Original Article

Patterns, Predictors and Delays in Diagnosing Retained Placenta: Insights from a Tertiary Health Facility in Southern Nigeria

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ABSTRACT

Retained placenta is a cause of maternal morbidity and mortality in sub-Saharan Africa, and its subtypes, predictors and diagnostic delays are not adequately documented. We sought to determine the clinical subtypes, predisposing factors, and delays in diagnosing retained placenta in women treated at Delta State University Teaching Hospital (DELSUTH), Oghara. This study reviewed the cases of 21 women with retained placenta treated at the Obstetrics and Gynaecology department of DELSUTH from January 1st, 2011 to December 31st, 2020. Socio-demographic features, risk factors, types of retained placenta, and time to diagnosis were extracted from the patients' case files. Statistical analysis was done using Chi-square and logistic regression, with a significance level set at $p<0.05$. The mean age was 29.8 ± 5.4 years. Most patients were unbooked 15 (71.4%) and multiparous 11 (52.4%). Unbooked pregnancy 15 (71.4%), preterm delivery 10 (47.6%), and previous D&C 8 (38.1%) were common risk factors. The commonest subtype was trapped placenta 11 (52.4%) and the average diagnostic duration of retained placenta was 82.0 ± 36.9 minutes. High parity (AOR: 26.28, p=0.032) and previous D&C (AOR: 17.14, p=0.034) emerged as independent predictors. Retained placenta is more prevalent among unbooked patients and diagnostic delays for retained placenta are common. High parity and previous uterine procedures such as dilatation and curettage are important predictors of adherent placenta. To reduce associated complications, it is crucial to provide supervised antenatal care, identify risks, and enhance monitoring of labour.

Keywords: Adherent placenta, DELSUTH, Delay in diagnosis, Nigeria, Retained placenta, Risk factors, Trapped placenta

INTRODUCTION

An important measure of a country's development and a reflection of the effectiveness of its healthcare system, is the standard of maternal health in that country.[1-3] In developing nations, pregnancy and delivery- related issues continue to pose great challenges, despite global efforts to reduce maternal morbidity and death. [4-7] One of such delivery-related problems encountered by parturient is retained placenta, and it is a preventable cause of bleeding following vaginal delivery, which can ultimately lead to maternal mortality across the world. [8]

Many studies and guidelines consider retained placenta to be the inability to expel the placenta from the uterus within 30 minutes after the delivery of the baby, particularly when accompanied by vaginal bleeding. [9-12] Nonetheless, to date, there is no global

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agreement on the specific duration for the placenta to be delivered before it is classified as retained, A study by Deneux-Tharaux involving 14 European countries showed wide variations in the waiting time prior to manual placental removal. In Finland and Denmark, obstetricians waited 60 minutes or more before removal of the placenta, while in Spain and France, the placenta was removed after a 30-minute wait. [13]

Normal placenta delivery requires sufficient uterine contractions, which facilitate the separation of the placenta and decidua from the uterine wall, and expulsion of the placenta tissue. Uterine atony, abnormal adherence of the placenta to the uterine wall or the cervix closing before the placenta is expelled are the possible reasons for the occurrence of retained placenta. [9, 14] Based on these mechanisms of aetiology, retained placenta can be classified into three subtypes, which include trapped placenta (where the placenta detaches but is retained due to a closed cervix); adherent placenta (where incomplete separation occurs because of abnormal adherence to the uterine wall) and the placenta accreta spectrum (which refers to various forms of abnormal placental invasion, including accreta, increta, and percreta). [9,14]

Retained placenta complicates about 0.5–4.8% of all vaginal deliveries worldwide, with variations across countries and health facilities. [14- 16.] In more affluent countries, the incidence of retained placenta is typically higher than in low- and middle-income nations. [17, 18] Notably, the median rate of retained placenta at 30 minutes after delivery is higher in developed countries in comparison to low-income ones. This discrepancy may have been caused by differences in the definitions of retained placenta, varied diagnostic criteria, and more proactive management procedures. [17,18]

Researchers have linked some risk factors to the occurrence of retained placenta after vaginal delivery and the evaluated factors include advanced maternal age, high parity, previous uterine dilation and curettage, previous caesarean section, previous myomectomy, preterm delivery, labour induction, premature rupture of membranes (PROM), abnormally adherent placenta, and hypertensive disorders. [9, 10, 14, 16, 19, 20] Nevertheless, retained placenta continues to be an obstetric challenge that is difficult to predict, highlighting the necessity for additional studies.

Sub-Saharan Africa countries face significant delays in recognizing and treating women with retained placenta as well as its attendant maternal morbidities such as PPH and anaemia. These delays are due to the high rate of unbooked pregnancies, unsupervised labour, and deliveries conducted by unskilled birth attendants. [16, 21] These challenges are worsened by inadequate monitoring during the third stage of labour or lack of access to emergency theatres and blood transfusion services. [16,21,22]

A major gap in the current literature is the absence of local data concerning the particular risk factors associated with different subtypes and the delay in diagnosis related to retained placenta. Understanding the differences between types of retained placenta is crucial. A trapped placenta might respond to conservative measures such as uterine massage or gentle cord traction, for example. Adherent or accreta placenta, however, often demands more invasive interventions like manual removal or obstetric hysterectomy. Therefore, timely differentiation and appropriate triage can prevent complications and enhance maternal outcomes. Beyond that, recognizing how socio-demographic and obstetric factors influence risk helps support better risk stratification during antenatal care

This study was conceptualized to identify the subtypes, predictors, and delays in diagnosis of retained placenta at DELSUTH, with a view to generate context-specific evidence that will improve antenatal counseling, intrapartum monitoring, and postpartum emergency care. It will also guide healthcare providers and policymakers in facilitating prompt identification of high-risk patients and enhancing the management of the third stage of labour. Ultimately, this will contribute to the goal of decreasing maternal morbidity and mortality rates in Delta State and Nigeria, in line with sustainable development goal (SDG) 3.1.

MATERIALS AND METHODS

Study Design and Setting

At the Obstetric unit of the Department of Obstetrics and Gynaecology of Delta State University Teaching Hospital (DELSUTH), we conducted a 10-year retrospective descriptive study between January 1st, 2011 and December 31st 2020. Patients are referred from the neighbouring states of Edo, Bayelsa and Rivers State to DELSUTH, Oghara, for specialized care. The patients are usually referred from primary and secondary health care facilities, private hospitals, maternity homes, and traditional birth attendant facilities where deliveries are conducted.

Retained placenta was defined as failure to deliver the placenta within 30 minutes after delivery of the fetus.

Inclusion and Exclusion Criteria

Inclusion criteria were women with singleton vaginal deliveries, diagnosis of retained placenta and complete medical records.

Exclusion criteria were women with multiple gestation, those who underwent elective caesarean section and incomplete or missing patient records

Sample Size and Sampling Method

All eligible cases that met the inclusion criteria within the ten-year study period were included using a total population sampling method. A total of 21 cases were analyzed.

Data Collection

Structured data collection proforma was used to extract data from labour ward registers, delivery records, and patient case files. Socio-demographic data (age, residence, educational status), obstetric history (parity, booking status, history of uterine surgeries), clinical subtype of retained placenta (trapped or adherent/accreta), time from delivery to diagnosis, and risk factors such as prolonged oxytocin use, preterm delivery, and previous dilatation and curettage, were the variables collated for analysis.

Case definition

- Trapped placenta was defined as placenta detached but retained within the uterus due to cervical closure or uterine atony.
- Adherent/Accreta placenta was the placenta partially or completely adherent to the uterine wall requiring manual or surgical removal.
- Delay in diagnosis was defined as the time from fetal delivery to diagnosis of retained placenta exceeding 30 minutes.

Data Analysis

We entered the Data and analyzed it using Statistical Package for the Social Sciences (IBM SPSS) version 28.0. Descriptive statistics were used to summarize variables in frequencies and percentages. Chi-square or Fisher's exact test (where appropriate) was used to examine associations between risk factors and types of retained placenta. Binary logistic regression analysis was performed to identify independent predictors of trapped versus adherent/accreta placenta. A p-value < 0.05 was considered statistically significant.

Ethical approval

The Health Research Ethics Committee of the Delta State University Teaching Hospital, Oghara granted us ethical approval to carry out this study. Patient anonymity was maintained by excluding names and unique identifiers during data extraction and analysis. The study adhered to the principles of the Declaration of Helsinki.

RESULTS

During the 10-year period, there were 24 cases of retained placenta out of 2003 total deliveries, giving an incidence of 1.2%. However, only 21 patients' case records were available with complete information for analysis.

The socio-demographic features of the study group are presented in table 1. Patients' ages varied from 18 to 41 years, with an average age of 29.8 ± 5.4 years. Most of the patients 11 (52.4%) fell within the 30–39 years age bracket, while just 1 (4.8%) were 40 years or older. Most patients 11 (52.4%) resided in rural areas. Multiparous women constituted the largest parity group 11 (52.4%) followed by grand multiparas 6 (28.6%). Among the study population 6 (28.6%) and 15 (71.4%) of the patients were unbooked and booked for antenatal care, respectively. Over half of the women 11 (52.4%) had secondary education 5 (23.8%) had primary education, and 3 (14.3%) attained tertiary education.

Two women (9.5%) had no formal education.

The identified risk factors among women with retained placenta are shown in table 2. Unbooked pregnancy status was the predominant risk factor identified, occurring in 15 (71.4%) of cases. Preterm delivery was recorded in 10 (47.6%) of cases, while in 6 (28.6%) of cases, both high parity and prolonged use of oxytocin were observed. A previous history of dilatation and curettage (D&C) was present in 8 (38.1%), previous caesarean section in 5 (23.8%) and prior myomectomy in 3 (14.3%). Some patients had multiple coexisting risk factors.

Figure 1 (pie chart) depicts the time of diagnosis of retained placenta. The time from delivery to diagnosis of retained placenta varied across patients. The majority 13 (61.9%) were diagnosed between 31–60 minutes post-delivery. The mean time to diagnosis was 82.0 ± 36.9 minutes. Only 2 (9.5%) were diagnosed within 61–90 minutes, while 3 (14.3%) were diagnosed beyond 120 minutes.

Figure 2 (pie chart) shows the types of retained placenta among the study population. Two major types of retained placenta were identified. Trapped placenta accounted for 11 (52.4%) of cases, adherent 9 (42.8%) and placenta accreta accounted for 1 (4.8%)

Table 3 illustrates risk factor comparison between trapped and adherent/accreta retained placenta. High parity was significantly associated with adherent/accreta placenta 5 (50.0%) compared to trapped placenta 1 (9.1%) ($\chi^2 = 4.295$, $p = 0.038$). Similarly, previous dilatation and curettage was significantly more common among women with adherent/accreta placenta 6 (60.0%) than those with trapped placenta (18.2%) ($\chi^2 = 3.884$, $p = 0.049$). Unbooked pregnancy was common in both groups, higher in trapped placenta 9 (81.8%) than adherent/accreta 6 (60.0%), but not statistically significant (p=0.269). Advanced maternal age, history of retained placenta and myomectomy showed higher proportions in adherent/accreta cases but without statistical significance. Likewise, although no statistical significance was shown, prolonged oxytocin use and previous CS were more in the trapped retained placenta subtype.

The regression analysis showing the predictors of participants presenting with trapped placenta compared with adherent/accreta placenta is shown on table 4. The significant independent predictors which increased the likelihood of participants presenting with adherent/accreta placenta were high parity (AOR=26.277; 95% CI=1.323 – 521.733; p=0.032) and previous history of dilatation and curettage (AOR=17.142; 95% CI=1.235 – 237.986; p=0.034).

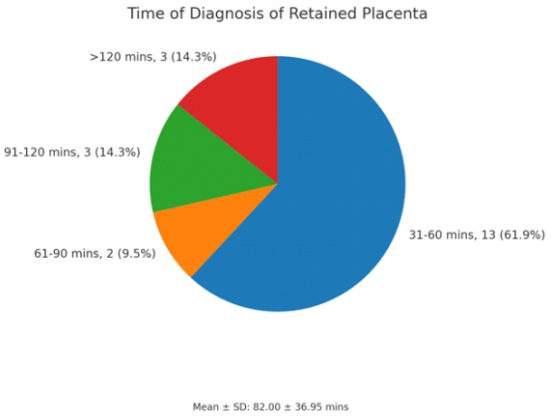

Figure 1: Showing time of diagnosis of retained placenta

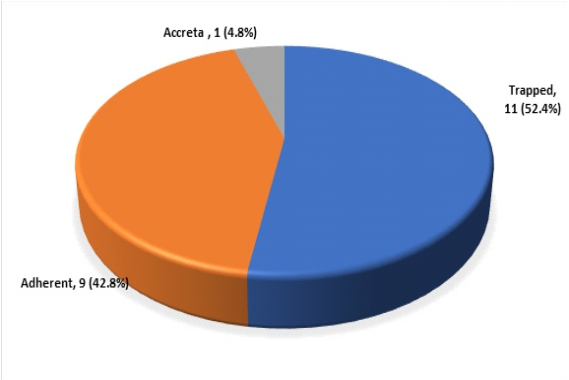

Figure 2: Pie chart showing the various types of retained placenta

Table 1: Socio-demographic characteristics

Characteristics		Frequencies	Percentages (%)
Age (years)	<20	2	9.5
	20-29	7	33.3
	30-39	11	52.4
	≥40	1	4.8
Residence	Rural	11	52.4
	Urban	10	47.6
Parity	Nullipara	2	9.5
	Primipara	2	9.5
	Multipara	11	52.4
	Grand multipara	6	28.6
Educational level	None	2	9.5
	Primary	5	23.8
	Secondary	11	52.4
	Tertiary	3	14.3
Booking Status	Booked	6	28.6
	Unbooked	15	71.4

Age range = 18 – 41 years

Table 2: Identified risk factors among Women with retained placenta

	Frequencies	Percentages (%)
Unbooked pregnancy	15	71.4
Preterm	10	47.6
High parity	6	28.6
Prolonged use of Oxytocin	6	28.6
Retained placenta	4	19.0
Advanced maternal age	4	19.0
Previous Dilatation and curettage	8	38.1
Previous caesarean section	5	23.8
Previous myomectomy	3	14.3

Some patients had more than one identified risk factor

Table 3: Risk Factor Comparison Between Trapped and Adherent/Accreta Retained Placenta

	Trapped Placenta n (%)	Adherent/Accreta Placenta n (%)	χ^2	p-value
Unbooked pregnancy	9 (81.8)	6 (60.0)	1.222	0.269
Advanced maternal age	1 (9.1)	3 (30.0)	1.485	0.223
High Parity	1 (9.1)	5 (50.0)	4.295	*0.038
Preterm	5 (45.5)	5 (50.0)	0.029	0.864
Prolonged use of Oxytocin	4 (36.4)	2 (20.0)	0.687	0.407
Previous Retained placenta	1 (9.1)	3 (30.0)	1.485	0.223
Previous D&C	2 (18.2)	6 (60.0)	3.884	*0.049
Previous caesarean section	3 (27.3)	2 (20.0)	0.153	0.696
Previous myomectomy	0 (0.0)	3 (30.0)	3.850	0.090

D&C – Dilatation and curettage | * – Statistically significant

Table 4: Regression Analysis Showing Predictors of Retained Placenta Subtypes

	B	S.E.	AOR	95% C.I. for AOR		p-value
				Lower	Upper	
High Parity	3.269	1.525	26.277	1.323	521.733	0.032
Previous D&C	2.842	1.342	17.142	1.235	237.986	0.034

B-Regression Coefficient; S.E- Standard Error; AOR- Adjusted Odds Ratio; CI- Confidence Interval

DISCUSSION

Our study investigated the patterns, factors, and delays in diagnosis associated with retained placenta in women treated at Delta State University Teaching Hospital in Oghara over a ten-year period. The findings provide valuable insight into the subtype-specific risk factors for retained placenta and highlight key areas for intervention to reduce associated maternal morbidity.

The majority of women with retained placenta in our study were between 30 and 39 years of age and multiparous, with over half residing in rural areas. Only 6 (28.6%) were booked for antenatal care. These findings are consistent with those reported by Ajayi *et al*. in Southwest Nigeria, where advanced maternal age, high parity, and low antenatal care uptake were common features among women with third-stage labour complications. [23] In contrast, Ugoji *et al* in Ebonyi State, Nigeria, and Alam *et al* in

Bangladesh reported 20-30 years age bracket as the predominant age for women with retained placenta. [21,22] The higher age bracket and parity recorded in our study might be a reflection of the reproductive potential of the study population. Women in rural areas may be more likely to have larger family sizes (high parity) and continue childbearing into their late 30s, both of which may have influenced the age and parity profiles seen in our study. Additionally, as the women become older, they may be more susceptible to possible endometrial injuries resulting from procedures like dilatation and curettage and myomectomy, which ultimately contribute to the occurrence of retained placenta. [14,19,20]

The high proportion of unbooked cases 15 (71.4%) in our study emphasizes the association between lack of antenatal care and adverse feto-maternal outcomes in sub-Saharan Africa. Unbooked women are less likely to benefit from supervised deliveries and timely referral in the event of complications, including retained placenta. [24]

The most common risk factors identified in our study were unbooked pregnancy 15 (71.4%), preterm delivery 10 (47.6%), previous dilatation and curettage 8 (38.1%), high parity and prolonged oxytocin use, 6 (28.6%) each, and a history of previous caesarean section 5 (23.8%). These findings align with previous studies in Nigeria and other areas, which have consistently associated uterine instrumentation, high parity, and preterm birth with retained placenta. [14,16,19,20,23.]

Preterm deliveries were significantly represented in this study, supporting the hypothesis that incomplete maturation of the placental interface may predispose to retention, especially in adherent forms. This is consistent with findings from a Bangladesh study by Alam et al and a study done by Adeniyi et al in Nigeria., which reported a higher prevalence of retained placenta among preterm deliveries. [22, 25] The role of previous uterine surgeries, such as D&C, in the development of adherent placenta is plausible due to the potential for endometrial scarring and defective decidualization. This study confirms that history of D&C was significantly more common among patients with adherent/accreta placenta, a finding corroborated by several studies. [14,15,20,23]

The average time to diagnosis of retained placenta in our study was 82 minutes, with only 13 (61.9%) of patients diagnosed within the first hour. Delays beyond 60 minutes occurred in over one-third of cases. Although a universal definition for retained placenta is yet to be established, the 82 minutes recorded indicates a delay beyond the standard 30-minutes definition used in most guidelines. [11. 12] Furthermore, while Pelman and Carusi [14] reported that diagnosis typically occurred within 30–60 minutes in well-managed settings, Ugoji *et al* in Nigeria reported that patients were diagnosed of retained placenta after 60minutes of the delivery of the baby with a mean duration of 6.74 hours. [21] These delays are clinically significant and increase the risk of adverse outcomes. The prolonged time to diagnosis in this study may be attributed to several factors, including unskilled birth attendants, poor third-stage monitoring protocols, insufficient training in early identification of placental retention and delay in referring cases. In some referral from rural areas, delays might stem from time spent in transportation before arriving at DELSUTH. Enhancing guidelines for third-stage of labour management, early identification of retained placentas, and ensuring prompt referrals for high-risk women can assist in minimizing related maternal and fetal complications.

Trapped placenta was more common than adherent/accreta placenta in our cohort. This is at variance with findings of study done by Ramadan *et al* [15], where adherent placenta was the most common subtype following vaginal delivery. Trapped placenta was more common in our study, likely because it often presents unexpectedly after vaginal deliveries, most of which were conducted outside of our labour ward by unskilled birth attendants. In contrast, adherent/accreta placenta is frequently anticipated and managed by caesarean section, limiting its occurrence following vaginal delivery. Differences in diagnostic ability and third-stage management may also explain the variation from findings documented by Ramadan *et al*. [15]

Binary logistic regression revealed that high parity and previous D&C were independent predictors of adherent/accreta placenta. High parity has been consistently associated with uterine atony,

myometrial thinning, and abnormal placental implantation, all of which may predispose to placenta accreta spectrum disorders. [14,20] Likewise, a history of D&C may lead to defective decidualization, increasing the risk of abnormal adherence. These findings are consistent with the report by Perlman & Carusi [20] and Favilli et al, who found strong associations between adherent placenta and high parity (≥5), as well as prior uterine instrumentation [14, 20] The statistical significance of these factors in our study emphasizes the importance of comprehensive antenatal history-taking to identify women at risk of PAS disorders. In such patients, preparedness with surgical back-up, blood products, and senior obstetrician presence during delivery is essential.

The implications of this study are far-reaching because the high proportion of preventable risk factors such as unbooked status, high parity, and prior D&C suggests that many cases of retained placenta may be avoidable through reduced family size, improved antenatal care and safer abortion services. Furthermore, parturients with a history of high parity, prior uterine surgeries, or previous history of retained placenta should be recognized early and carefully monitored throughout labour. In resource-limited settings like ours, where access to ultrasonography for placental assessment may be limited, it is important to uphold clinical vigilance for prevention. A strength of this study is the focused analysis of subtype-specific risk factors and delays in diagnosis, which are underreported in existing Nigerian literature.

CONCLUSION

Retained placenta remains a persistent obstetric challenge during the third stage of labour at Delta State University Teaching Hospital (DELSUTH), particularly among unbooked, multiparous women with previous uterine surgeries. Although trapped placenta was more common, adherent/accreta placenta carried a higher risk. Delays in diagnosis highlights critical gaps in third-stage labour monitoring and prompt clinical decision-making in the face of retained placenta. This study reinforces the need for booking for antenatal care in centres with skilled birth attendants, improved labour ward protocols, and timely referral systems. Early identification of high-risk women and preparedness during delivery may reduce morbidity and mortality associated with retained placenta.

Recommendations

We recommend that antenatal care should be promoted, especially in rural areas, with better monitoring during the third stage of labour. Skilled birth attendants need training to detect and manage retained placenta early. Quick referrals and timely treatment can greatly reduce the risks to mothers.

Limitations

Despite the strength of our study, it has limitations, such as its retrospective design, a small number of patients, and dependence on secondary data, which could be influenced by documentation bias. Furthermore, conducting the research at a single center might restrict its applicability to a broader population.

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Conflict of Interest

The authors declare no conflict of interest

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