

“Ruptured Uterus and its Associated Factors with Maternal and Fetal Outcome: A study in a tertiary care hospital, Rangpur, Bangladesh”

Dr. Anisa Begum¹, Dr. Hashiba Moontaha², Dr. Aysha Siddika³

¹Professor & Head, Dept. of Gynaecology and Obstetrics, Rangpur Medical College Hospital, Rangpur, Bangladesh

^{2,3}Assistant Registrar, Dept. of Gynaecology and Obstetrics, Rangpur Medical College Hospital, Rangpur, Bangladesh

Corresponding Author: Dr. Anisa Begum

Abstract: Maternal mortality and morbidity are the priority agenda for developing country like Bangladesh and uterine rupture is the leading cause of maternal and fetal death in these countries. There are limited data is available on the magnitude of uterine rupture; maternal and fetal outcomes of uterine rupture and its associated factors. An institution-based cross-sectional study was conducted during the period from January 2018 to December 2018 in the dept. of Gynaecology & Obstetrics, Rangpur Medical College Hospital, Rangpur, Bangladesh. The aim of the study was to evaluate ruptured uterus and its associated factors with maternal and fetal outcome. A total of 4834 mothers admitted in one year at the selected department in the hospital with maternal complications. Among them 3770 deliveries had been managed by the respective dept. in one year. Among total deliveries, 2442(64.77%) were vaginal deliveries and remaining 1328(35.23%) were assisted by cesarean sections and found 45 cases were uterine rupture with an overall prevalence rate of 3.38%. Most of them were from 20-29 years age group, representing 49.07% and came from rural areas. Among the total of 45 cases with ruptured uterus 24(53.33%) of mothers labored for longer than 24 hours. Eighteen (40%) mothers had no antenatal care follow up and 26 (57.78%) mothers started their labor at home. Completed rupture were in 41 (91.11%) study participants and incomplete rupture were in 4(8.89%). Regarding etiology of ruptured uterus, LSCS scar ruptured were 24(53.33%), followed by following obstructed labour 9 (20%), Hysterotomy scar & injudicious use of oxytocin 4(8.89%), and others were in 2(4.4%). Survival rate of mothers were 40 (88.89%). However, alive baby were only 2(4.44%). The magnitude of uterine rupture was high in the study area. Initiation of labor at health institutions, early treatment of hypo-volemia and prevention of postoperative anemia is recommended to decrease maternal death secondary to uterine rupture.

Key words: Ruptured Uterus, Maternal Outcome, Fetal Outcome

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I. Introduction

Uterine rupture is the tearing of the uterine wall and the loss of its integrity through breaching during pregnancy, delivery or immediately after delivery. It is a catastrophic event in obstetrics, often resulting in both maternal and fetal adverse consequences. Beyond this, it may expose the women have harmful sequel such as permanently infertility secondary to hysterectomy¹. Maternal mortality remains unacceptably high across many of the developing world especially in Sub-Saharan Africa (SSA) and South Asia. More than 87% of maternal deaths from the global maternal mortality ratio of 210 deaths per 1,00,000 live births in 2013 is accounted by Sub-Saharan Africa and South Asia². Ethiopia is the fifth country where the highest maternal mortality occurred next to Democratic Republic of Congo³. In this country, uterine rupture and obstructed labor together account for 29% of the total maternal mortality. This makes uterine rupture and obstructed labor to be the second major causes of maternal mortality next to abortion-related complications⁴ Even though uterine rupture is a rare event in developed countries; it is still one of the major public health problems in developing countries that endanger the life of many mothers⁵. WHO systematic review of maternal mortality and morbidity secondary to uterine rupture showed that, the prevalence of uterine rupture tends to be lower in developed countries than developing countries with a prevalence rate of 0.006%. Uterine rupture in developed countries mostly occurs secondary to prior cesarean section¹. Globally, the incidence of uterine rupture is 0.07% which is much lower than what is in Africa - 1.3%⁶. The main reasons for the occurrence of uterine rupture in developed countries are the use of uterotonics and trial of labor on a scarred uterus⁷⁻⁹. However, the major causes of uterine rupture in developing countries are obstetric and non-obstetric multihued of factors such as; multi-gravidity, teen-age pregnancy, old

primi, poor socio-economic status, previous cesarean section scar, unsupervised labor and unwise use of uterotonic agents¹⁰. A study from Uganda reported that multi-gravidity, old age pregnancy, and rural residency as significant predictors of uterine rupture¹¹. In addition, studies from Nigeria and Uganda showed that the main reasons for the occurrence of uterine rupture were unwise use of oxytocin drug, obstructed labor, grand multiparity and abnormal fetal presentation¹¹⁻¹³. A study conducted in Adigrat, Ethiopia showed that, the causes of uterine rupture were cephalo-pelvic disproportion, mal-presentation, trial of instrumental delivery, unwise use of pitocin for induction of labor and trial of labor with previous cesarean section scar. Uterine rupture maternal and fetal case fatality rate was 11.1% and 98.1% respectively¹⁴. The determinant factors for maternal outcome of uterine rupture differ across geographical boundaries due to the difference in socio-demographic status, and the availability and accessibility of skilled birth attendant and health system effectiveness. Assessing maternal outcome of uterine rupture and factors associated with maternal death in the study area is important to design policies and strategies for the prevention and the clinical management of uterine rupture. Therefore, This study aimed at assessing the magnitude of uterine rupture; maternal and fetal outcome of uterine rupture and factors associated with maternal death secondary to uterine rupture in a tertiary care hospital, Rangpur, Bangladesh.

II. Objective

General Objective:

To evaluate ruptured uterus and its associated factors with maternal and fetal outcome

Specific Objectives:

To observe the scenarios of uterine rupture in tertiary care hospital

III. Methodology and Materials

An institution-based cross-sectional study was conducted during the period from January 2018 to December 2018 in the dept. of Gynaenocology & Obstetrics, Rangpur Medical College Hospital, Rangpur, Bangladesh. The aim of this study was to evaluate uterine rupture and its associated factors with maternal and fetal outcome. A total of 45 cases with uterine rupture in the selected hospital were included in the study. For this study, we considered all records of mothers with uterine rupture who delivered and managed at selected hospital during the period from January 2018 to December 2018. A total of 4834 mothers admitted in one year at the selected department in the hospital with maternal complications. Among them 3770 deliveries had been managed by the respective dept. in one year. Among total deliveries, 2442(64.77%) were vaginal deliveries and remaining 1328(35.23%) were assisted by cesarean sections and found 45 cases were uterine rupture with an overall prevalence rate of 3.38%. The study then performed on that 45 patients with uterine rupture. The outcome variables for this study were maternal outcomes, fetal outcomes and maternal death and uterine rupture. Fetal outcomes considered in this study were stillbirth, live birth and whether the neonate was improved and discharged from the hospital. Due to numerous missing values, additional fetal out-comes such as Apgar scores and birth weight were not included in our analysis. First, the records of mothers with a case of uterine rupture managed at selected hospital from January 2018 to December 2018 were identified using their medical recording number from delivery and operation recording books.

IV. Results

This was a hospital based cross-sectional study conducted during the period from January 2018 to December 2018 in the dept. of Gynaenocology & Obstetrics, Rangpur Medical College Hospital, Rangpur, Bangladesh. The aim of the study was to evaluate ruptured uterus and its associated factors with maternal and fetal outcome. A total of 4834 mothers admitted in one year at the selected department in the hospital with maternal complications. Among them 3770 deliveries had been managed by the respective dept. in one year. Among total deliveries, 2442(64.77%) were vaginal deliveries and remaining 1328(35.23%) were assisted by cesarean sections and found 45 cases were uterine rupture with an overall prevalence rate of 3.38%. Most of them were from 20-29 years age group, representing 49.07% and came from rural areas. In the quantitative analysis we found most of the pregnant women were from 20-39 years` age group, more specifically 1850 from 20-29 years age group and 1674 from 30-39 years` age group. According to the residence of 3770 pregnant women we found most of them, 2880 (76.40%) were from rural areas. Most alarming finding is the death ratio of baby which is 43(95.55%) from 45 rupture uterine mother. Among the total of 45 cases with ruptured uterus 24(53.33%) of mothers labored for longer than 24 hours. Eighteen (40%) mothers had no antenatal care follow up and 26(57.78%) mothers started their labor at home. Completed rupture were in 41(91.11%) study participants and incomplete rupture were in 4(8.89%). Regarding etiology of ruptured uterus, LSCS scar ruptured were 24(53.33%), followed by following obstructed labour 9(20%) Hysterotomy scar & injudicious use of oxytocin 4(8.89%), and others were in 2(4.4%). Survival rate of mothers were 40(88.89%). However, alive baby were only 2(4.44%).

Table I: Socio-demographic characteristics of mothers (n=3770)

Variable	n	%
Age in years		
15–19	75	1.99
20–29	1850	49.07
30–39	1675	44.43
≥40	170	4.51
Place of residence		
Urban	890	23.61
Rural	2880	76.4

Figure I: Etiology of ruptured uterus (n=45)

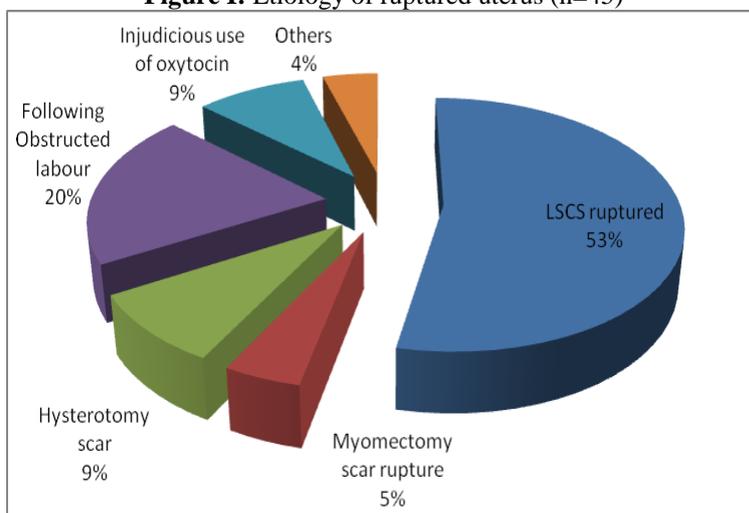


Table II: Characteristics of uterine rupture mothers (n=45)

Variable	n	%
Rupture		
Completed	41	91.11
Incomplete	4	8.89
Etiology of ruptured uterus		
LSCS scar ruptured	24	53.33
Myomectomy scar rupture	2	4.44
Hysterotomy scar	4	8.89
Following Obstructed labour	9	20
Injudicious use of oxytocin	4	8.89
others	2	4.44
Management		
Repair of Uterus	19	42.22
Total hysterectomy	24	53.33
Subtotal Hysterectomy	2	4.44

Table III: Maternal and fetus out-come of participants.(n=45)

Mother/Baby	n	%
Maternal		
Survival	40	88.89
Death	5	11.11
Fetus		
Alive baby	2	4.44
Death baby	43	95.56

Table IV: Factors associated with maternal death. (n=45)

Variable	Maternal death		COR 95%CI	AOR 95% CI	P value
Place of labor	Yes (%)	No (%)			
Home	3(6.66)	19(42.22)	5.76(1.28–25.92)*	6.92 (1.16–33.74)*	0.045
Health facility	2(4.44)	21(46.66)	1	1	
Hypovolemic shock					
Yes	3(6.66)	18(40)	3.49(1.22–9.98)*	3.48 (1.01–11.96)*	0.037
No	2(4.44)	22(48.88)	1	1	
Age					
≥34	1(2.22)	20(44.44)	0.24(0.03–2.02)	0.092 (0.01–0.956)*	0.038
22–33	1(2.22)	12(26.66)	2.9(0.99–8.45)	2.18 (0.06–7.81)	
≤21	3(6.66)	8(17.77)	1	1	

*= statistically significant at P-value < 0.05

V. Discussion

This was a cross-sectional study conducted during the period from January 2018 to December 2018 in the dept. of Gynaecology & Obstetrics, Rangpur Medical College Hospital, Rangpur, Bangladesh. The aim of the study was to evaluate ruptured uterus and its associated factors with maternal and fetal outcome. A total of 4834 mothers admitted in one year at the selected department in the hospital with maternal complications. Among them 3770 deliveries had been managed by the respective dept. in one year. Among total deliveries, 2442 (64.77%) were vaginal deliveries and remaining 1328 (35.23%) were assisted by cesarean sections and found 45 cases were uterine rupture with an overall prevalence rate of 3.38%. With those 45 uterine rupture patients we interred to the arena of main study. Most of them were from 20-29 years age group. Among them completed rupture were in 41 (91.11%) study participants and incomplete rupture were in 4 (8.89%). Regarding etiology of ruptured uterus, LSCS scar ruptured were 24 (53.33%), followed by following obstructed labour 9 (20%) Hysterotomy scar & injudicious use of oxytocin 8.89%, and others were in 4.4%. Survival rate of mothers were 40 (88.89%). However, alive baby were only 4.44%. In the quantitative analysis we found most of the pregnant women were from 20-39 years` age group, more specifically 1850 from 20-29 years age group and 1674 from 30-39 years` age group. According to the residence of 3770 pregnant women we found most of them, 2880 (76.40%) were from rural areas. Most alarming finding is the death ratio of baby which is 43 (95.55%) from 45 rupture uterine mother. The prevalence in the current study was lower when compared with studies in Angola (4.9%)¹⁵ and Yergalem general hospital, Ethiopia (5%)¹⁶. This could be due to the time variation, improvement of health service infrastructure and quality of health service provision. In this study, 57.78% of the mothers labored at home. This finding is consistent with the study in Adigrat hospital, Ethiopia. The possible explanation could be due to lack of accessibility of adequate hospitals in rural parts of Ethiopia and lack of awareness of institutional delivery service utilization in most parts of the country¹⁷ Obstructed labor accounted for 20% of uterine rupture in this study, while previous uterine scar accounted for only 3.7% (9) cases. This figure is much higher than studies from Nigeria, 47.3% (scar = 22.1%), Adigrat in the northern Ethiopia 79.6% (scar = 11.2%) and Pakistan 12.5% (scar = 12.5%). This difference might be due to the variation in socio-economic factors and environmental factors, lack of transport for immediate shifting of patients to the referral hospital illiteracy in the community, lack of antenatal care, lack of screening for high-risk pregnancy, and unsupervised labor conducted in poorly equipped centers. It might also be due to the inadequacy of the health facilities to recognize and give definitive management for Cephalo-pelvic disproportion (CPD) and obstructed labor. The current study shows, the majority of uterine rupture, 41(91.11%) have a complete uterine rupture and only 4 (8.89%) had incomplete rupture. Similar to this, finding, a study from Turkey by Turgut and colleagues revealed that complete type of rupture is more likely to occur among mothers admitted for the management of uterine rupture¹⁸. Hysterectomy was performed for 73.9% of patients (Total Abdominal Hysterectomy = 138 or 57% and Subtotal hysterectomy, STAH =41 or 16.9%. For 27% of the cases, uterine repair were 23.3% with bilateral tubal ligation (BLTL) and for 3.7% repair without bilateral tubal ligation (BLTL) was performed. This finding is higher than studies from Turkey (TAH 0 34%) and Nigeria, where hysterectomy was performed for 31.6% of cases (TAH =7.4% STAH = 24.2%) and repair without BTL was done for 30% of cases of uterine rupture¹⁹.The possible explanation could be the difference in health care provider’s skill and the difference in health institution set up²⁰. Ruptured uterus is the most common indication in performing hysterectomy. However, abnormal placentation was reported to be the most common indication for hysterectomy by a study from Turkey. Although hysterectomy is considered as lifesaving procedure of obstetric emergency²¹. Unfortunately uterine rupture cannot be adequately predicted among women desiring a trial of labor for VBAC, so constant preparedness is needed.²³ screening patients is helpful in some cases. In a patient with a known prior classic incision, repeat surgical delivery should be planned for before the point that spontaneous labor may be expected.²⁴ Physicians also should review a woman’s history for factors associated with higher rupture rates and give her a balanced understanding of her relative risks, benefits, alternatives, and probability of success.

Limitation of the study

This was a single center study with small sample size, which may not reflect the scenarios of the whole community.

VI. Conclusion and Recommendations

Although, out of 3770 admitted pregnant mothers, 45 (1.19%) uterine rupture patient's number is not a big number but among those 45 patients, mortality of 5 patients which is more than 11% is very high and demands more attention to the responsible authorities and persons. Besides this, 43 deaths of babies from only 45 uterine rupture mothers is also alarming. So after this study, we would like to recommend conducting more research regarding this issue whenever and wherever is possible.

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