Prevalence, Causes and Surgical Outcomes in Women with Uterine Rupture at a Tertiary Hospital in Port-Harcourt, Nigeria - Lessons for Obstetric Care

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Abstract

Background: Uterine rupture (UR) is a life-threatening obstetric emergency often associated with grave maternal and fetal consequences. This unfortunate, mostly preventable event, although exceedingly rare in developed world, has remained a significant problem in developing nations.

Objective: This study sought to determine the prevalence and causes of UR, evaluate the surgical outcome, and assess the associated factors in women.

Methodology: This was a retrospective review of cases of UR managed between January 2016 and December 2020. Data were obtained from operating theater and labour ward records. Information on maternal age, parity, gestational age, booking status, education, cause of UR, type of surgery, cadre of surgeon, length of surgery, estimated blood loss and any blood transfusion, and mortality, were extracted. Data were analyzed using SPSS version 20. The Chi-square test or Fisher exact test and analysis of variance test were used for statistical analysis of non-continuous and continuous variables as appropriate and statistical significance was set at p < 0.05.

Results: During the five-year study period, there were 11,981 deliveries, of which 95 women were managed for UR, giving a prevalence of 0.8% or ratio of about 1:126 women. Most of the UR, 44 (46.3%), occurred in women with previous caesarean section scar in labour, followed by obstructed labour in 25 (26.3%). There was significant association between booking status and occurrence of UR (P = 0.003). Most of the women, 82 (86.3%), had repair of the uterus ± BTL, 9 (9.5%) had subtotal hysterectomy, while 4 (4.2%) had total hysterectomy. There was significant association between parity and type of surgery performed (P = 0.028) and cadre of surgeon with the mean estimated blood loss at surgery (P = 0.045). There were 5 maternal deaths, giving a rate of 5.3% or a case fatality of 1:19 women and 67 (70.5%) perinatal deaths, giving a perinatal mortality ratio of about 1:1.5 cases. There was significant association between maternal death and mean estimated blood loss (P = 0.016) and mean duration of surgery (P = 0.015), while perinatal death was significantly associated with mean estimated blood loss (P = 0.010) only.

Conclusion: The prevalence of UR of 1:126 in this study was high. Previous caesarean scar and lack of quality ANC (unbooked status) were significantly associated with UR. Most cases of UR had a repair without sterilization, and this was significantly associated with parity. The high maternal and perinatal mortality in this study was significantly associated with estimated blood loss.

Keywords: Uterine Rupture; Previous Caesarean Section; Obstructed Labour; Prolonged Labour; Obstetric Hysterectomy; Unbooked Mother

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Introduction

Uterine rupture (UR) is a life-threatening obstetric emergency often associated with grave maternal and fetal consequences. This unfortunate, mostly preventable event, although exceedingly rare in developed world, has remained a significant problem in developing nations [1]. It is the disruption of the uterine wall resulting in a spectrum of conditions ranging from clinically difficult to detect tear, to a complete rupture often associated with massive bleeding and extrusion of the fetus from the uterus into the peritoneal cavity [2]. Uterine rupture usually occurs during labour but can occur during pregnancy before the onset of labour [3,4]. It has also been reported in all trimesters of pregnancy [5].

Globally, the incidence of UR has been reported as 0.07%, which is much lower than the 1.3% reported for Africa [6]. Studies from Nigeria have reported prevalence ranging from 1:86 deliveries in Afikpo [7] and 1:161 deliveries in Nnewi [8] to 1:258 deliveries in Ado-Ekiti [9]. Two studies from Ethiopia have reported prevalence of 1:41 deliveries [10] and 1:110 deliveries [11] and a study from Ugandan has reported 1:131 deliveries [12]. Nigerian studies have reported case fatality rates ranging from 5.9% to 33% [7,9,13,14] and perinatal mortality of about 85% [7,9].

The major risk factors for UR in developing countries are both obstetric and non-obstetric factors such as multiparity, cephalopelvic disproportion, prolonged and obstructed labour, fetal macrosomia, use of Oxytocics and previous uterine scars, made worst by ignorance, poverty, poor obstetric services, non-utilization of available services, cultural beliefs, and aversion for caesarean delivery [7,13]. While in developed countries a scarred uterus and oxytocic stimulation of labour are the major causes of UR, the causes in Nigeria have remained essentially the same [15,16]; though with increase in caesarean delivery scarred uterus are now becoming a significant contributor to uterine rupture in Nigeria [17].

The management outcome in UR depends largely on the timing of presentation and promptness of intervention. It has been postulated that clinically significant fetal morbidity can occur after 10 - 37 minutes of the occurrence of UR, if urgent delivery is not undertaken [4,18]. The immediate consequences for the mother are hypovolaemic shock, anaemia, and death, while the fetus might suffer hypoxia, anaemia, and death [12,19]. Modalities of management at laparotomy includes repair of the uterus with or without tubal ligation, subtotal hysterectomy, or total hysterectomy, depending on the extent of tear, haemodynamic status of the patient and skills of the surgeon.

Post-operative complications in survivors may include anaemia, wound sepsis, and wound breakdown, while in addition, some women will lose their uterus and compromise their future fertility [20,21]. Loss of fertility in some communities that regard reproduction as the essence of womanhood can result in socio-cultural implications like divorce [22,23].

There is paucity of data on UR in our environment. To date, there has been no study carried out to evaluate UR at the Rivers State University Teaching Hospital (RSUTH) Port-Harcourt, Nigeria. It is important to determine the prevalence, causes, surgical outcomes and associated factors to serve as baseline for further research. This study therefore sought to determine the prevalence and causes of UR in women delivering at the RSUTH, evaluate the surgical outcome and assess the associated factors for UR in women. Findings from this study may serve to provide the basis for evidence-based recommendations/policies that may stem the tide of this obstetric catastrophe.

Materials and Methods

This was a descriptive, retrospective review of cases of UR managed at the Rivers State University Teaching Hospital (RSUTH) from 1st January 2016 to 31st December 2020. The RSUTH is a tertiary hospital owned and funded by the Government of Rivers State of Nigeria. The hospital provides emergency obstetric services to women referred from other centres, as well as providing antenatal care and delivery services for low and high-risk pregnant women booked with the hospital. The hospital is well equipped and has availability of qualified team comprising of Obstetricians, Paediatricians and Anaesthetists. There is availability of laboratory and blood bank services

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in the hospital. The Labour Ward is open 24/7 and there is an annual delivery of over 1500. Ethical clearance was sought for and approval obtained from the RSUTH Research and Ethics Committee (RSUTH/REC/2021080).

The protocol for management of UR in RSUTH is immediate resuscitation of the patient with intravenous fluids, commencement of intravenous broad-spectrum antibiotics, blood transfusion and laparotomy immediately the patient is well resuscitated. At laparotomy either a hysterectomy (total or subtotal) or uterine repair with or without sterilization (BTL) is carried out depending on the haemodynamic state of the patient, the parity or extent of uterine damage.

The study population was all pregnant women who had UR and were managed at the RSUTH. All cases of UR over the five-year period with complete records were included. Those with incomplete data were excluded. Data were retrieved from the Labour ward records and theatre registers, using a structured proforma. Information on maternal age, parity, gestational age, booking status, education, cause of uterine rupture, type of surgery, cadre of surgeon, length of surgery, estimated blood loss and any blood transfusion, and mortality, were extracted.

Coded data were entered into Excel spreadsheet and exported to SPSS version 20 for statistical analysis. Categorical measurements were given as numbers and percentages, and numerical measurements as mean and standard deviation. The Chi-square test or Fisher exact test and ANOVA test were used for statistical analysis of non-continuous and continuous variables as appropriate and statistical significance was set at $p < 0.05$.

Results

During the five-year study period, there were 11,981 deliveries, of which 95 women were managed for UR, giving a prevalence of 0.8% or ratio of about 1:126 women (Figure 1). The mean age of the study population ± SD was 31.79 ± 4.39 years, the median age was 32 years and the age range was 22 - 42 years. The median parity was Para 2, with a range of Para 0 - 4. Majority of the women 59 (62.1%) were unbooked for antenatal care, 78 (82.1%) were at term, gestational age at presentation ≥ 37 weeks, and 60 (63.2%) had attained secondary level of education (Table 1).
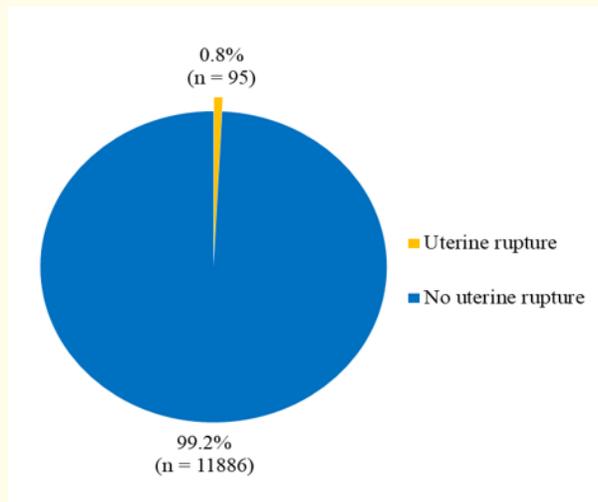

Figure 1: *Prevalence of uterine rupture among women delivering at the RSUTH.*

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Variables (N = 95)	Frequency	Percentage
Age category		
< 30 years	28	29.5
31 - 34 years	45	47.4
35 - 39 years	19	20.0
≥ 40 years	3	3.2
Educational level		
Primary	8	8.4
Secondary	60	63.2
Tertiary	27	28.4
Parity		
Para 0	6	6.3
Para 1	37	38.9
Para 2	28	29.5
Para 3	17	17.9
Para 4	7	7.4
Gestational age		
< 37 weeks	17	17.9
≥ 37 weeks	78	82.1
Booking status		
Booked	29	30.5
Unbooked	59	62.1
Defaulted	7	7.4

Table 1: Demographic and obstetric characteristics of women with uterine rupture at the RSUTH.

Most of the UR, 44 (46.3%), occurred in women with previous caesarean section scars in labour, followed by neglected obstructed labour in 25 (26.3%) of the women. Other causes were prolonged labour 14 (14.7%), Induction of labour with Oxytocics 6 (6.3%), traditional massage 5 (5.3%) and trauma in 1 (1.1%) (Figure 2). The relationship between demographic and obstetric characteristics, and occurrence and causes of UR is as shown in table 2. There was a significant association between booking status and occurrence of UR (P = 0.003). There was no significant relationship between occurrence of UR with maternal age, education, parity, and gestational age at presentation.
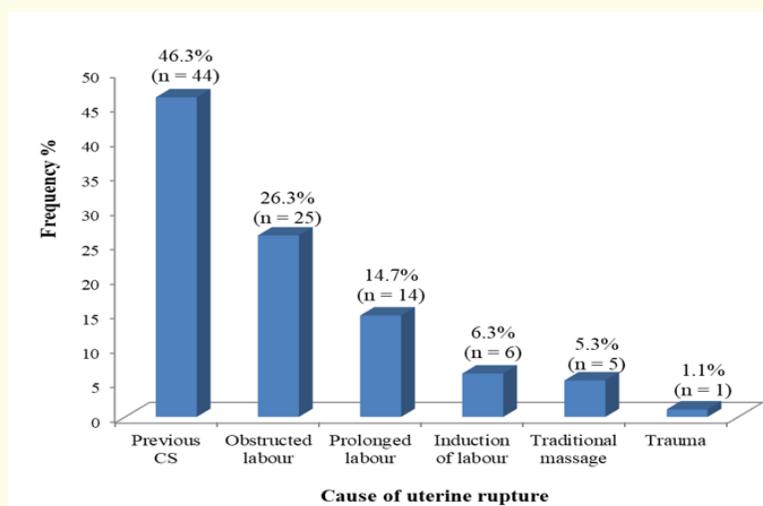

Figure 2: Causes of uterine rupture among women delivering at RSUTH.

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Variables	Cause of uterine rupture						Total n (%)
	Induction of labour n (%)	Obstructed labour n (%)	Previous CS n (%)	Prolonged labour n (%)	Traditional massage n (%)	Trauma n (%)	
Age category							
< 30 years	2 (7.1)	6 (21.4)	13 (46.4)	5 (17.9)	2 (7.1)	0 (0.0)	28 (100.0)
30 - 34 years	3 (6.7)	13 (28.9)	22 (48.9)	6 (13.3)	0 (0.0)	1 (2.2)	45 (100.0)
35 - 39 years	0 (0.0)	5 (26.3)	9 (47.4)	3 (15.8)	2 (10.5)	0 (0.0)	19 (100.0)
≥ 40 years	1 (33.3)	1 (33.3)	0 (0.0)	0 (0.0)	1 (33.3)	0 (0.0)	3 (100.0)
	Fisher's exact test = 17.261; p-value = 0.267						
Educational level							
Primary	1 (12.5)	1 (12.5)	3 (37.5)	3 (37.5)	0 (0.0)	0 (0.0)	8 (100.0)
Secondary	4 (6.7)	20 (33.3)	26 (43.3)	6 (10.0)	3 (5.0)	1 (1.7)	60 (100.0)
Tertiary	1 (3.7)	4 (14.8)	15 (55.6)	5 (18.5)	2 (7.4)	0 (0.0)	27 (100.0)
	Fisher's exact test = 10.470; p-value = 0.355						
Parity							
Para 0	1 (16.7)	5 (83.3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	6 (100.0)
Para 1	2 (5.4)	7 (18.9)	21 (56.8)	4 (10.8)	2 (5.4)	1 (2.7)	37 (100.0)
Para 2	2 (7.1)	5 (17.9)	14 (50.0)	4 (14.3)	3 (10.7)	0 (0.0)	28 (100.0)
Para 3	1 (5.9)	4 (23.5)	8 (47.1)	4 (23.5)	0 (0.0)	0 (0.0)	17 (100.0)
Para 4	0 (0.0)	4 (57.1)	1 (14.3)	2 (28.6)	0 (0.0)	0 (0.0)	7 (100.0)
	Fisher's exact test = 25.236 p-value = 0.097						
Gestational age							
<37 weeks	0 (0.0)	5 (29.4)	8 (47.1)	3 (17.6)	0 (0.0)	1 (5.9)	17 (100.0)
≥37 weeks	6 (7.7)	20 (25.6)	36 (46.2)	11 (14.1)	5 (6.4)	0 (0.0)	78 (100.0)
	Fisher's exact test = 5.146; p-value = 0.377						
Booking status							
Booked	4 (13.8)	3 (10.3)	19 (65.5)	2 (6.9)	1 (3.4)	0 (0.0)	29 (100.0)
Unbooked	2 (3.4)	21 (35.6)	24 (40.7)	9 (15.3)	2 (3.4)	1 (1.7)	59 (100.0)
Defaulted	0 (0.0)	1 (14.3)	1 (14.3)	3 (42.9)	2 (28.6)	0 (0.0)	7 (100.0)
	Fisher's exact test = 22.919; p-value = 0.003*						

***Table 2:** Relationship between demographic and obstetric characteristics, and cause of uterine rupture among women delivering at RSUTH.*
*Statistically significant (p < 0.05).

Most of the women, 82 (86.3%), had a repair of the rupture ± BTL, 9 (9.5%) had a subtotal abdominal hysterectomy (SAH), while 4 (4.2%) had a total abdominal hysterectomy (TAH). The relationship between cadre of surgeon, demographic and obstetric characteristics, and type of surgery performed for the UR is as shown in table 3. There was significant association between parity of the women and type of surgery performed (P = 0.028). There was no significant relationship between type of surgery performed with maternal age, education, booking status and gestational age at presentation. A comparison of the mean estimated blood loss and mean duration of surgery with

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the socio-demographic and obstetric characteristics, and cadre of surgeon among the women is as shown in table 4. There was significant association of cadre of surgeon with the mean estimated blood loss at surgery (P = 0.045), but not with the mean duration of surgery. There was no significant association of mean estimated blood loss and mean duration of surgery with maternal age, education, gestational age at presentation and booking status.

Variables	Type of surgery			Total n (%)
	Repair n (%)	SAH n (%)	TAH n (%)	
Age category				
< 30 years	25 (89.3)	3 (10.7)	0 (0.0)	28 (100.0)
30 - 34 years	39 (86.7)	4 (8.9)	2 (4.4)	45 (100.0)
35 - 39 years	15 (78.9)	2 (10.5)	2 (10.5)	19 (100.0)
≥ 40 years	3 (100.0)	0 (0.0)	0 (0.0)	3 (100.0)
	Fisher's exact test = 3.913; p-value = 0.708			
Educational level				
Primary	8 (100.0)	0 (0.0)	0 (0.0)	8 (100.0)
Secondary	52 (86.7)	5 (8.3)	3 (5.0)	60 (100.0)
Tertiary	22 (81.5)	4 (14.8)	1 (3.7)	27 (100.0)
	Fisher's exact test = 1.689; p-value = 0.842			
Parity				
Para 0	6 (100.0)	0 (0.0)	0 (0.0)	6 (100.0)
Para 1	36 (97.3)	1 (2.7)	0 (0.0)	37 (100.0)
Para 2	24 (85.7)	2 (7.1)	2 (7.1)	28 (100.0)
Para 3	11 (64.7)	4 (23.5)	2 (11.8)	17 (100.0)
Para 4	5 (71.4)	2 (28.6)	0 (0.0)	7 (100.0)
	Fisher's exact test = 13.773 p-value = 0.028*			
Gestational age				
<37 weeks	13 (76.5)	3 (17.6)	1 (5.9)	17 (100.0)
≥37 weeks	69 (88.5)	6 (7.7)	3 (3.8)	78 (100.0)
	Fisher's exact test = 2.403; p-value = 0.250			
Booking status				
Booked	26 (89.7)	2 (6.9)	1 (3.4)	29 (100.0)
Unbooked	50 (84.7)	7 (11.9)	2 (3.4)	59 (100.0)
Defaulted	6 (85.7)	0 (0.0)	1 (14.3)	7 (100.0)
	Fisher's exact test = 2.868; p-value = 0.558			
Cadre of surgeon				
Consultant	38 (82.6)	6 (13.0)	2 (4.3)	46 (100.0)
Registrar	44 (89.8)	3 (6.1)	2 (4.1)	49 (100.0)
	Fisher's exact test = 1.433; p-value = 0.534			

Table 3: Relationship between cadre of surgeon, demographic and obstetrics characteristics, and type of surgery among women with ruptured uterus at RSUTH.
*Statistically significant (p < 0.05).

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Variables	Estimated blood loss (mls) Mean ± SD	Duration of surgery (minutes) Mean ± SD
Age category		
<30years	1055.36 ± 493.92	78.96 ± 30.52
30 – 34 years	1263.33 ± 742.72	85.93 ± 33.02
35 – 39 years	1015.79 ± 562.99	77.47 ± 31.37
≥40 years	516.67 ± 144.34	60.33 ± 8.39
	ANOVA = 1.933 p-value = 0.130	ANOVA = 0.905 p-value = 0.442
Educational level		
Primary	918.75 ± 742.55	72.13 ± 22.59
Secondary	1110.00 ± 616.84	80.20 ± 30.20
Tertiary	1233.33 ± 678.23	86.74 ± 36.58
	ANOVA = 0.804 p-value = 0.450	ANOVA = 0.771 p-value = 0.466
Parity		
Para 0	1033.33 ± 823.81	61.33 ± 11.52
Para 1	1067.57 ± 675.07	76.73 ± 27.59
Para 2	1085.71 ± 558.91	83.39 ± 31.42
Para 3	1223.53 ± 510.55	97.12 ± 43.61
Para 4	1478.57 ± 938.02	76.86 ± 12.06
	ANOVA = 0.749 p-value = 0.561	ANOVA = 2.008 p-value = 0.100
Gestational age		
<37 weeks	958.82 ± 452.85	84.47 ± 42.06
≥34 weeks	1166.03 ± 674.75	80.71 ± 29.10
	t = -1.206 p-value = 0.236	t = 0.444 p-value = 0.658
Booking status		
Booked	1006.90 ± 446.56	83.86 ± 32.16
Unbooked	1195.76 ± 714.88	80.73 ± 32.39
Defaulted	1071.43 ± 706.43	76.57 ± 24.30
	ANOVA = 0.865 p-value = 0.425	ANOVA = 0.180 p-value = 0.835
Cadre of surgeon		
Consultant	1265 ± 22 ± 709.69	82.11 ± 35.99
Registrar	1001.02 ± 551.84	80.69 ± 27.15
	t = 2.033 p-value = 0.045*	t = 0.217 p-value = 0.829

Table 4: Comparison of mean estimated blood loss and duration of surgery by socio-demographic and obstetric characteristics, and cadre of surgeon among women with uterine rupture at the RSUTH.
*Statistically significant (p < 0.05).

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There were 5 maternal deaths, giving a rate of 5.3% or a case fatality of 1:19 women (Figure 3) and 67 (70.5%) perinatal deaths, giving a perinatal mortality ratio of about 1:1.5 cases (Table 5). A comparison of the mean estimated blood loss and mean duration of surgery with maternal death and perinatal death among the women with UR is as shown in table 6. There was a significant association between maternal death and mean estimated blood loss (P = 0.016) and mean duration of surgery (P = 0.015), while perinatal death was significantly associated with mean estimated blood loss (P = 0.010) but not with mean duration of surgery (P = 0.220).

Perinatal death	Frequency	Percentage
Yes	67	70.5
No	28	29.5
Total	95	100.0

Table 5: *Fetal outcome among women with uterine rupture at the RSUTH.*

Variables	Estimated blood loss (mls) Mean ± SD	Duration of surgery (minutes) Mean ± SD
Maternal death		
Yes	1800.00 ± 670.82	114.60 ± 40.81
No	1091.67 ± 624.96	79.53 ± 30.21
	t = 2.459 p-value = 0.016*	t = 2.483 p-value = 0.015*
Perinatal death		
Yes	1238.06 ± 673.36	83.96 ± 32.07
No	867.86 ± 483.28	75.21 ± 30.00
	t = 2.636 p-value = 0.010*	t = 1.234 p-value = 0.220

Table 6: *Comparison of mean estimated blood loss and duration of surgery by maternal death and perinatal death among women uterine rupture at the RSUTH.*
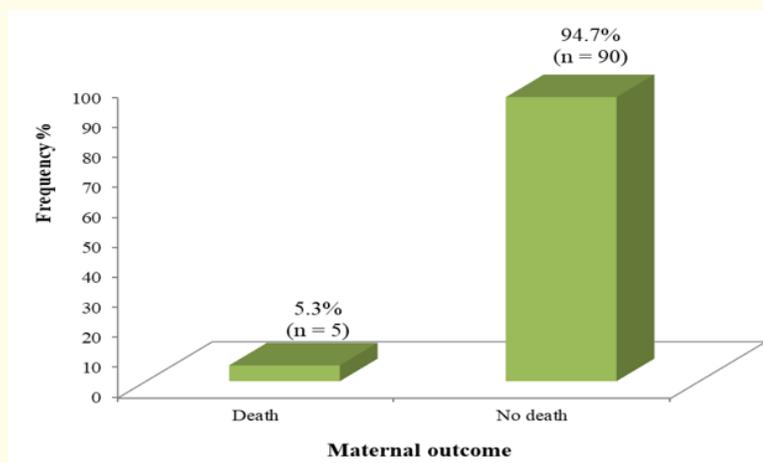
*Statistically significant (p < 0.05).

Figure 3: *Maternal outcome (death) among women with uterine rupture at the RSUTH.*

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Discussion

The prevalence of UR in this study of 0.8% or 1:126 women is comparatively high. This is comparable to the findings in similar studies of 1:110 [11], 1:131 [12] and 1:161 [8]. It is, however, higher than a report from Ekiti, Nigeria of 1:258 [9] but lower than 1:86 reported from Afikpo, Nigeria [7] and 1:41 reported from Ethiopia [10]. The prevalence of UR clearly relates to available maternity care, with those areas having high maternal mortality tending to also have high UR rates. Despite global improvements in emergency obstetric care, the associated factors responsible for UR decades ago, are still sadly present in Nigeria today [15,16]. In addition, the rising rates of caesarean section in Nigeria has become a contributory factor and cause for concern [17]. Most patients live where there are no facilities for comprehensive obstetric care, with poor referral systems and poorly developed transport facilities, there is a poor chance of reaching the hospital in good time.

The median parity of para 2 in the study population contrasts with beliefs that UR is a disease of higher parity (≥ 4) women [7,24], but agrees with the finding by Mbamara., *et al.* [8] that it can occur mostly in women of low parity. This finding can be explained in conjunction with another finding in the study of most cases resulting from previous caesarean section scar in labour. The increase in primary caesarean section rates in women of low parity and subsequent rejection of operative delivery is rife in our environment. This fear of and aversion for caesarean section drives them away from centers with skilled manpower and facilities for operative delivery [8]. It has been documented in various studies that because of rising caesarean section rates in sub-Saharan Africa, scarred uterus is increasingly contributing to UR [25].

The occurrence of UR, in this study, among mostly unbooked patients or booked defaulters have also been noted in other studies [7,8,26,27]. Unbooked patients often do not receive quality care during pregnancy, are poorly managed in labour and are usually in a poorer clinical state at presentation to hospital [28,29]. Although most of the causes of UR are preventable, it has continued to strive in Nigeria because of the high rates of unbooked pregnancies, preference by some booked mothers to undergo labour outside of the hospital and the documented aversion of our women to operative deliveries [30].

In terms of the age group of patients found to be most affected, our findings of almost half of the women aged 31 - 34 years, are like findings of other Nigerian studies [7,8,28]. Education has always been thought to play a role in accessing and utilizing available healthcare services. Studies [9,31-33] have shown UR to occur most in women who had little or no formal education and are therefore ignorant and of a lower socio-economic status, likely to face inequalities and barriers to accessing and utilizing care. In this study education did not play a significant role, and the study by Mbamara., *et al.* [8] found a significant association with higher level of education. The differences may come from the population studied, as in our study 87 (91.6%) of the women had secondary education and above.

The extent of surgery for UR depends on the extent of damage to the uterus, the patient's parity or desire for more children, the patient's haemodynamic state and the skill of the surgeon. A majority 82 (86.3%) of the study population had a uterine repair (only 5 of them had a BTL as well). This is like the finding of 88.2% by Eze., *et al.* [7], whose hospital has an advocacy for conservative surgical management. This option is associated with lesser morbidity, operation time and expertise required to perform. In our center most of these patients present at odd times when resident doctors are mostly on ground and perform most of the surgeries and are very sentimental to end the reproductive career of the women. This finding differs from some studies in Nigeria [34,35] where uterine repair with BTL, subtotal hysterectomy and total hysterectomy feature prominently.

Uterine rupture is associated with adverse maternal and perinatal outcomes. The maternal mortality rate of 5.3% found in this study is comparable with 5.9% in Afikpo, Nigeria [7] and 4.9% in Enugu, Nigeria [34] but significantly lower than the 21.3% [28] and 18.9% [9] found in southwestern Nigeria, and 13.2% [35] from Northern Nigeria. It was also lower than the 6.6% reported from Ethiopia [10] and 12% reported from Uganda [12]. The fetal case fatality rate of 70.5% was lower than 84.6% reported from Afikpo, Nigeria [7], 84.9% reported from Ado-Ekiti, Nigeria [9], 98.3% from Ethiopia [10] and 100% from Bida, Nigeria [35]. Similar high maternal and perinatal rates

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have also been reported in other studies [8,18,34]. In contrast a study from Netherlands reported no maternal death from UR, with over 90% of the fetuses salvaged [36]. This poor prognosis in the developing countries is most likely a result of late presentation, occasioned by poverty, delated referral, poor transport network, and lack of ambulance services.

This was a retrospective review of cases of UR. Patient follow-up was limited to what is available in the records, making it difficult to determine complications. Also, the data collected were from a single institution, and as such the findings cannot be generalized. However, the duration of surgery and estimated blood loss was not significantly impacted, as theatre records are well kept and maintained. However, it might be necessary to consider multicenter prospective designs to improve on the findings in this study.

Conclusion

The prevalence of UR of 1:126 in this study was high. Previous caesarean scar and lack of quality ANC (unbooked status) were significantly associated with UR. Most cases of UR had a repair without sterilization, and this was significantly associated with parity. The high maternal and perinatal mortality in this study was significantly associated with estimated blood loss. Prompt diagnosis, adequate resuscitation with fluid and blood transfusion and urgent surgery, will help to optimize both maternal and fetal conditions and improve their outcomes.

The lesson from the study was the need to put preventive measures in place to reduce the occurrence of UR and case fatalities. Widespread presence of comprehensive obstetric care centers, availability and utilization of antenatal care services, targeted health education to reverse aversion for operative delivery, reduction in primary caesarean section rates and empowerment of the female population will reduce this obstetric catastrophe. There is need for policies to strengthen the referral systems to ensure prompt diagnosis and early presentation at well equipped hospitals with facilities for proper management.

Conflict of Interest

All the authors declare no conflict of interest.

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