

PERINATAL CRISIS: UTERINE RUPTURE TRENDS AND OUTCOMES AT A NIGERIAN TERTIARY HOSPITAL (2012-2015)

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ABSTRACT

Uterine rupture remains a life-threatening obstetric emergency with significant maternal and perinatal consequences. Despite declining incidence in high-income countries (0.02–0.04%), rates remain unacceptably high in resource-limited settings like Nigeria. This study aimed to determine the incidence, risk factors, management patterns, and outcomes of uterine rupture at a tertiary hospital in Bauchi, Nigeria, between 2012 and 2015.

A retrospective review was conducted on 94 confirmed cases of uterine rupture among 13,476 deliveries, yielding an incidence of 0.8% (1 in 125 deliveries). Most affected women were aged 26–30 years (34.0%), uneducated (74.5%), and grandmultiparous (52.1%). Obstructed labor (55.3%), grandmultiparity (48.9%), and oxytocin misuse (34.0%) were the predominant risk factors. The majority of ruptures occurred in the lower uterine segment (61.7%), with uterine repair plus tubal ligation being the most common surgical intervention (63.8%). Maternal mortality was relatively low (4.3%), but perinatal mortality was extremely high (91.5%). Common complications included anemia (40.0%) and prolonged hospitalization (30.9%).

These findings reflect persistent systemic gaps in intrapartum care, including poor labor monitoring and limited access to emergency obstetric services. Urgent improvements in skilled birth attendance, oxytocin regulation, and functional referral systems are essential to reducing the burden of uterine rupture in similar low-resource settings.

Keywords: Uterine rupture, maternal mortality, perinatal mortality, obstructed labor, Nigeria

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BACKGROUND

Uterine rupture is a rare but disastrous obstetric emergency characterized by a full-thickness disruption of the uterine wall, which may lead to the expulsion of the fetus into the peritoneal cavity.¹ It poses significant risks to both mother and fetus, including severe hemorrhage, hysterectomy, fetal hypoxia, and death.² While the global incidence of uterine rupture has declined in high-resource settings due to advancements

in obstetric care, its occurrence remains a critical concern, especially in populations with high rates of cesarean delivery, limited access to emergency obstetric services, and inconsistent monitoring during labor.^{3,4}

In high-income countries such as the United States, uterine rupture is uncommon but not negligible. A comprehensive analysis of 7,922,016 births occurring in the United States between 2011 and 2012 identified

1,925 cases of uterine rupture, yielding a baseline incidence of 2.4 per 10,000 births.⁵ The risk was found to be significantly higher in women with a history of previous cesarean delivery, at 8.9 per 10,000 births, compared to 1.8 per 10,000 births among women without such history, and identified chorioamnionitis, previous cesarean section, and pregestational diabetes as the strongest independent predictors of uterine rupture. Notably, in high-risk women with multiple risk factors, the absolute risk of uterine rupture increased dramatically—from a baseline of 2.4 to as high as 189.2 per 10,000 births—stressing the critical need for careful risk stratification and labor management in such populations.

In contrast, the burden of uterine rupture is markedly higher in low- and middle-income countries, particularly in sub-Saharan Africa, where systemic healthcare limitations contribute to delayed diagnosis and poor outcomes. Across African countries,

incidence rates range from 0.2% to 2.6%, significantly higher than rates reported in high-income nations.^{6,7,8} A meta-analysis of thirteen studies conducted in Ethiopia estimated the pooled prevalence of uterine rupture at 2% (95% CI: 1.99–3.01), with regional variations as high as 5% in the Amhara region.⁷ Factors contributing to this high burden include grand multiparity, obstructed labor, the inappropriate use of uterotonic agents, poor antenatal care coverage, and delays in accessing emergency obstetric interventions.^{9,10}

In Nigeria, uterine rupture remains a significant contributor to maternal and perinatal mortality and reflects persistent gaps in obstetric care delivery. Reported incidence rates in Nigerian tertiary hospitals range from 0.4% to 2.5%.^{3,8,11} Commonly implicated risk factors in the Nigerian context include grand multiparity, mismanaged labor (especially with unsupervised oxytocin use), prolonged obstructed labor, previous uterine

surgery, and systemic delays in emergency response.^{11,12} The socio-economic context—marked by poverty, low female education, and limited transportation infrastructure—further exacerbates these risks. Despite the introduction of maternal health initiatives such as the National Health Insurance Scheme and targeted interventions to improve skilled birth attendance, the incidence and fatality rates associated with

MATERIALS AND METHODS

Study Area

This study was conducted at Abubakar Tafawa Balewa University Teaching Hospital (ATBUTH), a tertiary referral center located in Bauchi, northeastern Nigeria. The hospital serves as a major referral institution for Bauchi State and its environs, providing comprehensive obstetric and gynecological services. The Obstetrics and Gynaecology department is staffed with specialists and offers emergency obstetric care, operative

uterine rupture in Nigeria remain unacceptably high.

Overall, while uterine rupture is relatively rare on a global scale, it continues to pose a major public health challenge in resource-limited settings. Its occurrence often signals failures in the continuum of obstetric care, particularly in the context of trial of labor after cesarean delivery, poorly monitored labor, and delayed emergency response.

deliveries, and critical maternal care services, making it a suitable site for this study.

Study Design and Selection Criteria

This was a retrospective descriptive study covering a four-year period from January 1, 2012, to December 31, 2015. The study included all women who were diagnosed and managed for uterine rupture within the study period at ATBUTH. Inclusion criteria were patients with clinically and/or surgically confirmed uterine rupture, irrespective of gestational age or parity, and with complete

medical records. Exclusion criteria included cases with incomplete documentation, uncertain diagnosis, uterine dehiscence, or ruptures managed outside the defined study period.

Data Collection

Data were obtained retrospectively from the labor ward and theatre registers, which were used to identify cases of uterine rupture managed at ATBUTH between January 2012 and December 2015. Corresponding case files were retrieved from the medical records department. Extracted information included patients' age, parity, booking status, place of delivery, identified risk factors, type of rupture, mode of management, and maternal and fetal outcomes. All data were reviewed for completeness and accuracy prior to analysis.

Data Analysis

Collected data were coded and entered into a spreadsheet for analysis using SPSS 25. Descriptive statistics were used to summarize

the findings. Frequencies and percentages were calculated for relevant variables including demographic characteristics, risk factors, clinical presentations, modes of management, and outcomes.

Ethical Considerations

Ethical clearance was obtained from the Research and Ethics Committee of Abubakar Tafawa Balewa University Teaching Hospital. As a retrospective review, patient consent was not required, but confidentiality was strictly maintained by anonymizing identifiable information in all data handling and reporting.

RESULTS

During the study period, a total of 13,476 deliveries were recorded, with 108 cases of uterine rupture managed, resulting in an incidence ratio of approximately 1 case per 125 deliveries, giving a prevalence of 0.8%. Of these 108 cases, 94 medical records were successfully retrieved, yielding a retrieval rate of 87%.

Table 1: Demographic Profile of the Patients

Variable	Frequency (n=94)	Percentage (%)
Age		
16-20	12	12.8
21-25	16	17.0
26-30	32	34.0
31-35	22	23.4
36-40	12	12.8
Marital Status		
Married	92	97.9
Single	2	2.1
Educational Level		
None	70	74.5
Primary/Arabic School	14	14.9
Secondary	8	8.5
Tertiary	2	2.1
Parity		
1	19	20.2
2	4	4.3
3	7	7.4
4	15	16.0
≥5	49	52.1
Booking Status		
Booked	4	4.3
Unbooked	34	36.2
Booked Elsewhere	56	59.5

Table 1 shows a total of 94 cases of uterine rupture were analyzed. The highest occurrence was among women aged 26–30 years, 32 (34.0%), followed by those aged 31–35 years, 22 (23.4%). The 16–20 and 36–40-year age groups each accounted for 12 (12.8%) cases, while 21–25 years made up 16 (17.0%). Most of the women were married, 92 (97.9%), with only 2 (2.1%) single. Educational attainment was low, as 70 (74.5%) had no formal education, 14 (14.9%)

had primary or Arabic education, 8 (8.5%) had secondary education, and only 2 (2.1%) attained tertiary education.

High parity (≥ 5) was common, seen in 49 (52.1%) of cases. Parity 1 was recorded in 19 (20.2%), parity 4 in 15 (16.0%), parity 3 in 7 (7.4%), and parity 2 in 4 (4.3%). Regarding antenatal care, only 4 (4.3%) were booked at the study facility, 56 (59.5%) were booked elsewhere, and 34 (36.2%) were unbooked.

Table 2: Risk Factor and Site of Uterine Rupture

Factor	Frequency (n=94)	Percentage (%)
Risk Factor		
Prolonged Obstructed Labour	52	55.3
Grandmultiparity	46	48.9
Injudicious Oxytocin Usage	32	34.0
Previous Caeserean Delivery	26	27.7
Abnormal lie/Presentations	14	14.9
Trauma	5	5.3
Site of Rupture		
Lower Segment	58	61.7
Upper Segment	18	20.2
Posterior Wall	12	11.7
Anterior and Posterior Walls	6	6.4

Table 2 shows that prolonged obstructed labour was the most common predisposing factor, observed in 52 cases (55.3%). Grandmultiparity was also frequently implicated, accounting for 46 cases (48.9%). Injudicious use of oxytocin was identified in 32 cases (34.0%), while a history of previous caesarean delivery was present in 26 cases (27.7%). Abnormal lie or fetal presentations were recorded in 14 cases (14.9%), and

uterine trauma was noted in 5 cases (5.3%). The site of uterine rupture was predominantly the lower segment, occurring in 58 cases (61.7%). Ruptures involving the upper segment were observed in 18 cases (20.2%). The posterior uterine wall was affected in 12 cases (11.7%), while simultaneous involvement of both anterior and posterior walls was noted in 6 cases (6.4%).

Table 3: Place Of Intrapartum Care and Types of Surgical Repair

Characteristic	Frequency (n=91)	Percentage (%)
Place of Intrapartum Care		
Primary Health Care Centres	36	38.2
Home Delivery	34	36.2
General Hospital	16	17.0
Teaching Hospital	4	4.3
Private Hospitals	4	4.3
Type Of Surgical Repair		
Repair with Bilateral Tubal Ligation	60	63.8
Uterine repair Only	22	23.4
Sub-Total Hysterectomy	10	10.6
Total Abdominal Hysterectomy	2	2.2

Table 3 shows that regarding the place of intrapartum care, the majority of patients

received care at primary health care centres, accounting for 36 cases (38.2%). Home

deliveries were also common, with 34 cases (36.2%) occurring outside formal health facilities. Care at general hospitals was documented in 16 cases (17.0%), while only a minority of patients delivered at teaching hospitals and private hospitals, each representing 4 cases (4.3%).

The predominant intervention was uterine repair combined with bilateral tubal ligation, performed in 60 cases (63.8%). Uterine repair alone was carried out in 22 cases (23.4%). More extensive surgical procedures included sub-total hysterectomy in 10 cases (10.6%) and total abdominal hysterectomy in 2 cases (2.2%).

Table 4: Distributions of Both Maternal and Fetal Outcomes

	Fetuses n=94 (%)	Mothers n=94 (%)
Outcome		
Alive	8 (8.5%)	90 (95.7%)
Dead	86 (91.5%)	4 (4.3%)

Table 4 shows that among the 94 cases of uterine rupture, the majority of mothers survived, with 90 (95.7%) alive at the conclusion of the study period, while 4

(4.3%) died. In contrast, fetal outcomes were markedly poorer, with only 8 fetuses (8.5%) surviving and 86 (91.5%) resulting in perinatal death.

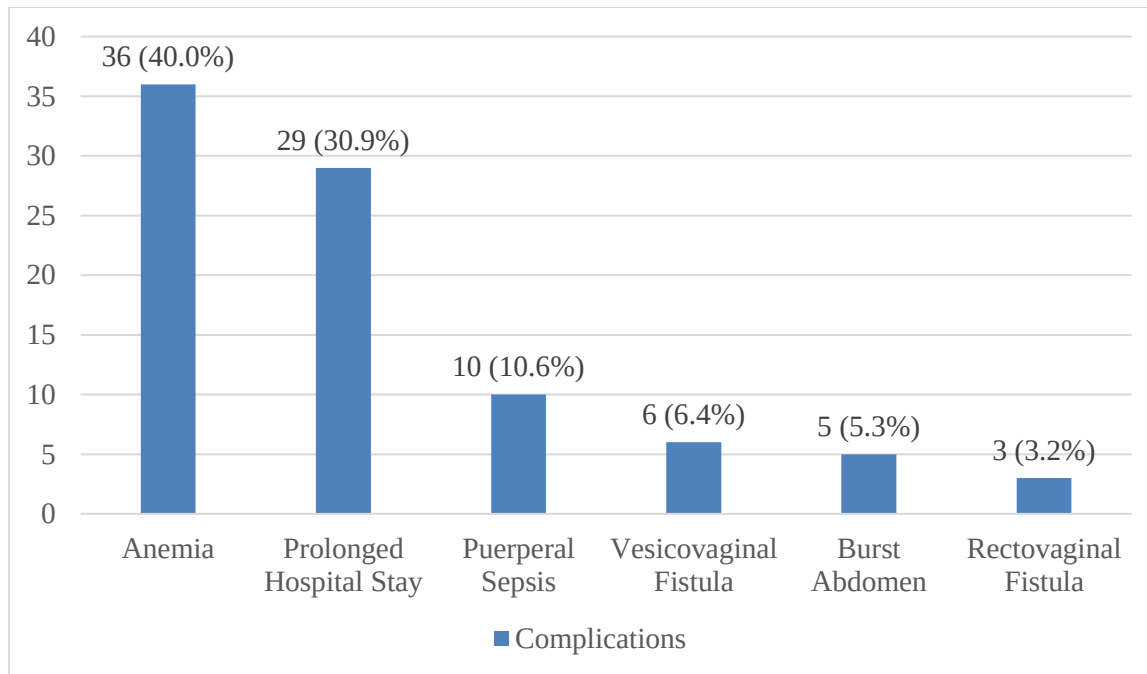


Figure 1: Complications among respondents

Figure 1 shows that among the 91 cases reviewed, anemia was the most common complication, occurring in 36 patients (40.0%). Prolonged hospital stay was noted in 29 cases (30.9%), while puerperal sepsis

developed in 10 patients (10.6%). Other notable complications included vesicovaginal fistula in 6 cases (6.4%), burst abdomen in 5 cases (5.3%), and rectovaginal fistula in 3 cases (3.2%).

DISCUSSION

The findings of this study reveal a high incidence regarding uterine rupture of 1 in 125 deliveries (0.8%) at Abubakar Tafawa Balewa University Teaching Hospital (ATBUTH) between 2012 and 2015. This rate is substantially higher than those reported in high-income countries, where uterine rupture occurs in approximately 1 in 1,000 to 2,000 deliveries^{13,14}, but aligns with findings from a similar study conducted in another low-resource setting such as Ethiopia in 2024, which documented an incidence of 1 in 218 deliveries or 0.5%¹⁵. The disparity can likely be attributed to differences in healthcare infrastructure, access to skilled birth attendants, and delays in obstetric interventions in resource-limited regions. The high incidence observed in this study highlights the persistent challenges in maternal healthcare delivery in northeastern Nigeria, where limited access to emergency obstetric care and a high prevalence of

unbooked pregnancies contribute to adverse outcomes.

The sociodemographic profile of the affected women indicates that uterine rupture was most common among women aged 26–30 years, followed by those aged 31–35. This contrasts with studies from more developed settings, where older maternal age is often associated with higher obstetric risks, including uterine rupture^{16,17}. The predominance of cases in younger women in this study may reflect early and high fertility patterns in the region, compounded by limited access to family planning services. Additionally, the majority of women in this study had no formal education (74.5%) and were of high parity (52.1% had five or more previous deliveries), factors that have been consistently linked to poor maternal health-seeking behavior and increased obstetric risk, as seen in similar studies conducted in Rivers and Zamfara states^{11,18}. The low proportion of women who received antenatal care at the

study facility (4.3%) further highlights gaps in maternal healthcare utilization, which may contribute to undetected risk factors and delayed management of labor complications. Prolonged obstructed labor emerged as the leading risk factor for uterine rupture (55.3%), followed by grandmultiparity (48.9%) and injudicious use of oxytocin (34.0%). These findings are consistent with previous studies in other LMIC's, where obstructed labor, multiparity and poor oxytocin usage remains a major contributor to uterine rupture due to inadequate monitoring of labor and limited availability of emergency cesarean sections^{19,20}. The high rate of oxytocin misuse suggests a lack of standardized protocols for labor augmentation in peripheral health facilities, where untrained personnel may administer the drug without proper indication or monitoring. Comparatively, in high-resource settings, uterine rupture is more often associated with scarred uterus, commonly

seen in myomectomies and previous cesarean sections^{21,22}, whereas in this study, only 27.7% of cases had a history of cesarean delivery. This difference may reflect variations in obstetric practices, with vaginal deliveries being more common in low-resource settings despite known risks.

The site of uterine rupture was predominantly the lower uterine segment (61.7%), which aligns with existing literature indicating that this area is most vulnerable during labor, particularly in cases of cephalopelvic disproportion and previous caesarean sections, where the tear may occur along the previous line of incision^{23,24}. However, a notable proportion of ruptures occurred in the upper segment (20.2%), which is less common and may suggest severe, unmanaged labor dystocia or traumatic obstetric maneuvers. The high frequency of home deliveries (36.2%) and births at primary healthcare centers (38.2%) further emphasizes the need for improved referral

systems and capacity-building at lower-level facilities to recognize and manage obstructed labor before complications arise.

Surgical management predominantly involved uterine repair with bilateral tubal ligation (63.8%), reflecting a common practice in low-resource settings where future pregnancy risks are mitigated due to limited follow-up care, similar to findings in Ebonyi, Nigeria which showed that uterine repair was done in 48% of cases, and bilateral tubal ligation in 52% of cases¹². Subtotal hysterectomy was performed in 10.6% of cases, typically in situations where repair was not feasible due to extensive tissue damage. While maternal survival was high (95.7%), the perinatal mortality rate was devastating, with 91.5% of fetuses not surviving, similar to finding from an Ethiopian study in 2017,

CONCLUSION

Uterine rupture persists as a critical maternal health issue in northeastern Nigeria, with this

which revealed a maternal survival of 93.4%, and fetal mortality in 98.3% of cases⁶. This stark contrast highlights the critical window for intervention in uterine rupture, where even slight delays can lead to fetal demise despite maternal salvage.

Postoperative complications were frequent, with anemia being the most common (40.0%), likely due to hemorrhage during rupture. Prolonged hospital stays (30.9%) and puerperal sepsis (10.6%) further illustrate the morbidity associated with this condition, imposing additional burdens on an already strained healthcare system. The occurrence of vesicovaginal (6.4%) and rectovaginal fistulas (3.2%) emphasizes the severe traumatic nature of uterine rupture, often leading to long-term debilitating consequences for survivors.

study revealing its strong association with preventable factors like obstructed labor,

high parity, and suboptimal obstetric management. The devastating perinatal outcomes and significant maternal morbidity underscore the urgent need for many-sided interventions. These should focus on enhancing community awareness, implementing strict protocols for oxytocin administration, and improving emergency obstetric referral networks. Strengthening

primary healthcare systems to enable early identification and timely management of high-risk deliveries could substantially mitigate this life-threatening complication. Future investigations should assess the long-term impact of such interventions on uterine rupture prevalence and outcomes in comparable low-resource environments.

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