International Journal of Research and Reports in Gynaecology

4(3): 27-35, 2021; Article no.IJRRGY.72476

A 5-Year Review of Uterine Rupture in the Federal Medical Centre, Yenagoa, South-South Nigeria

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Authors' contributions

This work was carried out in collaboration among all authors. Author DOA wrote the protocol of the study and supervised the entire research. Author PCO conceptualised and designed the study, collated data, wrote the results and the first draft of the manuscript. Authors TJW, DCB and OIO managed literature searches, and wrote the discussion. Authors TRM, GA and BE collected data. All authors read and approved the final manuscript.

Article Information

Editor(s):
(1) Dr. Sevgul Donmez, Gaziantep University, Turkey.
Reviewers:
(1) Hamsa B T, India.
(2) Oyebanji Olufisayo G. Ekiti State University Nigeria.
Complete Peer review History: https://www.sdiarticle4.com/review-history/72476

Original Research Article

Received 06 June 2021
Accepted 11 August 2021
Published 13 August 2021

ABSTRACT

Background: Rupture of the pregnant uterus refers to complete disruption of all uterine layers, including the serosa. It is a life-threatening obstetric emergency and a major cause of maternal and perinatal morbidity and mortality.
Objectives: To determine the incidence of uterine rupture and the maternal and perinatal outcomes associated with it at the Federal Medical Centre, Yenagoa, Bayelsa State, Nigeria over a 5-year period.
Materials and Methods: This retrospective survey was carried out between 1st January, 2016 and 31st December, 2020. Data were retrieved, entered into a pre-designed proforma, and analysed using IBM SPSS version 23.0. Results were presented in frequencies and percentages for categorical variables and mean and standard deviation for continuous variables.

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Results: Thirty-four women presented with uterine rupture out of the 4,571 obstetric patients that were managed in the Centre with an incidence rate of 7.4 per 1,000 pregnancies. Majority (79.4%) of the women were multiparous, and referred (94.1%) from traditional birth attendant (TBA) homes. All the pregnancies were term, unbooked for antenatal care and none of the women had tertiary level of education. There were 3 cases of maternal mortality (case fatality rate of 8.8%) and 28 (82.4%) cases of perinatal mortality.
Conclusion: Uterine rupture is still a major public health problem in the developing countries, that has a high potential for causing perinatal and maternal morbidity and mortality. Behavioural change strategies should be employed in educating women and their spouse through peer education, group engagement and culturally sensitive and acceptable strategies on the need to attend antenatal clinics, and have their deliveries in hospitals equipped with trained and skilled personnel to supervise pregnancy, labour and delivery.

Keywords: Uterine rupture; maternal/perinatal outcomes; unbooked; TBA; emergency; morbidity; mortality.

1. INTRODUCTION

Rupture of the pregnant uterus refers to complete disruption of all uterine layers, including the serosa [1]. It is a life-threatening obstetric emergency and a major cause of maternal and perinatal morbidity and mortality especially in developing countries. It is a common complication in the developing countries due to poor obstetric care, low socioeconomic status, ignorance and adverse sociocultural practices, beliefs and aversion for Caesarean section.

The incidence of uterine rupture varies widely from one Centre to another, and from country to country. Figures from our environment are between 1 in 74 to 1 in 426 deliveries from various hospitals in Nigeria [2,3,4]. Findings from a 5-year retrospective study of uterine rupture at the Niger Delta University Teaching Hospital in Bayelsa State quoted a prevalence of 1 in 97 deliveries [5]. The National Institutes of Health Consensus Development Conference on vaginal birth after Caesarean section concluded that the overall incidence of uterine rupture in women with a prior Caesarean section was approximately 325 per 100,000 women undergoing a trial of labour [6]. A systematic review of similar data estimated 468 uterine ruptures in a group of 100,000 women of any gestational age undergoing VBAC [7].

Uterine rupture can occur in a scarred or an unscarred uterus; which could be spontaneous or traumatic; and can be complete or incomplete. Rupture is commoner at the anterior wall of the lower uterine segment [8]. Identified predisposing factors include the presence of a previous Caesarean section scar, low socioeconomic status, injudicious use of oxytocics, lack of antenatal care, obstructed labour, high parity, uterine hyperstimulation with oxytocics, intrauterine manipulations during labour, abdominal massage, operative vaginal delivery, congenitally malformed uterus, placental growth abnormalities such as placenta increta or percreta and trophoblastic diseases such as invasive mole or choriocarcinoma. The commonest scenario of uterine rupture is the separation of a previous Caesarean section scar, [9] and the women usually present with a sudden onset abdominal pain and vaginal bleeding, associated with progressive weakness and dizziness. They may present with pallor, fainting attacks, tachycardia, abdominal tenderness, rebound tenderness, guarding, and readily palpable foetal parts with absent foetal heart tones. Despite these classical features, a high index of suspicion is required to make the diagnosis of uterine rupture.

Management of uterine rupture involves prompt diagnosis and resuscitation with intravenous fluids and blood transfusion, followed by surgery. The type of surgery performed depends on the patient's clinical state, parity, reproductive wishes, site and extent of the rupture and expertise of the surgeon. Surgical options include uterine repair alone, uterine repair with bilateral tubal ligation and hysterectomy which may be total or subtotal. The success of the management and foetal outcome depends strongly on a high index of suspicion, early diagnosis and immediate intervention [10]. Complications of uterine rupture can be foetal, neonatal or maternal [9]. Foetal complications include foetal distress and intrauterine foetal death. Neonatal complications include birth asphyxia, cerebral palsy and neonatal death. Maternal complications include severe

haemorrhage and subsequent shock, extension to the urinary bladder, broad ligament, uterine arteries, cervix and vagina, and maternal death.

Despite the investments, trainings and improvements in obstetrics healthcare delivery, women and their unborn babies continue to have devastating outcome from unfortunate decisions stemming from either low socioeconomic status, low educational level or cultural beliefs. The effect of these outcomes does not stop at the mother and the unborn baby alone but extends to the family, community and nation at large who are left to care for the morbid mother and child or face the grief of loss in the face of mortality. Thus, the objective of this retrospective survey was to determine the incidence of uterine rupture and the maternal and perinatal outcomes associated with it at the Federal Medical Centre, Yenagoa, Bayelsa State, Nigeria over a 5-year period.

2. MATERIALS AND METHODS

This retrospective survey was carried out at the Department of Obstetrics and Gynaecology, Federal Medical Centre (FMC), Yenagoa, Bayelsa State, South-South, Nigeria between 1st January, 2016 and 31st December, 2020.

All the patients that presented with uterine rupture to the labour ward of this health facility during the period under review were included in this study. All other patients were excluded from the study.

Data were retrieved from the labour ward records, delivery register, theatre records, and patients' folders during the period under review. These records were entered into a pre-designed proforma, and it included, sociodemographic, obstetric and gynecological information, blood transfusion, maternal and foetal outcome, duration of stay in hospital after surgery and total number of deliveries during the period under review.

2.1 Data Analysis

Data were analysed using IBM SPSS version 23.0. Results were presented in frequencies and percentages for categorical variables and mean and standard deviation for continuous variables.

3. RESULTS

3.1 Sociodemographic Characteristics of the Women with Uterine Rupture

In the period under review, 34 women presented with uterine rupture out of the 4,571 obstetric patients that were managed in the Federal Medical Centre, Yenagoa, giving a case incidence rate of 74 per 10,000 (7.4 per 1,000) pregnancies, which is 0.74% of all pregnancies. The mean age of the women was 30.4 years with a standard deviation of 3.9 years, and the modal age group was 26 – 30 years (58.8%). Most of the women were married (94.1%), with secondary level of education (73.5%). None of the women had tertiary education (Table 1).

Table 1. Sociodemographic characteristics of the women

Characteristics	Frequency (N = 34)	Percentage (%)
Age group		
≤ 25 years	3	8.8
26 - 30 years	20	58.8
31 - 35 years	7	20.6
> 35 years	4	11.8
Mean Age ± SD in years	**30.4 ± 3.9**	
Marital Status		
Single	2	5.9
Married	32	94.1
Level of Education		
None	3	8.8
Primary	6	17.6
Secondary	25	73.5
Occupation		
Trader	15	44.1
Farmer	4	11.8
Artisan	5	14.7
Unemployed	10	29.4

3.2 Obstetric Features, among Parturients with Uterine Rupture

Table 2 revealed that majority (79.4%) of the women were multiparous, and referred (94.1%) from traditional birth attendant (TBA) homes. All the pregnancies were term, unbooked for antenatal care, and more than half (55.9%) went into labour at 38 weeks' gestation.

3.3 Predisposing Factors, Clinical Presentation, Site of Rupture

Majority (76.5%) of the women had previous Caesarean section, and had uterine rupture at TBAs where they had multiple rigorous abdominal massages. All the women with uterine rupture in the period under review presented with abdominal pain. Other presenting features were intrauterine foetal death (82.4%), postpartum haemorrhage (26.5%), and shock (17.6%). Most rupture occurred at the lower anterior segment of the uterus. (Table 3).

3.4 Management and Outcome of Ruptured Uterus

Fourteen (41.2%) women had uterine repair done, while 5 of them (14.7%) had subtotal hysterectomy). Most (91.2%) of the women had blood transfusion; with 17(54.8%). Of the women needing 3 or more units of blood. There were 3 cases of maternal mortality, giving a case fatality rate of 8.8% in the period under review. There were 28 (82.4%) cases of perinatal mortality, 3 of the neonates that survived were resuscitated by the neonatologist, and managed in the special care baby unit (SCBU) of the hospital). Mean duration of hospital stay for these women was 9.5 days with a standard deviation of 5.4 days, as shown in Table 4.

4. DISCUSSION

Uterine rupture is a rare, but catastrophic and potentially life-threatening obstetric complication with increased risk of severe maternal and perinatal morbidity and mortality. The incidence has been reported in previous studies to range between 0.3 – 7 per 1,000 deliveries, with the highest rates occurring in the third world [11,12,13]. This is similar to the findings in this study which showed an incidence rate of 7.4 per 1,000 deliveries. This study was carried out in South-South Nigeria where the activities of traditional birth attendants (TBAs) are widespread. Hence, the high incidence of uterine rupture is not a surprise.

The most common predisposing factors for uterine rupture as documented in previous studies include, multiparity, scarred uterus, injudicious use of oxytocics, obstructed labour, foetal macrosomia, malpresentation and others [14,15,16]. In this study however, the commonest predisposing factor identified is the antenatal booking status of the woman with the unbooked status responsible for 100% of the cases of uterine rupture. This is closely followed by labour

Table 2. Obstetric features among the women

Characteristics	Frequency (N = 34)	Percentage (%)
Parity		
Nulliparous	1	2.9
Primiparous	2	5.9
Multiparous	27	79.4
Grand multiparous	4	11.8
Median parity (Range)	**2 (0 – 9)**	
Booking status		
Unbooked	34	100.0
Gestational age at onset of labour		
37 weeks	1	2.9
38 weeks	19	55.9
39 weeks	6	17.6
40 weeks	5	14.7
41 weeks	3	8.8
Referring Centre		
TBA homes	32	94.1
Health Centre	2	5.9

Table 3. Predisposing factors, clinical presentation and sites of rupture among the women with uterine rupture

Characteristics	Frequency (N = 34)	Percentage (%)
Predisposing factor*		
Previous Caesarean section	26	76.5
Injudicious use of oxytocics	15	44.1
Obstructed labour	8	23.5
Abdominal massage	32	94.1
Clinical presentation*		
Abdominal pain	34	100.0
Post-partum haemorrhage	9	26.5
Intra uterine foetal death	28	82.4
Maternal shock	6	17.6
Site of rupture*		
Lower anterior segment	27	79.4
Lower posterior segment	17	50.0

**More than one option applies*

Table 4. Management and outcomes of uterine rupture among parturients

Characteristics	Frequency (N = 34)	Percentage (%)
Intervention		
Repair alone	14	41.2
Repair + Bilateral tubal ligation	12	35.3
Subtotal Hysterectomy	5	14.7
Blood transfusion		
Transfusion	31	91.2
No Transfusion	3	8.8
Number of units transfused	**N = 31**	
2 units	14	45.2
3 units	6	19.4
4 units	8	25.8
6 units	3	9.7
Maternal Outcome		
Alive	31	91.2
Dead	3	8.8
Foetal Outcome		
Alive and well	3	8.8
Alive, but admitted into the SCBU	3	8.8
Perinatal mortality	28	82.4
Mean duration of hospital stay of the women ± SD in days	9.5 ± 5.4	

SCBU = special care baby unit

being monitored at a TBA's place (94%) where several abdominal massages are usually performed on the parturients. These risk factors are quite peculiar to the environment where this study was conducted. Generally, poor socioeconomic status, poor health seeking behaviour, aversion to Caesarean section and strong traditional beliefs and practices such as abdominal massages and delivery at a TBA's place plague the women in this region hence the reason for the above findings. Previous studies in this Centre have revealed that unbooked status and labour monitored at TBAs contribute significantly to poor perinatal and maternal outcome [17,18,19]. Other risk factors observed in this study are in keeping with previous findings such as multiparity (79%), previous scar (76%), injudicious use of oxytocics (44.1%), obstructed labour (23%) and others.

The commonest site of uterine rupture as documented in previous studies is the lower anterior segment of the uterus followed by the lower posterior segment [11]. This is supported

by the findings in this study which showed that rupture involving the lower anterior segment was 79%, while lower posterior segment was 50%. This can be attributed to the fact that previous Caesarean section is one of the commonest predisposing factors to uterine rupture, especially now that Caesarean section rates are on the increase in many Centres. Furthermore, most Caesarean sections are lower segment Caesarean sections except in special circumstances. The Caesarean section rate in our Centre is 42.4%, largely due to unbooked patients presenting from TBA's and then private clinics [20].

The clinical presentations of uterine rupture may be non-specific. However, the following features have been documented in the literature with foetal distress being the most reliable presentation; while others are abdominal pain, intrauterine foetal death and postpartum haemorrhage [21,22]. In this study, the commonest presenting symptom was abdominal pain (100%), followed by intrauterine foetal death (IUFD, 82.4%) postpartum haemorrhage (26.5%) and maternal shock (17.6%). These findings are due to the fact that all the patients in this review were unbooked, and referred from a TBA's place to our Centre and these were the clinical findings at presentation. There were no records of intrapartum monitoring as regards to the foetal heart rate pattern prior to referral. However, for the few cases that presented with live fetuses (17.6%) most of them had foetal heart rate irregularities.

Early diagnosis and prompt treatment is essential in reducing the high rate of maternal and fetal morbidity and mortality associated with uterine rupture. Immediate resuscitation with intravenous fluids and blood transfusion as indicated and surgical intervention are life saving measures in the management of uterine rupture. The choice of surgical intervention usually depends on the site and extent of the rupture, the woman's parity/desire for future fertility, her haemodynamic status and the skill of the surgeon. Based on the above, the surgical options include repair alone, repair plus bilateral tubal ligation (+ BTL) or hysterectomy [23,24]. in this study 91.2% of the patients received blood transfusions, 41.2% had repair alone, 35.3% had repair + BTL while 5% had subtotal hysterectomy. It is important to note that repair of ruptured uterus increases the possibility of recurrence of rupture in subsequent pregnancies, with reported incidence of 4.319% [25,26]. Therefore, elective repeat Caesarean delivery should be performed in this group of patients. Extensive counseling regarding future pregnancy and potentially associated complications should always be done with the patient.

Maternal outcomes reported in prior studies have shown a mortality rate ranging from 0 to 13%. This is in keeping with the mortality rate of 8.8% observed in this study. Delivery within 30 minutes of clinical suspicion of uterine rupture is associated with good long-term neonatal outcomes [10]. However, majority of our patients were unbooked and referred to us as emergencies after obstructed labour, uterine rupture or IUFD was suspected. The time delay between onset of rupture and delivery contributed to high foetal mortality rate demonstrated in our study.

A still birth rate of 82.4% was observed in this study as all recorded foetal deaths occurred prior to presentation at the hospital. Our finding was similar to the 86.3%, [27] 92% [8] and 93% [28] of foetal deaths reported in other studies conducted in Nigeria and also the 98.3% [29] reported in a tertiary hospital in Ethiopia. However, it differs from the still birth rate of 54.2% reported by Kahansim et al. [30] in Jos, North central Nigeria, probably due to the fact that all mothers in this study were unbooked cases. Overall, the high proportion of reported foetal deaths reported in this study and consistent with previous studies, is the occurrence of uterine rupture predominantly among unbooked multiparous mothers. In this Centre, unbooked status has consistently been associated with poor maternal and perinatal outcomes [17–20,31].

Uterine rupture is a major public health problem with the potential of causing devastating maternal and neonatal morbidity and mortality. Hence concerted effort should be aimed at behavioural change communication through continuous health education programmes for women and their spouses; through peer education, group engagement and culturally sensitive and acceptable strategies on the need to have antenatal care, and their deliveries in hospitals equipped with trained and skilled personnel to supervise pregnancy, labour and delivery. Hence, early diagnosis with prompt interventions by skilled healthcare providers, functional operating theatres, availability of a well-equipped Intensive Care Unit (ICU), Neonatal Intensive Care Unit (NICU) and a

functioning blood bank service, are preventive measures to improve maternal and foetal outcomes secondary to uterine rupture.

5. CONCLUSION

Uterine rupture is still a major public health problem in the developing countries with a high potential for causing perinatal and maternal morbidity and mortality. Thus, a high index of suspicion is required to make the diagnosis, especially when any of the predisposing factors is present. This can only be done when pregnant women are booked for antenatal care, and manged by skilled healthcare providers.

Behavioural change strategies should be employed in educating women and their spouse through peer education, group engagement and culturally sensitive and acceptable strategies on the need to attend antenatal clinics and have their deliveries in hospitals equipped with trained and skilled personnel to supervise pregnancy, labour and delivery. This would allow for proper antenatal evaluation and intrapartum monitoring.

There should also be a strong behaviour-change focused campaign to reduce the aversion for Caesarean section. Female education should be encouraged and supported as this gives the woman power over her economic status and thus strengthen her decision-making ability. Traditional birth attendants should be trained and re-trained on early warning signs and encouraged to practice prompt and early referral of parturients to tertiary centres for expert management.

6. LIMITATION

This study is limited by the fact that it is a single Centre hospital-based study. Therefore, may not reflect what is obtainable in the general population of pregnant women.

CONSENT

As per international standard or university standard, patients' written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

The research work was examined and approved by the hospital research and ethics committee. Ethical approval number: FMCY/REC/EAF/2021/JULY/491–1080.

ACKNOWLEDGEMENT

The authors appreciate the Medical Records of the hospital for making this research possible; and Dr. Adesina Adedotun Daniel for analysing the data for this study.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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Peer-review history:
The peer review history for this paper can be accessed here:
https://www.sdiarticle4.com/review-history/72476