



Original Article

Uterine Rupture: A Reappraisal of the Experience in a Tertiary Hospital in North Central Nigeria.

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Abstract

Introduction: Rupture of the gravid uterus is a major life-threatening obstetric emergency, which had remained a major public health problem in low resource countries of the world and in Africa in particular. Its occurrence is associated with a high incidence of fetomaternal morbidity and mortality which clearly unveils the poor obstetric care delivery and socioeconomic status in these countries. **Objectives:** This study was to reappraise the prevalence, aetiological risk factors, complications and fetomaternal outcomes of uterine rupture at the Federal Medical Centre, Keffi, Nasarawa State, North-Central Nigeria. **Materials and Methods:** A retrospective study of pregnant women with ruptured uterus managed at the Department of Obstetrics and Gynaecology of Federal Medical Centre, Keffi, from 1st January 2020 to 31st December 2022. Information on the age, parity, booking status, aetiology, place of intrapartum care, maternal complications and fetomaternal outcomes were extracted and analyzed using SPSS 25 version and the result was presented as frequencies and percentages using simple statistical tables. **Results:** The total number of deliveries was 3,398 and those with ruptured uterus were 23, giving a prevalence of 0.68% or 1 in 148 deliveries. The mean age of the women was 30.32 ± 1.15 years. The highest prevalence was among unbooked multiparous women (90.91%). Major risk factors were injudicious oxytocin use (50.0%) in unscarred uteri, obstructed labour (22.73%) and previous caesarean section scar (18.18%). Most of the ruptures were anteriorly sited (50.0%). Uterine Repair with bilateral tubal ligation was the commonest mode of treatment (50.0%), while hysterectomy was done (18.18%) for cases with extensive ruptures. The commonest complication was postoperative anaemia (36.36%). There were three maternal deaths, with a case fatality rate of 13.6%, while the perinatal mortality was 90.91%. **Conclusion:** The prevalence of ruptured uterus is still high in our facility with grave maternal and perinatal morbidity and mortality. Regrettably this catastrophe is highly preventable through measures like increased antenatal utilization, planned delivery of at-risk patient executed by skilled birth attendants, good referral system with well-equipped facilities. This quagmire can be reduced to the barest minimum.

Keywords: Uterine rupture: Morbidity: Maternal Mortality: Obstetric emergency: North Central

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Introduction

Rupture of the gravid uterus is one of the major life-threatening obstetric emergencies, which is associated with a high incidence of feto-maternal morbidity and mortality. It's a disaster that can occur during labour, delivery and to a lesser extent during pregnancy.^{1,2} It is relatively uncommon in developed countries with reported incidence ranging between 0.03% and 0.3%.³ However, this is still a public health problem in low income countries of the world and in Africa in particular, as this clearly unveils the poor obstetric care delivery and socioeconomic status in the region.^{1,4}

Ruptured uterus is defined as the total disruption of the wall of the pregnant uterus with or without extrusion of its contents either the baby or the placenta. Uterine rupture may be incomplete or complete. Complete is where rupture extends through all layers of the uterine wall and serosa. Complete rupture may be classified as traumatic or spontaneous.^{1,3} In Nigeria, incidence of 0.61%, 0.58%, 0.7%, 0.85% and 1.03% from Lagos, Benin, Keffi, Abuja and Okolobiri in Niger Delta respectively had been reported.^{5,6} A high Maternal case fatality and perinatal mortality rate of 10.3 - 16.0% and 70-90 % respectively had been reported.⁴ Rupture of a previous caesarean section scar is the commonest cause of uterine rupture in the developed world and previous lower segment scar carries a 0.25 - 0.5% risk of rupture, compared with a vertical (classical) scar where the risk of rupture is 3 - 4%.^{2,4}

Predisposing factors to ruptured uterus are obstructed labour, grand multi-parity, uterine hyperstimulation with oxytocics, previously scarred uterus, excessive uterine curettage, intrauterine manipulations during labour and delivery (such as internal podalic version, breech extraction and manual removal of retained placenta), operative vaginal delivery, congenitally malformed uterus with pregnancy especially in an undeveloped uterine horn, placental accreta syndrome.²⁻⁴ In developing countries where obstetric services are either poor or nonexistent, the majority of uterine rupture occurs in the unscarred uterus as a sequelae of neglected obstructed and/or prolonged labour, unskilled delivery and also following misuse of oxytocics.^{7,8}

Other factors are unbooked status, ignorance, poverty, illiteracy, reliance on faith homes/traditional birth attendants, reduced skilled workforce (JAPA syndrome), poor medical facilities, poor referral system and dwindling health care funding and aversion for operative deliveries.²⁻⁴ Presentations of ruptured uterus depends on the timing, site and extent of rupture. The immediate maternal complications are

hypovolemic shock, infection, and death. The principles of management of ruptured uterus used to be in agreement with the forceful statement of Etienne Tarnier at the Paris congress of Obstetrician in 1897 where he declared that: "If a woman in the battle to reproduce her kind has ruptured her uterus, she should be invalidated from the service, for it is not with cripple that an army takes the field". His statement was that this can't be improved upon.⁹ But in recent times, due to advances in health care, availability of antibiotics, blood and blood products, this statement can be improved upon.

Once diagnosis is made management is as follows: intensive resuscitation, emergency laparotomy, broad spectrum antibiotics, and adequate post-operative care. The surgical team should be made up of an experienced obstetrician, anaesthetist, haematologist and mid-wives.^{1,9} However, patients' needs to be individualized and the choice of surgery in each case is one that is the shortest and gets the patient off the operating table in the best condition. Hysterectomy (total or subtotal) is indicated when there is extensive damage to the uterus or there is an inaccessible posterior rupture.^{10,11}

The complications of ruptured uterus are thrombophlebitis, ureteric injuries, amniotic fluid embolism, disseminated intravascular coagulation, postoperative infection, pituitary failure, maternal and fetal death.¹² Most cases of uterine rupture can be prevented with good Obstetric care which involves girl child education, women empowerment, discouraging child marriage, good nutrition, supervised delivery, immunization, screening of high risk patients, prevention of prolonged labour and discouraging injudicious use of oxytocics.^{12,13} In this study, we aimed at reappraising the current prevalence of ruptured uterus in our centre, associated risk factors and its contribution to maternal and perinatal morbidity and mortality.

Material and Methods

Study area

The study was conducted at the Department of Obstetrics and Gynaecology, Federal Medical Center, Keffi, North Central, Nigeria. The research study was conducted from 1st January 2020 to 31st December 2022. The centre has an average of 1200 deliveries per annum, which includes vaginal deliveries and various categories of caesarean sections.

Study population/design

This study was a retrospective study involving all pregnant women with ruptured uterus managed at the

department of Obstetrics and Gynaecology of Federal Medical Centre, Keffi, North Central Nigeria from 1st January 2020 to 31st December 2022.

Data collection

Information of all the pregnant women with ruptured uterus managed in our facility during the period under review was retrieved from the health information management unit, obstetric registers in the labor ward, the postnatal ward and the special baby care unit (SCBU). Using a proforma, information on the age, parity, booking status, place of intrapartum care, aetiological risk factors, birth weight, estimated blood loss, units of blood transfused, maternal complications and feto-maternal outcomes were all documented.

Data analysis

Data were sorted and analyzed using SPSS 25 version. The descriptive analysis of the patients' sociodemographic characteristics was presented in tables as frequency, proportions, and means.

Result

During the period under review, a total of 3,398 deliveries were conducted and a total of 23 cases of ruptured uterus were treated, giving a prevalence of 0.68% or 1: 148 deliveries. Of the 23 cases, 22 case folders were retrieved and analyzed giving a retrieval rate of 95.7%. The mean age \pm SD of the women was 30.32 ± 1.15 years. The modal age group was 30–39 years (12, 54.55%). Most of the women 10(45.45%) had no formal education, 8(36.36%) were unemployed, 14(63.64%) were Christians and all the women were married. Only 2(9.09%) of the 22 women were booked. Half of the women that had uterine rupture were multiparous. [Table 1]

Majority of the women presented with abdominal pain 9(40.91%) while the least presentation was shock accounting for 2(9.09%). Injudicious oxytocin use was the leading single aetiological risk factor accounting for 11(50.00%) halves of the cases of uterine rupture managed. This was followed by obstructed labour 5(22.73%) and previous CS scar accounting for 4 (18.18%). Most of the cases were referred from the primary health centres and general hospitals accounting for 8(36.36%) and 7(31.82%) respectively. Only 1(4.55%) case of rupture occurred in our centre. Half of uterine rupture were located on the anterior uterine wall 11(50.00%) followed by scar dehiscence 4(18.18), while anterior rupture with lateral extension ranked least accounting for 1(4.55%). Over half of the patients 12(54.55%) had an estimated blood loss of 1001-2000mls with 2 units of blood transfused

Table 1: Sociodemographic of Women with Ruptured Uterus

Characteristic	Frequency (N=22)	%	Mean \pm SD	
30.32 ± 1.15				
Age	<20	0	0.00	
	20-24	1	4.55	
	25-29	7	31.82	
	30-34	8	36.36	
	35-39	5	22.73	
	≥ 40	1	4.55	
	Total	22	100	
Level of education	No Formal Education	10	45.45	
	Primary	6	27.27	
	Secondary	3	13.64	
	Tertiary	3	13.64	
	Total	22	100	
Occupation	Artisan	3	13.64	
	Business Woman	1	4.55	
	Civil Servant	3	13.64	
	Farmer	6	27.27	
	Trader	1	4.55	
	Unemployed	8	36.36	
	Total	22	100	
	Religion	Christianity	14	63.64
		Islam	8	36.36
Total		22	100	
Booking status	Booked	2	9.09	
	Unbooked	20	90.91	
	Total	22	100	
Parity	Nullipara	1	4.55	
	Primipara	3	13.64	
	Multipara	11	50.00	
	Grand multipara	7	31.82	
	Total	22	100	

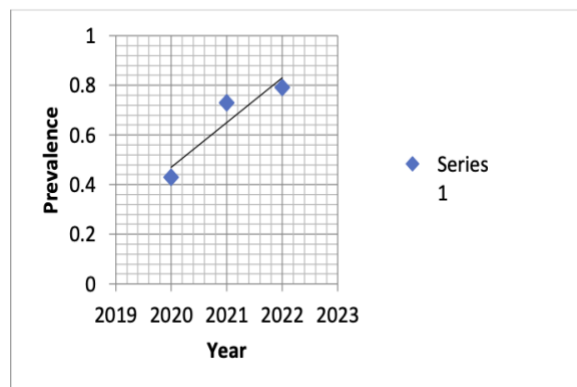


Fig1: Yearly Prevalence 2020-2022

accounting for 7(31.82%). [Table 2] Birth weights of babies delivered ranged between 2.5 -4.2kg with a mean of 3.62 ± 0.10 . Most of the babies delivered were average weight 2.5-3.9kg accounting for 17(77.27%). A larger number of the women survived the rupture accounting for 19(86.36%) in sharp contrast to most of

Table 2: Aetiological Risk Factors/ Management of Women with Rupture Uterus

Characteristic	Frequency (N=22)	%	Mean± SD	
Clinical presentation	Abdominal Pain	9	40.91	
	Shock	2	9.09	
	Shock/ Abdominal Pain/ Vaginal Bleeding	4	18.18	
	Vaginal Bleeding	7	31.82	
	Total	22	100	
Risk factors	Injudicious Oxytocin Use	11	50.00	
	No Identifiable Risk Factor	1	4.55	
	Previous CS Scar	4	18.18	
	Obstructed Labour	5	22.73	
	Uterine Manipulation	1	4.55	
	Total	22	100	
Place of management	FMCK	1	4.55	
	General hospital	7	31.82	
	Home/ TBA	4	18.18	
	PHC	8	36.36	
	Private/ Mission Hospital	2	9.09	
Total	22	100		
Type of rupture	Anterior and posterior uterine wall	2	13.64	
	Anterior wall	11	50.00	
	Anterior with lateral extension	1	4.55	
	Posterior wall	2	9.09	
	Posterior wall with lateral extension	2	9.09	
	Scar dehiscence	4	18.18	
	Total	22	100	
Type of surgical intervention	Subtotal Hysterectomy	2	9.09	
	Total Hysterectomy	2	9.09	
	Uterine repair alone	7	31.82	
	Uterine repair with BTL	11	50.00	
Total	22	100		
Estimated blood loss (mls)	500 - 1000	6	27.27	
	1001 - 2000	12	54.55	
	>2001	4	18.18	
	Total	22	100	
Units of blood transfused	2	7	31.82	3.45 ± 0.30
	3	5	22.73	
	4	6	27.27	
	≥5	4	18.18	
	Total	22	100	

Table 3: Feto-Maternal Outcomes

Characteristic	Frequency (N=22)	%	Mean± SD
Birth weight (Kg)	2.5 - 3.9	17	77.27
	≥4	5	22.73
	Total	22	100
Maternal outcome	Alive	19	86.36
	Dead	3	13.64
	Total	22	100
Fetal outcome	Alive	2	9.09
	Dead	20	90.91
	Total	22	100

the fetuses that were born as fresh stillbirths 20(90.91%). In this study the case fatality, perinatal death rate and maternal mortality ratio are 13.6%, 90.91% and 88.3/100,000 women respectively. [Table 3] The commonest intra operative complication was intra operative broad ligament haematoma accounting for 5(22.73%), while the commonest post operative complication in the study was post operative anaemia accounting for 8(36.36%). [Table 4]

Discussion

The prevalence of uterine rupture varies globally from one obstetric population to the other and it's a reflection of the level of obstetric care and utilization of such facilities.² The prevalence of rupture uterus in this study was 0.68% or 1: 148 deliveries which was higher than reported prevalence from Lagos and Benin but lower than a previous prevalence of 0.7% reported from our centre, 0.85% from Abuja, 1.03% from Delta and 0.84% Guinea.^{5,6,14} These prevalence values are far much higher than the reported prevalence of 0.015 % - 0.01% in developed countries.^{2,15,16} The yearly trend of the prevalence of uterine rupture in our centre showed an initial decline of 0.43% (1 in 234) in 2020 from the previously reported prevalence of 0.5%(1 in 199) in 2017 before the sharp increase of 0.73%(1 in 137) in 2021 and 0.79%(1 in 126) in 2022. A possible reason for the decline observed in 2020 was because our centre started sending out resident on rural posting to facilities in areas noted as hot spots.

Secondly, the state Government in its wisdom employed more skilled personnel (Doctors and Nurse) to health facilities across the state. However, this was short lived as the health facilities across the state, our centre inclusive had witnessed the massive exodus of health care personnel to developed countries in search of better remuneration and working conditions (JAPA SYNDROME). Another reason is the recent hike in the prices of medical services in our health facilities, which is far from the reach of an average patient thus, making them to resolve to alternatives plans for deliveries (Home, TBA, Faith houses etc).¹⁷ This is aside the issues of late presentation/ referral to our facility, illiteracy, poor supply of medical equipment and dwindling health care funding.³ This is in contrast with what is obtainable in developed countries where good maternity care services exist.¹⁴ The highest frequency of rupture uterus in our study was found in the age group 30 - 34 years, among multiparous women and these findings were similar to findings from several studies^{5,6} but at variance with findings from some studies where ruptured uterus was more common among the grand multiparas.^{3,4} This is

because increasing maternal age and parity causes decrease tensile strength of the uterus.² Most of the patients with uterine rupture in our study were unbooked. This is similar to reports from studies done across Nigeria.³⁻⁶

This reflects the poor antenatal care utilization in the country, which can be improved through adequate public health education, proper counseling and free or subsidized antenatal care services. Abdominal pain and vaginal bleeding were the leading presenting complaint in our study, and this was similar to findings reported in Lagos and Asaba.^{5,7} Most cases of uterine rupture occurred from combination of risk factors. However, the commonest single identifiable risk factor in our study was injudicious use of oxytocin, followed by obstructed labour and previous caesarean sections. This finding was similar to the findings reported in some studies from Bauchi, Kastina, Keffi.³⁻⁶ However, it was a sharp contrast to the finding reported from Asaba, some developed countries and Benin, where previous caesarean section was the single most identified risk factor.^{5,18,19} Rupture of the anterior uterine wall was the commonest, which was in keeping with similar studies in many part of the world.^{1-10,15,20} There is a close association between ruptured uterus and illiteracy, poverty, aversion for caesarean, delayed / poor referral system and injudicious use of oxytocin.

The treatment for patients with ruptured uterus should be individualized and dependent on the patient's clinical state, site, extent of the rupture, experience of the surgeon, future reproductive wish, socio-cultural peculiarity of the area of practice.^{2,4-6,21} Uterine repair with bilateral tubal ligation was the commonest mode of surgical treatment in our study, followed by uterine repair alone while hysterectomy (total/subtotal) ranked least. This is the widely reported trend in most studies done in Nigeria.^{1-4,6-8,19-22} Indications for hysterectomies were multiple and or extensive ruptures as reported in other similar studies.^{3,19-22}

The commonest maternal morbidity was anaemia from haemorrhage with the average blood loss from this study estimated as 1709mls. This was followed by sepsis. This finding was similar to reported findings from some studies where anaemia was the commonest morbidity found in about 38% of the patients.^{6,20,22} The case fatality in our study was 13.6%, which was higher than the 2.7% previously reported from our centre, 6.3% by Oguejiofor et al and 4.8% reported by Lawal et al. However, this finding was lower than 21.3% and 21.43% reported by Ezechi et al and Elkady et al.^{17,23} The difference in the rate could be as a result of differences in the durations of the studies. Most of the patients had multiple units of blood

transfusion. This had been reported in most studies.²⁻⁶ Ruptured uterus is usually associated with poor fetal outcome. In our study, the perinatal mortality was 90.91%, which is similar reported findings from other studies with rates as high as 75-92%.^{1-6,20-24} Increased antenatal utilization, planned delivery carried out by skilled birth attendants, early diagnosis and timely intervention will reduce this ugly rate.^{2,3,20}

Conclusion

The incidence of ruptured uterus in our facility is still high and it's due to injudicious use of oxytocics, obstructed labour and increase in the cost of medical services among others. This study therefore bring to the front burner the need to address some pertinent issues like increase public awareness on the gains of antenatal care, free or subsidized antenatal care services, optimizing staff strength, provision of enabling working environments with better remuneration (to prevent the JAPA syndrome), discouraging injudicious use of oxytocin, training and retraining of midwives, community extension health workers and in some cases traditional birth attendants on the identification and early referral of at-risk pregnancies to the next level of care. These important preventive strategies will surely reduce significantly morbidity and mortality from this quagmire called uterine rupture, which is claiming the precious lives of our pregnant women.

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Ethical approval

The ethical approval for the conduct of this research was obtained from the ethical committee of Federal Medical Centre Keffi.

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Conflict of interest

Authors did not declare any conflict of interest.

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