Ruptured Uterus-A Study of Socio-Demographic and Obstetric Risk Factors in Aminu Kano Teaching Hospital

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Abstract

Objective

This is a comparative prospective study of the risk factors for ruptured uterus in Aminu Kano Teaching Hospital, Kano, Nigeria, between 1st January 2000 and 31st December 2005.

Materials and methods

Forty six women with ruptured uterus (cases) were compared with an equal number of women who delivered immediately after them without ruptured uterus (controls). Chi-square (x^2) test was used to determine statistical significance. The odds ratio (OR) and 95% confidence interval (CI) were determined where appropriate.

Results

The incidence of ruptured uterus was 1 in 278 deliveries (0.36%). The significant risk factors found were unbooked status (OR = 38.95, CI = 10.36 – 160.27), low socioeconomic status (OR = 4.27.51, CI = 1.64 – 11.29), being 30-39 years of age (OR = 2.77, CI = 1.02 – 7.65), grandmultiparity (OR = 3.37, CI = 1.29 – 8.96), prolonged obstructed labor (OR = 5.60, CI = 1.54 – 22.23). Poor supervision in labor (unbooked status) was the most common cause of ruptured uterus.

Conclusion

In a predominantly Islamic community like ours where early marriage is common, female western education and employment, education of their husbands, the community and their religious leaders on the importance of antenatal care and hospital delivery, will go a long way to improve its utilization and reduce the prevalence of ruptured uterus in our community.

Keywords: *Ruptured uterus, incidence, risk factors, developing country*

Introduction

Uterine rupture is a potentially catastrophic event for mother and baby during childbirth,[1-4] and still remains a common obstetric problem in developing countries like Nigeria where it has an incidence which ranges between 1 in 87 to 1 in 273 deliveries.[5-9] In Pakistan an incidence of 1 in 100 deliveries was reported[1], while in Ethiopia it was 1 in 38 deliveries.[2]

In uterine rupture the integrity of the myometrial wall is breached.[1-3] In an incomplete rupture, the peritoneum is still intact, whereas with a complete rupture it is also breached, allowing the contents of the uterus to spill into the peritoneal cavity or broad ligament.[1-4]

The reason for the high prevalence of ruptured uterus in developing countries is because more deliveries take place outside the health facilities and mismanagement by traditional birth attendants is common.[10-14] The underutilization of the scanty antenatal and family planning facilities, which stems from the low literacy level, poverty, socio-cultural barriers, and changing governmental policies, make poorly supervised or unsupervised labor be the leading risk factor.[3,10,11]

In developed countries, ruptured uterus is very rare, because mismanagement of labor due to delay in getting appropriate management is uncommon.[4] This is because of availability and utilization of the well established antenatal care and family planning services, as a result of high literacy level, improved socio-economic status, empowerment of women and desire for small family size.[4,12] Rupture from a previous caesarean section scar, or uterine surgery that resulted in full thickness incisions such as myomectomy, and oxytocin stimulation were found to be the most common risk factors.[4]

In developing countries, childhood marriages and pregnancies, as well as contracted pelvis from childhood malnutrition which predispose our women to cephalo-pelvic disproportion, and grandmultiparity from low contraceptive prevalence rates, are common.[6, 10]

In Ethiopia[2] 83.5%, and in Pakistan[1] 85.3% of the cases occurred in women with unscarred uterus. In Nigeria, the median age at first marriage is 18.3 years, and 23% of women aged 15-19 years are either pregnant or already mothers. Among married women aged 15-49, 15% employ at least one method of family planning of and 10 % of them use a modern method. The mean ideal number of children for women age 15 to 49 is 6.1.[14]

Most of the rural (public) hospitals and health centers in Nigeria are not functional for 24 hours of the day and coupled with the poor road network and transportation systems, the

result is delay in getting appropriate care in labor. Consequently, 65 to 70% of deliveries in Nigeria are conducted outside the hospitals by unskilled birth attendants or quacks, and 16.9% deliver on their own without assistance from anyone.[10,13,14] In Pakistan 89% of women deliver at home. Of these, 80% were delivered by TBAs.[1]

The Society of Gynecology and Obstetrics of Nigeria (SOGON) Needs Assessment Report in the six zones in Nigeria showed that, delay in getting appropriate care in labor is responsible for the high maternal morbidity and mortality ratio, with a regional variation which showed higher maternal mortality ratio in the North than in the South.[5-9] The estimated maternal mortality ratio in Nigeria (545/100,000 live births) is one of the highest in the world,[14] second only to India in the global estimates of maternal deaths.[10] The lifetime risk of maternal deaths in Nigeria is 1 in 23[10] while in Northern Europe it is 1 in 4000 because of absence of delays.[1]

The contribution of ruptured uterus to maternal mortality in all the six zones in Nigeria is similar[10] and it was also found to be one of the leading causes of maternal mortality in Nigeria,[5-9] Zimbabwe,[15] Guinea[3] and Ethiopia.[2] This may be because the single most important risk factor which is inadequate supervision in labor[3] is still prevalent in these developing countries. This is evident in Nigeria, where 58% of the pregnant women receive antenatal care from a skilled provider, 39% of births are assisted by a skilled provider, and 35% of births are delivered in a health facility.[14]

Fortunately, ruptured uterus is a preventable condition.[10] In-order to reduce maternal mortality and morbidity in our community and meet the Millennium Development goals (MDGs) [4, 5] it is essential to determine the risk factors for ruptured uterus-a leading cause of maternal mortality in developing countries like Nigeria, so that recommendation can be made on how to reduce its incidence.

Patients and methods

This comparative prospective study was conducted in Aminu Kano Teaching Hospital, Kano, Nigeria, between 1st January 2000 and 31st December 2005, to study the risk factors which predispose our women to ruptured uterus.

Forty-six (46) women with ruptured uterus (cases) were compared with an equal number of women who delivered without ruptured uterus (controls). The controls were the first consecutive women who delivered without ruptured uterus immediately after each one with a ruptured uterus. The data were prospectively collected and recorded in a database. Where the patients could not volunteer information, it was obtained from their relatives.

The study variables of interest were the socio-demographic characteristics of the women, their husband's occupation, occurrence of prolonged obstructed labor, previous caesarean sections, and induction or augmentation of labor. The woman's level of education and the husband's occupation were used to determine the social class.[4]

The data obtained were collated, and analysis was done using Epi- Info software (6.0 CDC Atlanta Georgia, USA). Chi-square test was used for comparison of the data for statistical significance. A p-value of < 0.05 was taken as significant. The odds ratio (OR) and 95% confidence interval (CI) were also determined where appropriate.

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Results

There were 12795 deliveries during the period of study, and 46 women had rupture uterus, giving an incidence of 1 in 278 deliveries (0.36%).

Table I shows a comparison of the socio-demographic characteristics of the women. Maternal age 30-39 (OR = 2.77, CI = 1.02 – 7.65), unbooked status (OR = 38.95, CI = 10.36 – 160.27) and low socioeconomic class (OR = 4.27, CI = 1.64 – 11.29) were found to be significant risk factors.

Table II shows a comparison of the obstetric variables of the women. Grandmultiparity (OR = 3.37, CI = 1.29 – 8.96) and prolonged obstructed labor (OR = 5.60, CI = 1.54 – 22.23) were found to be significant risk factors.

Discussion

The incidence of ruptured uterus in this study was 0.36% (1 in 278 deliveries), which is similar to1 in 87 to 1 in 273 deliveries that were reported in other studies from Nigeria,[5-10] 0.9% (1 in 110 deliveries) from Ethiopia[2] and 1.0% (1 in 100 deliveries) from Pakistan.[1] The high incidence of uterine rupture from these developing countries has been attributed to delays (Phase I, II & III) in getting proper treatment in labor,[3] which makes mismanagement of labor by unskilled birth attendants to be the most important singular risk factor.[1-10] This can be appreciated in this study, where the risk of ruptured uterus was 38 times higher among unbooked patients.

The highest frequency which occurred among the 30-39 years age group, may be because most of our grandmultiparae were within this age group (early marriage and child bearing are common in our community). This was also the finding in Kaduna, [6] a populous town in northwest Nigeria, with similar socio-cultural and religious background.

The risk of ruptured uterus which was significantly higher among the grandmultiparae, low socioeconomic class, and those with prolonged obstructed labor and this is similar to the findings of other authors.[5-8] It has been shown in other studies from developing countries that, grandmultiparity is common among the low socioeconomic class because of early marriage and poor utilization of family planning services.[10] These women are commonly unbooked, and present late in labor with prolonged obstructed labor from neglect.[16,19] This may explain the relationship between the risk factors found in this study.

In Nigeria, 70% of the women deliver outside a health facility,[10] and this is similar to the finding in Ethiopia,[2] Zimbabwe[15] and Pakistan.[1] The reason for the delay in getting proper care in labor, and the high prevalence of poorly supervised labor in the developing countries is because of scanty, poorly equipped and poorly manned health facilities, aversion to Western oriented programs like antenatal care and hospital delivery, poverty, poor access to the scanty health facilities, as well as poor transfer system.[10]

Most of the rural (public) health facilities are not functional for 24 hours in Nigeria,[11] and may be poorly equipped and manned, causing delay in diagnosing complications or lack of facilities to manage them.[10] Most of the health facilities do not meet the Emergency Obstetric Care (EOC) criteria in Nigeria. Only Lagos State met the EOC requirements of 5 midwives per shift in the public health facilities.[11] This together with poor transfer system

result in delay in getting to the health facilities in the cities, with resultant complications like ruptured uterus, especially in developing countries where there is high prevalence of cephalopelvic disproportion from contracted pelvis.[11] This may explain the high prevalence of ruptured uterus among unbooked patients in this study.

In Conakry-Guinea, there was a decrease in uterine rupture from 0.20% to 0.12%, and maternal mortality following uterine rupture from 28% to 21% after 6 months of implementation of a program of consultation, feedback and integration (effective transfer system) between peripheral delivery units and two hospitals.[3] Also because of utilization of their effective antenatal care and delivery facilities and effective transfer systems, the incidence of ruptured uterus and its contribution to maternal mortality has been reduced to an insignificant minimum in the developed countries.[4] This shows that effective health care delivery and transfer system, as well as community interventions aimed at encouraging the utilization of the antenatal care and delivery services, are essential to reduce the incidence of ruptured uterus and its contribution to maternal mortality.

In a predominantly Islamic society like ours where women marry early and are not socioeconomically empowered, involvement of the husbands and community are essential if women must avail themselves of antenatal care and delivery facilities. This can be done through education of the husbands, community and religious leaders.[16-19]

Injudicious use of oxytocics was not found to be a significant risk factor as earlier reported in some studies.[20-23] This is in spite of the fact that our rate of induction of labor was 3.6% of all deliveries,[21] a figure that is similar to the 3.0% from Sokoto[23] also in Nigeria, but lower than 9.5–33.7% in the United States of America.[20,22] It has been found that when patients are properly selected, misoprostol at 50 micrograms four hourly or more (as was done in this study) is safe and more effective than conventional methods of cervical ripening and labor induction and heralds the return of all the conveniences of daylight obstetrics.[20]

Previous cesarean section was not found to be a significant risk factor in this study-a similar conclusion in other studies.[4] This could be due to awareness on the part of the women and those who manage them, either in the hospital or elsewhere of the risks involved in managing women with previous uterine scar. In developed countries, rupture of a previous uterine scar and the use of oxytocic agents are the common causes of uterine rupture

because of low incidence of cephalopelvic disproportion, small family size, and absence of delay in getting proper management in labor.[4]

Conclusion and recommendations

The significant risk factors that were found in this study were maternal age 30-39 years, low socioeconomic class, unbooked status, prolonged obstructed labor, and grandmultiparity, with the common denominator being delay in getting proper management in labor.

Provision of free and accessible antenatal care and delivery facilities, campaign for antenatal care and hospital delivery, female western education and employment opportunities and acceptance of modern family planning methods to prevent grandmultiparity must be intensified in our community if the prevalence of ruptured uterus is to be reduced significantly and if the MDGs 4 and 5 are to be met.

In a predominantly Islamic society like ours where early marriage is common, involvement of the husbands, community and religious leaders is essential for success of this campaign.

References

1. **United Nation Childen Fund.** 1997; Women's Health in Pakistan
2. **Amanael G, Mengiste MM.** Ruptured uterus-eight year retrospective analysis of causes and management outcome in Adigrat Hospital, Tigray Region, *Ethiopia. J Health Dev.* 2002; 16(3):241-245.
3. **Balde MD, Bastert G.** Decrease in uterine rupture in Conakry, Guinea by improvements in transfer management. *Int. J. Gynecol. Obstet*. 1990;31(1):21-24.
4 **Fedorkow DM, Nimrod CA, Taylor PJ.** Ruptured uterus in pregnancy: A Canadian hospital's experience. *Can. Med. Assoc. J.* 1987;137:27-9.
5 **Ebeigbe NP, Enabudoso E, Ande AB.** Ruptured uterus in a Nigerian Community: a study of socio-demographic and obstetric risk factors. *Acta Obstet. Gynecol. Scand.* 2005; 84:1172-4
6 **Onwuhafua P, Onwuhafua A, Omekara D, Ibrahim R.** Ruptured uterus in Kaduna, Nigeria; a six year review. *J. Obstet. Gynecol*. 1998;18(5):419-23.
7 **Aboyeji AP, Ijaiya MD, Yahaya UR.** Ruptured uterus: a study of 100 consecutive cases in Ilorin, Nigeria. *J Obstet. Gynecol. Res.* 2001;27:341-8.
8 **Ezechi OC, Mabayoje P, Obiesie LO.** Ruptured uterus in South Western Nigeria: a reappraisal. *Singapore Med. J.* 2004;45:113-6.
9 **Olatunji AO, Sule-Odu AO, Adefuye PO.** Ruptured uteri at Sagamu, Nigeria. *Niger. Postgrad. Med. J.* 2002;9:235-9.
10. The SOGON National Partnership Plan for Sustainable Reduction in Maternal and Newborn Deaths. 2008.
11 National Study on Essential Obstetric Care Facilities in Nigeria. Federal Ministry Health, Nigeria. 2003. 21.
12 **Olusanyan O, Amiegheme N.** Biosocial factors in maternal mortality: a study from a Nigerian Mission Hospital. *Trop. J. Obstet. Gynecol.* 1988;1(1):88-9.
13 **Harrison KA.** Maternal mortality - a sharper focus on a major issue of our time. *Trop. J. Obstet. Gynecol.* 1988;1(1):9-13.
14 2008 Nigeria Demographic and Health Survey (NDHS
15. **Walsh CA,O"Sullivan RJ, Foley ME.** Unexplained prelabor uterine rupture in a term primigravida. *Obstet Gynecol*. 2006; 108(3):725-7.

16 **Rayamajhi R, Thapa M, Pandes.** The challenge of grandmultiparity in obstetric practice. *Kathmadu University Medical Journa*l. 2006;4(1):70-4.

17 **Etedafe P, Igbafe AA.** Grandmultiparity: Emerging trend in a tropical community. *Trop. J. Obstet. Gynecol.* 2001;18(1):27-30.

18 **Olusanya O, Okpere EE, Ezimokhai M.** The importance of social class in voluntary fertility control in a developing country. *West Afr. J. Med.* 1985;4:4.

19 **Briggs ND.** Maternal death in booked and unbooked patients: University of Port Harcourt Teaching Hospital experience. *Trop. J. Obstet. Gynecol.* 1988;1(1):26-9.

20 **Wagner M.** Misoprostol (cytotec) for labour induction. A cautionary tale. *Midwifery today.* 2003;67: 31-33.

21 **Omole-Ohonsi A, Belga Y.** Emergency Obstetric Hysterectomy. *Archives of Nigerian Medicine and Medical Sciences.* 2007; 4(2): 16-22.

22. **Ozsoy M, Ozsoy D.** induction of labor with 50 and 100ug of Misoprostol. Comparison of maternal and fetal outcomes. *Eur. J.Obstet. Gynecol. Repro. Biol.* 2004;113(1): 41-44.

23. **Ekele BA, Oyetunji JA.** Induction of labor at Usmanu Danfodio University Teaching Hospital, Sokoto. T*rop. J Obstet Gynecol.* 2002; 19 (2):74-77.

Table I: Socio-demographic Characteristics of the Women with Ruptured Uterus

Variable	Number (%)		P-value	OR	CI
	Case n = 46	Control n = 46			
Age in years					
15-20	2 (4.4)	9 (19.6)	>0.05	0.19	0.03 -1.02(NS)
20-29	23 (50.0)	17 (37.0)	>0.05	1.71	0.68 - 4.28(NS)
30-39	20(42.9)	10(28.2)	<0.05	2.77	1.02 - 7.65(S)
>40	1(3.5)	7 (15.2)	> 0.05	0.25	0.03 - 1.46(NS)
Social class					
Upper	3(6.5)	10(21.7)	>0.05	0.25	0.05 - 1.1(NS)
Middle	12(26.1)	21(45.7)	>0.05	0.42	0.16 - 1.10(NS)
Lower	31(67.4)	15(32.6)	<0.05	4.27	1.64 - 11.29(S)
Booking status					
Booked	5(10.9)	38(82.6)			
			<0.05	38.95	10.36 - 160.27(S)
Unbooked	41(89.1)	8(17.4)			

S= Significant for ruptured uterus

NS= Not significant for ruptured uterus

Table II: Obstetric factors for Ruptured Uterus

Variable	Number (%)		P-value	OR	CI
	Case n = 46	Control n = 46			
Parity					
Primigravidae (o)	3 (6.5)	10 (21.7)	>0.05	0.25	0.03 - 1.02 (NS)
Multigravida (1-4)	18 (39.1)	24(52.2)	>0.05	0.57	0.28 - 1.14 (NS)
Grandmultiparae (≥5)	25(54.4)	6(13.0)	<0.05	3.37	1.29 - 8.96(S)
Prolonged obstructed labor	16(34.8)	4(8.7)	<0.05	5.60	1.54 - 22.23(S)
Previous caesarean section	7(15.2)	11(23.9)	>0.05	0.57	0.18 - 1.82(NS)
Use of oxytocics	3(1.3)	8(21.7)	>0.05	0.33	0.06 - 1.52(NS)

S= Significant for ruptured uterus

NS= Not significant for ruptured uterus