Research Article

Maternal and perinatal outcomes of uterine rupture patients among mothers who delivered at mizan aman general hospital, SNNPR, south west Ethiopia; a five year retrospective hospital based study

Abstract

Background: Uterine rupture causes high maternal and perinatal mortality in many rural setting in the world. Ethiopia is one of the less developed countries where maternal and perinatal mortality rates are still very high.

Objective: To determine maternal and perinatal outcomes of uterine rupture patients among mothers who delivered at Mizan-Aman General Hospital, South west Ethiopia.

Methods: A descriptive hospital based cross sectional study on maternal and perinatal outcome of uterine rupture patients among mothers who delivered at Mizan-Aman General Hospital was done from June 1, 2011 - May 31, 2015. Data on socio demographic, obstetrics, intraoperative, post op complication, maternal and perinatal outcome was collected. The collected data analyzed with SPSS 20.0. Association between dependent and independent variables was done by using binary logistic regression model and P-Value <0.05 at 95% CI was taken as statistically significant.

Result: 115patient cards were included in the study. There were 1(8.3%) intra operative maternal death and 11(91.7 %) post-operative death, making case fatality rate of uterine rupture 10.4 %. The incidence of uterine rupture in the hospital was 1.6%. There were 110(95.6%) of neonatal death and 5(4.6%) of neonate were delivered alive, those delivered with instrument and from previous uterine scar. The common causes of uterine rupture were obstructed labor 57(49.6%) followed by malpresentation and malposition which account 26(22.6%). Of all uterine rupture patients 102(88.7%) were complete rupture, the common site of rupture were 38(33%) anterior transverse lower segment followed by anterior low vertical 22(19.1%). Repair with bilateral tubal ligation in 48(41.7%) followed by repair without bilateral tubal ligation in 34(29.6%) were the common procedures done for ruptured uterus patients.

Conclusion: Hemoglobin level, blood transfusion, diagnosis of uterine rupture before operation had strong association with maternal out come and neonatal intensive care unit admission had also strong association with perinatal outcome.

The common causes of uterine rupture are obstructed labor followed by malpresentation/position. Complete uterine rupture and anterior lower segment rupture were by far the commonest patterns of uterine rupture by type and site respectively.

Keywords: uterine rupture, maternal outcome, perinatal outcome, mizan aman general hospital

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Introduction

Rupture of the pregnant uterus, similar to rupture of any internal organ, can be life threatening for the mother and fetus.[1] Uterine rupture is a tear in the wall of the uterus which commonly occurs in the lower segment of the uterus. The tear could be anterior, posterior, lateral or combination of these. It could be transverse, vertical or combination of these. In most cases, it occurs in the intra - partum or ante partum period.

Uterine rupture typically is classified as either:

A. Complete when all layers of the uterine wall are separated, or

B. Incomplete rupture the uterine wall is separated but the visceral peritoneum is intact.[2]

Fetal bradycardia is the most common and characteristic clinical manifestation of uterine rupture. Variable or late decelerations may precede the bradycardia, but there is no fetal heart rate pattern pathognomonic of rupture.[3]

Maternal manifestations are variable. Uterine rupture should always be strongly considered if constant abdominal pain and signs of intra-abdominal hemorrhage are present. Vaginal bleeding is not a cardinal symptom, as it may be modest, despite major intra-abdominal hemorrhage. However, case reports and series indicate that pain may not be present in sufficient amount, character, or location to suggest uterine rupture.[4] Other potential clinical manifestations include maternal tachycardia, hypotension ranging from subtle to severe (hypovolemic shock), cessation of uterine contractions, loss of station of the fetal presenting part, uterine tenderness, and change in

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uterine shape. Intuitively, loss of integrity of the uterine wall should be associated with a reduction in intrauterine pressure.[5,6]

Medical induction or augmentation of labor is an iatrogenic risk factor for uterine rupture.[7,8] Uterine rupture can lead to multiple adverse outcomes, including severe hemorrhage, bladder laceration, hysterectomy, and infant death or morbidity from prematurity of hypoxemia.[9,10] The frequency of these outcomes depends on factors such as the size and location of the rupture, and speed of intervention. Rupture of the unscarred uterus may be associated with greater maternal and fetal complications than rupture of the uterus after prior cesarean birth.[11]

Methods and materials

Study area and study period

The study was conducted in the department of Gynecology and Obstetrics in Mizan Aman General Hospital which is found in Mizan-Aman Town, South-west Ethiopia. The total catchment area population was 760,314; of which 381,449 were males and 378,865 were females. It had 136 beds. Out of this 32 beds were found in gynecology and obstetrics ward. The hospital has 120 health professionals in different disciplines.

Study design

Hospital based cross-sectional study design was conducted.

Data collection procedure

One day intensive training was given to the data collectors and supervisors. The data was collected by using check list that was adapted from health management information system registration book and modified for the purpose of the study and designed in English language to meet the requirement of the study, from registration books, client cards and retrieved patient's records. Using card number of patients, cards was collected from the card room. Finally, based on the inclusion and exclusion criteria of the study, cards was selected and the data for the study was collected using structured check list which was prepared in English that had socio-demographic variables, obstetric history, intra-operative, post-operative condition, maternal and perinatal outcome of uterine rupture patients.

Data processing and analysis

Data was first checked manually for completeness then coded and entered into SPSS version 20.0 for analysis. Frequency distribution of both dependent and independent variables was worked out and the association between independent and dependent variables was measured and tested using logistic regression. Analysis was conducted using with their 95% CI. Crude odds ratios of maternal and perinatal outcome were estimated for all independent variables in the binary logistic regression. All variables with p-value<0.05 was declared predictors of maternal and perinatal outcome of uterine rupture and was considered statistical significance association on logistic regression model and all variables with p-value<0.25 were entered into multiple logistic regression model.

Ethical considerations

Ethical approval was obtained from Ethical review board of Jimma University, College of Public Health & Medical Science. The procedure and purposes of the study was explained to the hospital manager and to the hospital medical director. Mizan Aman General Hospital was gave permission to conduct the study. The patient's name was not included in the Check list, after finishing the data collection the patient's document return to card room, the information used for study purpose only.

Result of the study

Socio-demographic characteristics

Between June 1, 2011-May 31, 2015 in Mizan Aman General Hospital, the ages of mothers who got uterine rupture ranged between 18-40years. Ninety-seven (84.3%)patients belongs to in the age group of 19-35years followed by the age group greater than or equal to 35years15(13%), with the mean age of 27.94±4.78 (Table 1).

Among uterine rupture patients eighty five (73.9%) were from rural area (Figure 1).
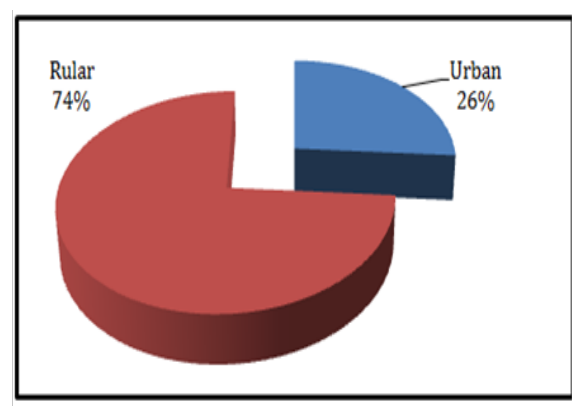

Figure 1 Residential distribution of uterine rupture patients.

Table 1 Age distribution of total uterine rupture patients

Socio-demographic characteristics		Frequency (N=115)	Percentage
Age	≤18 years	3	2.6
	19-35years	97	84.3
	≥35years	15	13.1

Obstetrics profile

The parity ranges from 0-VIII with the mean parity of 3.46±1.67. Among the patients who got uterine rupture 6(5.2%) were nulli Para, 86(74.8%) patients were of Para I-IV, 23(20%) patients were Para V or above. Only eighty four (83%) mothers had at least one antenatal care any were. Among patient with uterine rupture 91 (79.1%) of patient were stayed in labor for more than 24hours and the mean duration of labor for all patients of rupture uterus was 31.04±12.61.The duration of labor ranges from 6 hours to 72hours (Table 2).

During the study period there were a total of 8509 hospital delivery, 6707(78.8%) were vaginal delivery 1666 (19.6%) were by caesarean delivery and 136(1.6%) were delivered by laparotomy (Table 3).

During study year from 2011-2015 maternal death due to uterine rupture decreased from 4 to 1, case fatality rate were decreased from 16% to 4.8%, as well as total hospital delivery increased from 1186 to 1982 (Table 4).

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Table 2 Obstetrics profile of uterine rupture patients

Obstetrics profile	Frequency (N=115)	Percentage
parity		
Nulliparous	6	5.2
I-IV	86	74.8
≥V	23	20.0
Antenatal Care Follow up		
Yes	84	73
No	31	27
Mother Come with Referral Paper		
Yes	76	66.1
No	39	33.9
Duration of Labor		
<24hours	24	20.9
≥24hours	91	79.1
Gestational Age		
< 37weeks	10	8.7
Between 37 and 42weeks	97	84.3
≥42weeks	8	7

Table 3 Data of obstetric interventions

Mode of delivery	Number (N=8509)	Percentage
Vaginal Delivery	6707	78.8
Caesarean Section	1666	19.6
Laparotomy for Uterine Rupture	136	1.6

Clinical feature

The most common patient complain were of cessation of contraction 90(31.5%) followed by abdominal pain 85(29.7%) and vaginal bleeding 56(19.6%). The common physical findings among patient with uterine rupture were 102(37.1%) of patients had absent fetal heart beat followed by easily palpable fetal part 88(32%) and shock 72(26.2%).

Regarding the hemoglobin level

107(93%) of patients were with hemoglobin were greater than or equal 7g/dl and 8(7%) of patient's hemoglobin level below 7g/dl.

Diagnosis was made based on sign and symptom in 109(94.8. %) patients before laparotomy and in 6(5.2%) patient's diagnosis was made after laparotomy of which 4(66.7%) for suspected uterine rupture and 2(33.7%) for Post-partum hemorrhage. Resuscitation was done for all patients (Table 5).

The common cause of uterine rupture were obstructed labor 57(49.6%) flowed by malpresentation/position 26(22.6%) and previous uterine scar 9(7.8%) which were Previous CS scar 5(55.6%), previous myomectomy scar 2(22.3%) and rupture repair 2(22.3%) (Figure 2).

Intra and post-operative condition

Among patient with uterine rupture, 102(88.7%) were complete uterine rupture and 13(11.3%) were incomplete rupture. The common site of rupture was anterior transverse lower segment 38(33%) followed by anterior low vertical 22(19.1%) and no documented mixed type of rupture.

There were 3(2.6%) of cases with bladder rupture (Table 6) & (Figure 3). Intra operatively the procedures takes 20-90minutes with the mean minute of 50.4±SD=12.7. Blood was transfused for 59(51.3%) of patients (Figure 4).

In this study repair with bilateral tuba ligation 48(41.7%), repair without tuba ligation 34(29.6%), subtotal abdominal hysterectomy 24(20.9%) and 8(7%) of patients total abdominal hysterectomy were intra operative procedure performed.

Table 4 Incidence and case fatality rates of Uterine rupture patients

Years of study	Uterine ruptured patients	Maternal death	Total hospital delivery/year	Case fatality rate (%)	Caesarean section	Caesarean section rate (%)
2011	25	4	1186	16	261	22
2012	25	2	1434	8	287	20
2013	24	3	2036	12.5	322	15.8
2014	20	2	1871	10	425	22.7
2015	21	1	1982	4.8	371	18.7
Total	115	12	8509	10.4	1666	19.6

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Table 5 Clinical feature and pre-operative evaluation of patient with uterine rupture patients

| Clinical feature	Frequency	Percentage
Cessation of Contraction	90	31.5
Abdominal Pain	85	29.7
Vaginal Bleeding	56	19.6
Prolonged Labor	52	18.2
Others	3	1
Combined clinical feature		
Vaginal Bleeding+Cessation of Contraction+ Abdominal Pain+ Prolonged Labor	10	8.7
Vaginal Bleeding+Cessation of Contraction+ Abdominal Pain	24	20.9
Vaginal Bleeding+Cessation of Contraction	2	1.7
Cessation of Contraction+Abdominal Pain	15	13
Cessation of Contraction+Abdominal Pain+Prolonged Labor	11	9.6
Others combined clinical feature	53	46.1
Physical Finding		
Absent Fetal Heart Beat	102	37.1
Easily Palpable Fetal Part	88	32
Shock	72	26.2
Sepsis	6	2.2
Others	7	2.5
Combined Physical Finding		
Absent Fetal Heart Beat+Easily Palpable Fetal Part+Shock +Sepsis	3	2.6
Absent fetal Heart Beat+Easily Palpable Fetal Part+Shock	48	41.7
Absent Fetal Heart Beat+Easily Palpable Fetal Part	23	20
Easily palpable Fetal Part+Shock	12	10.4
Other Physical Finding	29	25.2
Hemoglobin Level Before Operation		
<7g/dl	8	7
≥7g/dl	107	93
Diagnosis of Uterine Rupture Before Laparotomy		
yes	109	94.8
No	6	5.2
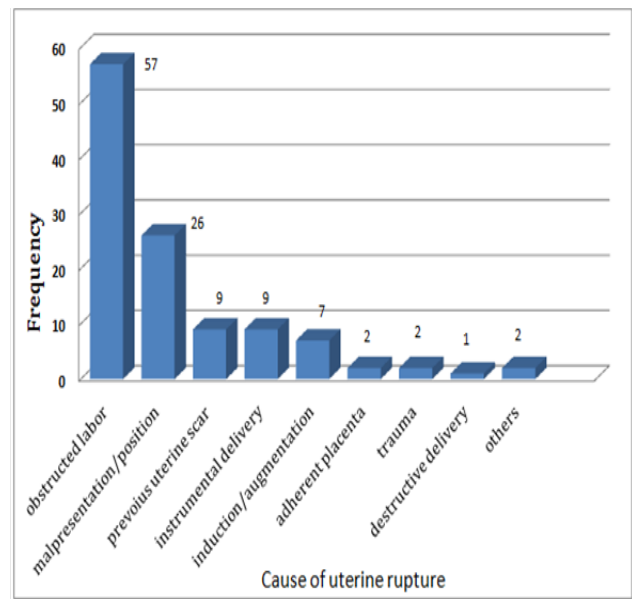
Figure 2 Causes of uterine rupture.
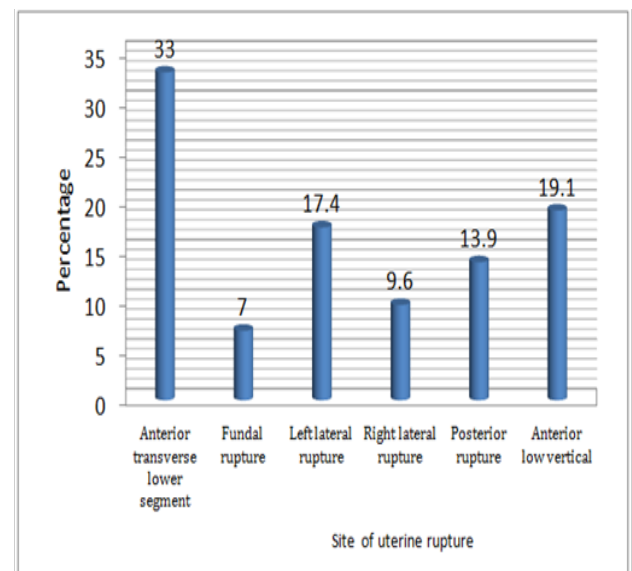
Figure 3 Site of uterine rupture.

Table 6 Type, site and associated injury of uterine rupture

Type of uterine rupture	Frequency(N=115)	Percentage
Complete Rupture	102	88.7
Incomplete Rupture	113	11.3
Bladder Injury		
Yes	3	2.6
No	112	97.4

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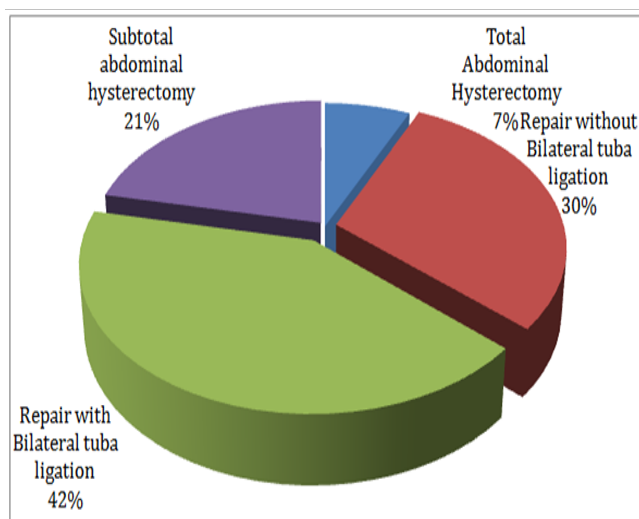Copyright:
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Figure 4 Type of procedure done for uterine rupture.

Based on information documented on patients chart post-operative complication; surgical site infection 14(29.2), anemia 6(12.5%), vesicovaginal 3(6.3%), rectovaginal fistula 2(4.2%), Postpartum hemorrhage 2(4.2%), Post-operative sepsis 7(14.6%), Post op psychosis 1(2.1%) and others 3(6.3%) (Table 7).

Table 7 Post-operative complication of mother diagnosed uterine rupture

Post operation Complication		Frequency	Percentage
Surgical Site Infection		14	29.2
Post-Operative Sepsis		7	14.6
Anemia		6	12.5
Fistula	Recto Vaginal Fistula	2	4.2
	Vesico Vaginal Fistula	3	6.3
Pneumonia		4	8.3
Paralytic Ileus		4	8.3
Pelvic Collection		2	4.2
Postpartum Hemorrhage		3	4.2
Post Op Psychosis		1	2.1
Others		3	4.2

Maternal outcome of uterine rupture

There was one (8.3%) intra operative maternal death and 11(91.7%) post-operative death, making case fatality rate of uterine rupture 10.4%.

Among causes of maternal death, 8(66.7%) of patients were expired with sepsis with multiple organ failure followed by hemorrhagic shock of one (8.3%), three (60%) relaparotomy done for an indication of fascial dehiscence followed by pelvic collection 2(40%).

Fifty four (47%) of patients were discharged within seven days of admission and 65(53%) of patients were stayed in hospital for more than 7days (Table 8).

Table 8 Maternal outcome, cause of death and indication for relaparatomy for uterine rupture patients

Maternal Outcome of Uterine Rupture		Frequency	Percentage
Alive		103	89.6
Died	Intra Operative	1	9.6
	Post-Operative	11	0.8
Total		115	100
Cause of Death			
Sepsis with Multiple Organ Failure		8	66.7
Hemorrhagic Shock		1	8.3
Anemia		1	8.3
Others		2	16.7
Indication for Relaparatomy			
Fascial Dehiscence		3	60
Pelvic Collection		2	40
Duration of Hospital Admission After Operation			
≤7days		54	47
>7days		61	53

Perinatal outcome of uterine rupture

There were a total of five alive deliveries from uterine rupture patients. Four (3.5%) favorable perinatal out come and four of them discharge with no complication and 111 unfavorable perinatal outcomes. Among unfavorable perinatal outcomes 88(76.5%) macerated, 22(19.1%) freshly dead and 1(0.9%) died after delivery makes perinatal case fatality rate 95.7%. Among the new born 110 (95.7 %) were 1st minute Apgar score was zero/still birth, 2(1.7%) of the fetus the 1st minute Apgar score was below seven, 3(2.6%) were 1st minute Apgar score was normal.

One (0.9%) of the fetal weight<2500g, 93(80.9%) of the fetus weight were between 2500-3999g and 21(18.3%) were above or equal to 4000g. Of all the study subject 2(1.7%) of the fetus were need ICU admission as shown in Table 9.

Table 9 Perinatal outcome of uterine rupture

Variable		Frequency	Percent
Weight of Neonate			
<2500 grams		1	0.9
2500-3999 grams		93	80.9
≥4000 grams		21	18.3
Need Intensive Care Unit Admission			
Yes		2	40
No		3	60
Birth Asphyxia			
yes		1	40
no		4	60
Neonatal Sepsis			
yes		1	20
no		4	80
Apgar Score			
<7		2	40
≥7		3	60
Perinatal Outcome			
Favorable (Discharged Alive)		4	3.5
	Freshly Dead	88	76.5
Unfavorable	Macerated	22	19.1
	Died after Delivery	1	0.9

Factor associated with maternal outcome of uterine rupture

The result of this study on simple binary logistic analysis shows; hemoglobin level below 7g/dl (COR=5.69; 95%CI: 1.29, 25.09), mothers who were in shock before operation (COR=4.28; 95%CI: 1.549, 11.81), uterine rupture patients who didn't attend ANC follow up (COR=6.0; 95%CI: 2.15, 16.74), mothers who did not get transfusion(COR=3.95; 95%CI: 1.33, 11.76) and mothers who had relaparatomy done (COR=23.50; 95%CI:2.47, 223.97) had significant associations with maternal outcome.

Other factors like residence, age, gestational age, duration of labor, patient come with referral paper, type of rupture, hospital stay after operation and diagnosis before operation has no significant association with maternal outcome (p value>0.05) (Table 10).

Table 10 Binary logistic regression analysis that shows measure of association and maternal management outcome of uterine rupture

Variables	Maternal out come		COR(95% CI)	P value
	Favorable N=95 (%)	Unfavorable N=20 (%)		
Residence				
Urban	28(29.5)	2(10.0)	1	
Rural	67(70.5)	18(90.0)	3.76(0.82,17.30)	0.089
Age				
< 19 years	2(2.1)	1(5.0)	2.53(0.22,29.62)	0.459
19-35 years	81(85.3)	16(80)	1	
≥35 years	12(12.6)	3(15)	1.27(0.32,5.00)	0.737

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Table Continued..

Variables	Maternal out come		COR(95% CI)	P value
	Favorable N=95 (%)	Unfavorable N=20 (%)		
ANC follow-up				
Yes	76(80.0)	8(40.0)		
No	19(20.0%)	12(60.0)	6.0(2.15,16.74)	0.001**
Hemoglobin Level				
< 7g/dl	4(4.2)	4(20.0)	5.69(1.29,25.09)	0.022**
≥7g/dl	91(95.8)	16(80.0)	1	
Blood Transfusion				
Blood transfused	54(56.8)	5(25.0)	1	
Not blood transfused	41(43.2)	15(75.0)	3.95(1.33,11.76)	0.014**
Type of Rupture				
Complete	85(89.5)	17% (85.0)	0.67(.17,2.68)	0.568
Incomplete	10 (10.5)	3(15.0)	1	
Relaparatomy Done				
Yes	1(1.1)	4(20.0)	23.50(2.47,223.97)	0.006**
No	94(98.9)	16(80.0)	1	
Duration of Labor				
<24 hours	21(22.1)	3(15.0)	1	
≥ 24 hours	74(77.9)	17(85.0)	1.61(0.43,6.02)	0.48
Patient Out of Shock				
Yes	77(81.1)	10(50.0)	1	
No	18(19.9)	10(50.0)	4.28(1.55,11.81)	0.005**
Patient Come with Referral Paper				
Yes	63(66.3)	13(65.0)	1	
No	32(33.7)	7(35.0)	1.06(0.39,2.92)	0.91
Gestational Age				
< 37 Weeks	8(8.4)	2(10.0)	1.27(0.25,6.52)	0.778
≥37, <42 weeks	81(85.3)	16(80.0)	1	
≥ 42 weeks	6(6.3)	2(10.0)	1.69(0.312,9.13)	0.543
Hospital Stay After Operation				
< 7 days	48(50.5 %)	6(30.0)	1	
≥7 days	47(49.5)	14(70.0)	2.38(0.84,6.73)	0.101
Diagnosis Before Operation				
Yes	89(93.7)	17(85.0)	0.38(0.089,1.68)	0.202
No	6(6.3)	3(15.0)	1	

**Shows p value<0.05 significant association

Factor associated with perinatal outcome of uterine rupture

The result of the study on simple binary logistic regression finding showed that neonate who did not need ICU admission had statistically significant association with perinatal outcome (COR=0.03; 95%CI: 0.01, 0.55). Other factors like Antenatal care, patients came with referral paper, residence, and patient out of shock has no significant association with perinatal outcome (P value>0.05) (Table 11).

By multiple logistic regression analysis hemoglobin level, blood transfusion, relaparotomy, ANC follow had significant association with maternal outcome (p value<0.25).

i. Mothers whose hemoglobin level below 7 g/dl had 12.31 times unfavorable outcome than those whose hemoglobin level above or equal 7g/dl (AOR=12.31; 95%CI: 1.57, 96.52).

ii. Uterine rupture mothers who were in shock had 2.2 times unfavorable outcome than those mothers who are out of shock before operation (AOR=2.20; 95%CI: 0.58, 8.32).

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iii. Mothers who had not attended ANC follow up have 7.33times unfavorable outcome than those mothers who had ANC follow up (AOR=7.33; 95%CI: 1.88, 28.67).

iv. Uterine rupture mothers who were not blood transfused had 5.56 times unfavorable outcome than those uterine rupture mothers who got blood transfusion (AOR=5.56; 95%CI: 1.33, 23.29).

v. Ruptured uterus mothers for whom relaparatomy done had 15.59 times unfavorable outcome than those who had no relaparatomy done (AOR=15.59; 95%CI: 1.11, 219.07) as shown Table 12 below.

vi. In multiple logistic regression

vii. Neonates who did not need intensive care unit admission 97% times unfavorable outcome than those fetus who need intensive care unit (AOR=0.03; 95%CI: 0.001, 0.60).

viii. Those mothers who came with referral paper had 45% times unfavorable outcome than those who came without referral paper (AOR=0.55; 95%CI: 0.07, 4.62) (Table 13).

Table 11 Binary logistic regression that shows measure of association and perinatal management outcome of uterine rupture

	Perinatal out come		COR (95 % CI)	P value
	Favorable N=4(%)	Unfavorable N=111(%)	COR(95 % CI)	
Need ICU Admission				
Yes	1(25.0)	1(0.9)	0.03(0.01,0.55)	.019**
No	3(75.0)	110(99.1)	1	
Antenatal Care				
yes	1(25.0)	83(74.8)	1	
No	3(75.0)	46(25.2)	0.11(0.01, 1.13)	0.63
Patient Out of Shock				
yes	3(75.0)	84(75.7)	1	
No	1(25.0)	27(24.3)	0.96(0.09, 9.67)	0.975
Residence				
urban	1(25.0)	29(26.1)	1	
Rural	3(75.0)	82(73.9)	1.06(0.11, 10.61)	0.96
Patient Come with Referral Paper				
yes	2(50.0)	74(66.7)	1	
No	2(50.0)	37(33.3)	0.50(0.07, 3.69)	0.49

** (P Value < 0.05) significant association.

Table 12 Multiple logistic regression analysis on predictor variables and maternal management outcome of uterine rupture

Variables	Maternal Out Come		COR (95 % CI)	P value	AOR(95% CI)	P value
	Favorable (N=95)	Unfavorable (N=20)				
Hemoglobin Level						
<7g/dl	4(4.2%)	4(20.0%)	5.69(1.29,25.09)	0.022	12.31(1.57,96.52)	0.017*
≥7g/dl	91(95.8%	16(80.0%)	1		1	
Blood Transfusion						
Blood Transfused	54(56.8%)	5(25.0%)	1		1	
Not blood transfused	41(43.2. %)	15(75.0%)	3.95(1.33,11.76)	0.014	5.562(1.33,23.29)	0.019*
Relaparotomy Done						
Yes	1(1.1%)	4(20.0%)	23.5(2.47,223.97)	0.006	15.59(1.11,219.07)	0.042*
No	94(98.9%)	16(80.0%)	1		1	

Table Continued..

Variables	Maternal Out Come		COR (95 % CI)	P value	AOR(95% CI)	P value
	Favorable (N=95)	Unfavorable (N=20)				
ANC Follow-Up						
Yes	76(80.0%)	8(40.0%)	I		I	
No	19(20.0%)	12(60.0%)	6.0(2.15,16.74)	0.001	7.33(1.88,28.67)	0.004*
Diagnosis Before Operation						
Yes	89(93.7%)	17(85.0%)	0.38(0.089,1.68)	0.202	0.33(0.04,2.60)	0.294
No	6(6.3%)	3(15.0%)	I		I	
Residence						
Urban	28(29.5)	2(10.0)	I		I	
Rural	67(70.5)	18(90.0)	3.76(0.82,17.30)	0.089	8.65(0.89,83.66)	0.062*
Hospital Stay After Operation						
< 7days	48(50.5 %)	6(30.0 %)	I		I	
>= 7days	47(49.5 %)	14(70.0 %)	2.38(0.84,6.73)	0.101	3.82(0.92,15.86)	0.066*
Patient Out of Shock						
Yes	77(81.1%)	10(50.0%)	I		I	
No	18(19.9%)	10(50.0%)	4.28(1.55,11.81)	0.005	2.20(0.58,8.32)	0.245*

**Significant association at p-value <0.25.

Table 13 Multiple logistic regression analysis on perinatal management outcome of uterine rupture.

Variable	Perinatal outcome		COR	P value	AOR	P value
	Favorable (N=4)	Unfavorable (N=111)				
Need Intensive Care Unit Admission						
Yes	1(25.0%)	1(0.9%)	0.03(0.01,0.55)	0.019	0.03(0.001,0.6)	0.022*
No	3(75.0%)	110(99.1%)	I		I	
Patient Come with Referral Paper						
yes	2(50.0%)	74(66.7%)	I		I	
No	2(50.0%)	37(33.3%)	0.50(0.067, 3.69)	0.49	0.55(0.07,4.62)	0.582

*Statistically significant at p-value <0.25

Discussion

Between June 1, 2011-May 31, 2015 in Mizan Aman General Hospital 136patients of uterine rupture were registered, out of that only 115 case are included in the study, 21 case were excluded by exclusion criteria. Card retrieval rate of the study was 84.6%.

A ruptured uterus is a life threatening obstetric complication that remains a major public health concern in low-income countries, particularly in Africa. It is a significant cause of maternal and perinatal morbidity and mortality. In this study the frequency of occurrence for uterine rupture is 1.6 %(1:62.57) which was by far higher when compared with that from a study in Adigrate where the incidence was 1:110, benin 1:315, Pakistan 9:1000, Ghana 1:124 and Dar es Salaam Tanzania 2.25:1000.[1,12–17] The difference could be explained by differences in delivery service coverage, accessibility of the facilities as well as availability of skilled personnel and medical supplies.[18–23]

In this study there were 1(8.3%) intra operative maternal death and 11(91.7%) post-operative death, total maternal death 12 making case fatality rate of uterine rupture 10.4 % with is similar to studies done in Ghana (5.9%), Pakistan (7.8%) and Dar es Salaam Tanzania (12.9%).[16–24]

In this study There were 110(95.7%) still birth and 5(4.3%) of neonate were alive those delivered with instrument and previous uterine scar dehisce and a case fatality rate were 95.7 which similar to study done in Tanzania which were 157 still birth and case fatality rate were 96.3%.[17]

Similar to studies done at Adigrate hospital, 2001, in this study the most common causes were obstructed labor 57(49.6%) flowed by malpresentation and malposition 26(22.6%), previous uterine scar 9(7.8%), 9(7.8%) of patients associated instrumental delivery but contrary to studies done Pakistan common cause were Pitocin induced 33(51.6%), great multiparity 27(42.2%), Previous uterine

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scar 12(18.8%) and obstructed labor 8(12.5%), Ghana most common causes of uterine rupture were Great multiparity 41.5%, Pitocin induced, 24(58.5%), malpresentation and malposition, 5(12.1%), CPD 4(9.8%).[13,15,17] This is may be due to inappropriate use of oxytocin.

The common presenting features of uterine rupture patients at admission in this study were cessation of contraction 90(31.5%) followed by and abdominal pain 85(29.7%) and vaginal bleeding 56(19.6%) and physical findings were 102(37.1%) of patients absent fetal heart beat and followed by easily palpable fetal part 88(32%), shock 72(26.2%) and sepsis 6(2.2%) which is discrepant with study done in Adigrat, 2001 that were abdominal pain 48(88.9%), tachycardia 38(70.4%), hypotension 26(48.1%), coma 2(3.7%), vaginal bleeding 22(40.7%), palpable fetal part 27(50%), abdominal tenderness 45(83.3%), sepsis 10(18.5%) shock 22(40.7%) and Ghana also vaginal bleeding 18(43.9%), palpable fetal part 26(63.4%), abdominal tenderness 14(34.1%), sepsis 12(29.3%) and shock 27(65.5%).[13,24] This may be related to smaller sample size of the study done in Adigrat and Ghana which is half of this study.

In this study among patient with uterine rupture; 103(89.6%) were complete uterine rupture and 12(10.4%) were incomplete rupture which were similar to study done in Adigrate that were 44(81.5%) were complete uterine rupture and 10(18.5%) were incomplete uterine rupture and in Ghana complete and incomplete uterine rupture account 33(80.5%) and 8(19.5%) respectively. In this study anterior lower segment rupture 38(33%) followed by Low vertical uterine 22(19.1%) were by far the most common. Bladder rupture was exclusively associated with cases with rupture of lower uterine segment which is similar with done at Adigrat Hospital(2001) that were lower segment of the uterus 31(57.4%), left lateral 13(24.1%), posterior 4(7.4%), upper segment 3(5.6%), right lateral 3(5.6%), fundal rupture3(5.6%) and Ghana were lower segment of the uterus 9(60%), posterior 4(26.66%), anterior and posterior 2(13.33%), transverse 8(53.33%), longitudinal 9(60 %,anterior 7(46.66%) and others 2(13.33%).[13,24]

In this study the majority of mother treated by repair+bilateral tuba ligation which is discrepant that is done at Adigrat (2001) which were total abdominal hysterectomy 20(37%) and urinary bladder rupture 10(18.5%) and Pakistan (2009) of total abdominal hysterectomy 49(76.6%), repair 15.6%, urinary bladder repaired 3.1%.[13,16] The options of surgical treatment of uterine rupture were depends on various factors; the condition of patients, extent of rupture, presence of infection, the wish for future child bearing capability, experience of surgeons and availability of blood transfusion were the determining factors for decision.

Post-operative wound infection 14(29.2%), fistula 5(10.5%), anemia 6(12.5%) followed by pneumonia 4(8.3%) were common post-operative complication in this study which was also similar to the study done at Adigrate hospital were wound infection 8(16.7%) vesico vaginal fistula 6(12.5%), urinary tract infection 5(10.4%) and pneumonia 2(4.2%).[13]

Limitation of the study

i. Incomplete documentation and inappropriate chart keeping.

ii. Psychological and other long term post-operative problems were not included.

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Conflict of interest

The author declares no conflict of interest.

References

1. Dow M, Wax JR, Pinette MG, et al. Third-trimester uterine rupture without previous cesarean: a case series and review of the literature. *Am J Perinato*. 2009;26(10):739–744.

2. Kenneth J. Obestetric complication. In: Judis S, et al. editors. *William obstetric*. 23rd ed. Sanfransisco, New York, USA; 2011. p. 544–545.

3. Ozdemir I, Yucel N, Yucel O. Rupture of the pregnant uterus: a 9-year review. *Arch Gynecol Obstet*. 2005;272(3):229–231.

4. Porreco RP, Clark SL, Belfort MA, et al. The changing specter of uterine rupture. *Am J Obstet Gynecol*. 2009;200(3):269e1–269e4.

5. Rodriguez MH, Masaki DI, Phelan JP, et al. Uterine rupture: are intrauterine pressure catheters useful in the diagnosis? *Am J Obstet Gynecol*. 1981;161(3):666–669.

6. Ridgeway JJ, Weyrich DL, Benedetti TJ. Fetal heart rate changes associated with uterine rupture. *Obstet Gynecol*. 2004;103(3):506–512.

7. Khabbaz AY, Usta IM, El-Hajj MI, et al. Rupture of an unscarred uterus with misoprostol induction: case report and review of the literature. *J Matern Fetal Med*. 2001;10(2):141–145.

8. Sweeten KM, Graves WK, Athanassiou A. Spontaneous rupture of the unscarred uterus. *Am J Obstet Gynecol*. 1995;172(6):1851–1855.

9. Chauhan SP, Martin JN, Henrichs CE, et al. Maternal and perinatal complications with uterine rupture in 142,075 patients who attempted vaginal birth after cesarean delivery, A review of the literature. *Am J Obstet Gynecol*. 2003;189(2):408–417.

10. Phelan JP, Korst LM, Martin GI. Causation--fetal brain injury and uterine rupture. *Clin Perinatol*. 2007;34(3):409–438.

11. Schrinsky DC, Benson RC. Rupture of the pregnant uterus: a review. *Obstet Gynecol Surv*. 1978;33(4):217–232.

12. Starrs A. *The safe motherhood action agenda, Priorities for the next decade-Report on the Safe Motherhood Technical Consultation*. Colombo, Sri Lanka; 1997. p. 18–23.

13. WHO, UNFPA, UNICEF, World Bank. Reduction of maternal mortality, a joints WHO/UNFPA/UNICEF/World Bank statement. Geneva, Switzerland: WHO; 1999. 40 p.

14. Miller DA, Goodwin TM, Gherman RB, et al. Intra partum rupture of unscarred uterus. *Obstet Gynecol*. 1997;89(5 Pt 1):671–673.

15. Rizwan N, Abbasi NM, Uddin SF. Uterine rupture, frequency of cases and fetomaternal outcome. *J Pak Med Assoc*. 2011;61(4):322–324.

16. Chamiso B. Rupture of pregnant uterus in Shashemene General Hospital, south shoa, Ethiopia (a three year study of 57 cases). *Ethiop Med J*. 1995;33(4):251–257.

17. Choudhry MTM. *Maternal Mortality and quality of Maternity care, implication for Pakistan*. Openmed. NIC; 2005.

18. Amanael G, Mengiste MM. Ruptured uterus-eight year retrospective analysis of causes and management outcome in Adigrat Hospital, Tigray Region, Ethiopia. *Ethiop J Health Dev*. 2002;16(3):241–245.

19. Diallo FB, Idi N, Vangeenderhuysen, et al. Uterine rupture at niamey central maternity reference center, Nigeria. Epidemiologic features and prevention strategies. *Dakar Med*. 1998;43(1):74–78.

20. Ehigiegbaa E, Adeyemoa IS. Uterine rupture in labour. A continuing obstetric challenge in developing countries - the benin experience. *CMS UNIBEN JMBR*. 2006;5(1):44–50.

Maternal and perinatal outcomes of uterine rupture patients among mothers who delivered at mizan aman general hospital, SNNPR, south west Ethiopia; a five year retrospective hospital based study

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21. Qazi Q, Akhtar Z, Khan K, et al. Woman Health, Uterus Rupture, Its complications and management in teaching hospital Bannu, Pakistan. *Maedica (Buchar)*. 2012;7(1):49–53.

22. Kidantou HL, Mwampagatwa I, Van Roosmalen J. Uterine rupture: Retrospective analysis of causes, complications and management outcomes at Muhimbili National Hospital in Dar es Salaam, Tanzania. *Tanzan J Health Res*. 2012;14(3):220–225.

23. Fofie C, Baffoe P. A two-year review of uterine rupture in a regional hospital. *Ghana Med J*. 2012;44(3):98–102.

24. Ethiopian Demographic Health Surveys (EDHS 2011) report; 2011.