p-Value	ORa (95%CI)	p-value
Abdominal trauma						
No	35(83.3)	82(97.6)	1		1	
Yes	7(16.7)	2(2.4)	3.2(1.2-5.32)	<0.001	3.1(1.1-4.9)	0.002
Maternal hypertension						
No	22(52.4)	74(88.1)	1		1	
Yes	20(47.6)	10(11.9)	2.5(1.3-4.9)	<0.001	2.4(1.2-5.1)	0.002
Type of hypertension						
Pre-eclampsia	16(38.1)	10(11.9)	1			
Gestational hypertension	2(4.8)	0(0.0)	2.1(0.2-3.2)	0.53		
Chronic hypertension	1(2.3)	0(0.0)	2.2(1.5-4.2)	0.03	2.4(1.5-4.2)	0.04
Pre-eclampsia superimposed with chronic HP	1(2.3)	0(0.0)	2.1(1.4-3.9)	0.62		
Multiple pregnancies						
No	39(92.9)	77(91.7)	1			
Yes	3(7.1)	7(8.3)	0.8(0.4-1.8)	0.67		
PROM						
No	30(71.4)	70(83.3)	1		1	

Yes	12(28.6)	14(16.7)	2.5(1.4-3.1)	0.02	2.4(1.3-3.9)	0.024

COR: Crude Odd Ratio, ORa: Adjusted Odd Ratio, CI: Confidence Interval, n=frequency, NA: Not applicable

Table III: Maternal complications of placental abruption

	Cases (n=42)	**Controls (n=84)**	**Bivariate analysis**		**Multivariate analysis**	
Maternal complications	N (%)	N (%)	COR (95% CI)	*p*-value	ORa (95% CI)	p-value
Mode of delivery						
Caesarian section	18 (42.9)	22 (25.9)				
Vaginal delivery non instrumental	23 (54.8)	62(74.1)	NA	NA	NA	NA
Instrumental vaginal delivery	1(2.3)	0 (0.0)				
PPH						
Yes	3 (7.1)	9(10.6)	1.4(1.1-4.2)		1.4(1.3-4.4)	0.002
No	39(92.9)	75(89.4)	1	<0.001	1	
Clinical anemia						
Yes	24(57.1)	10(11.8)	4.2(1.2-6.2)		3.9(1.4-5.7)	0.04
No	18(62.9)	74(88.2)	1	<0.001	1	
Blood transfusion						
Yes	18 (42.9)	3(3.5)	4.9(1.7-8.1)	0.001	3.4(1.3-6.9)	<0.001
No	24 (57.1)	81(96.5)	1		1	
Unit transfused						
1	3(16.7)	1(33.3)				
2	14(77.8)	2(66.7)	NA	NA		
4	1(5.5)	0(0.0)				
Acute kidney injury						
Yes	3(7.1)	1(1.2)	3.1(1.1-6.2)		2.3(1.4-4.8)	
No	39 (92.9)	83(98.8)	1	0.008	1	0.004
Coagulopathy						
Yes	4(9.5)	0	1.2(0.8-3.2)		1.2(0.7-2.9)	0.99
No	38 (90.5)	84(100)	1	0.94	1	
Hypovolemic Shock						
Yes	8(23.5)	0	4.1(2.1-6.2)		3.7(1.6-7.2)	0.008
No	36(76.5)	84 (100)	1	0.007	1	
Maternal death						
Yes	0(0)	0(0.0)	NA	N A	NA	NA
No	42(100)	84(98.8)				

COR: Crude Odd Ratio, ORa: Adjusted Odd Ratio, CI: Confidence Interval, n=frequency. PPH: Postpartum Hemorrhage, NA: Not applicable

This is not surprising as both antepartum and PPH are part of the documented sequelae of PA. However, the low level PPH(7.1%) in this study compared to a study in Nigeria(61%)[3] could be explained by the low levels of coagulopathy(9.5%) or uterine atony. However, PPH due to uterine atony was not measured due to incomplete data. The frequent occurrence of maternal anemia has been noted in similar studies [3]. Clinical anemia may be due to the blood loss as a result of PA. Circulatory shock was also associated with PA as seen in other studies [8,16]. This could be explained by excessive blood loss due to PA. Similarly, hypovolemic shock and AKI were significantly associated with PA like other studies [8,16]. This is explained by hypovolemia which could cause acute tubular necrosis due to inadequate perfusion of the kidneys. Just like previous studies, blood transfusion was associated with PA [12]. This may be explained by hypovolemic shock and severe anemia due to antepartum or PPH**.** No maternal death was recorded in our study. This was in contrast with a study done in Tanzania which recorded 4 maternal deaths with a case fatality rate of 3.6% [12] and a study in Nigeria which recorded 2 maternal deaths with a case specific fatality rate of 4.1% [13] and another in Nigeria which recorded 1 maternal death with a case fatality rate of 2.8%[3] however similar to a study in France with no maternal deaths[18] . This discrepancy between studies could be explained by the differences in sample sizes, the unavailability of blood products for resuscitation in Tanzania [12] and late presentations of PPH with irreversible shock [3,12] probably due to coagulopathy or uterine atony in Nigeria.

In this study, fetal distress and Birth asphyxia were found to be associated with PA. It is the result of reduction of the uteroplacental perfusion impeading blood flow to the foetus leading to hypoxemia. Congruent to other studies [13,18], birth asphyxia was also associated with PA. The high rate of perinatal mortality (80.9%) is comparable to those reported from similar developing countries such as Pakistan (67.9%) and in Burkina Faso (88.6%) [1] but lower than a similar study done in Yaoundé- Cameroon (46%). The high stillbirth rate could due to the possible three delays as stated by the WHO including delay for the patient to decide to come to the facility at the onset of bleeding, delay to arrive the facility[7] and delay from the medical staff to identify risk factors during ANC or cause and to diagnose PA and implement adequate therapeutic mesures early enough to give a chance to the baby to survive **.**

Study limitations

Excluding files of participants with incomplete data could cause selection bias and hence affect our results. This was mitigated by meticulously exploiting data from the files that were available despite the difficulties encountered because records were not well archived.

Table IV: Fetal complications of placental abruption

	Cases (n=42)	Controls (n=84)	Bivariate analysis		Multivariate analysis	
Fetal complications	N (%)	N (%)	COR (95%CI)	*p*-value	ORa (95%CI)	p-value
Gestational age /weeks						
28-31	15 (35.7)	2(2.4)	4.1(0.3-8.1)		2.8(0.9-3.9)	
32-33	4 (9.5)	0(0)	1.6(0.2-6.8)	0.67	1.5(0.6-5.2)	0.77
34-36	13(31.0)	1(1.2)	2.7(1.6-4.2)		2.3(0.7-4.3)	
37-42	10(23.8)	81(96.4)	1			
Fetal distress						
Yes	16(38.1)	78(92.9)	1.8(1.2-3.1)	0.041	1.7(1.4-5.4)	0.03
No	26 (61.9)	6(7.1)	1		1	
Still birth						
Yes	25(59.5)	2(2.4)	1.5(1.1-2.7)	0.001	1.5(1.2-2.8)	<0.001
No	17(40.5)	82(97.6)	1		1	
Birth Asphyxia						
Yes	9(21.4)	0(0)	2.1(1.2-4.1)	0.001	2.0(1.1-4.2)	<0.001
No	33(78.6)	84(100)	1		1	
Apgar score						
0	23(54.8)	2(3.5)	2.5(1.1-4.2)		2.5(0.8-4.2)	
1-2	2(4.8)	0(0.0)	2.1(1.2-3.8)	0.04	2.0(0.7-3.1)	0.88
3-6	13(31.0)	2(2.4)	1.7(1.3-2.5)		1.8(0.8-3.3)	
7-10	4(9.5)	80(94.1)	1		1	
Birth weight						
<1000g	4(9.5)	3(3.5)				
1000g-1499g	2(4.8)	0(0.0)				
1500-2499	13(31.0)	2(2.4)	NA	NA	NA	NA
2500-3999	23(54.8)	79(94.1)				
≥4000g	0.00	0.00				
Early neonatal death						
Yes	9(21.4)	2(2.4)	4.8(1.9-9.3)	0.002	4.3(1.4-7.22)	<0.001
No	33(78.6)	82(97.6)	1		1	

COR: Crude Odd Ratio, ORa: Adjusted Odd Ratio, CI: Confidence Interval, n=frequency, NA: Not applicable

Furthermore, the relatively small sample size poses the risk of missing out some causes and difficulty in generalizing conclusion.

CONCLUSION

The prevalence of PA in the Buea and Limbe Regional Hospitals was 0.22%, similar to local and international studies. Abdominal trauma, PROM, chronic hypertension, low levels of ANC and history of previous PA were associated with PA. PA was associated with severe maternal and fetal complications. Clinicians should therefore, identify causes of PA during prenatal care and provide appropriate management

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AUTHORS' CONTRIBUTIONS

Halle-Ekane Gregory: Conceptualisation of study, content editing and proofreading of manuscript.
Catherine Binye Musi: Protocol writing, data collection of study and manuscript writing.
Simo Wambo Andre: Content editing and proofreading of manuscript.
Abeg Rogers: Content editing of protocol.
Mbu Robinson: Topic conception, content editing, proofreading of manuscript.
Felix Adolphe Elong: Proofreading of manuscript.
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CONFLICTS OF INTERESTS

The authors declare that they have no conflict of interest.

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