PREVALENCE AND FACTORS ASSOCIATED WITH MANAGEMENT OUTCOME OF UTERINE RUPTURE AT WOLLISO SAINT LUKE CATHOLIC HOSPITAL, OROMIA REGIONAL STATE, SOUTHWEST SHOA ETHIOPIA

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ABSTRACT

INTRODUCTION: Uterine rupture is a life threatening obstetric complication of pregnancy. It is a major public health problem in developing countries. In Ethiopia maternal and perinatal mortality due to uterine rupture is very high. Thus studying the factors associated with management outcome of uterine rupture in our context is important to implement appropriate preventive measures as well as to give recommendation to relevant concerned bodies.

OBJECTIVE: The objective of the study was to assess prevalence and factors associated with management outcome of uterine rupture at Wolisso Saint (St.) Luke Catholic Hospital.

METHODS: Hospital based retrospective cross-sectional study was conducted at Wolisso St. Luke Catholic Hospital from January 1,2009 to December 31,2013 by reviewing medical records using a prepared checklist. Percentage was used to review the prevalence of uterine rupture and logistic regression was carried out to analyze the association between dependent and independent variables. $P< 0.05$ was considered as statistically significant.

RESULT: The analysis revealed that 151 cases of uterine rupture among 14,152 deliveries, the prevalence being 1.07% during the study period. A total of 90 cases were analyzed. Majority (67.8%) was multigravids, 96.7% were from rural area, 63.3% had prolonged duration of labor and 53.3% were unbooked. The causes of uterine rupture were obstructed labor due to cephalo-pelvic disproportion (42.2%) and malpresentation/malposition (37.8%), previous cesarean scar (15.6%), instrumental deliveries (3.3%), and induction with pitocin (1.1%). Rupture after hospital admission observed in 13.3% of cases. Uterine repair with bilateral tubal ligation was performed in 40%, total abdominal hysterectomy in 26.7%, repair only in 24.4%, and subtotal abdominal hysterectomy in 8.9% of the cases. Forty five (50%) mothers developed post-operative complications. Of those anemia (33.3%) was the commonest. Fetal and maternal case fatality rate was 94.4% and 4.4% respectively. Women who presented with un-recordable blood pressure are 4.1 times more likely to have a bad maternal outcome than those who presented with recordable blood pressure [AOR=4.1; 95%CI (1.25-13.4), P-value=0.02]. Neonates born from mothers who had previous cesarean scar have 22.5 times more likely to be alive than those born from mothers who had no previous cesarean scar [AOR=22.5; 95%CI (1.91-266.36), P-value=0.013].

CONCLUSION AND RECOMMENDATION: The prevalence of uterine rupture is high with significant perinatal and maternal morbidity and mortality. The commonest underline cause was obstructed labor. The commonest surgical intervention was repair with bilateral tubal ligation. Blood pressure had significant association with maternal outcome. Previous cesarean scar had significant association with neonatal outcome. Therefore clinicians should detect early warning signs of uterine rupture, increase health service coverage and improve quality of service will improve uterine rupture related perinatal and maternal morbidity and mortality.

KEY WORDS: Uterine rupture, hysterectomy, Wolisso St. Luke Catholic Hospital.

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Acronyms

AOR	Adjusted Odds Ratio
ANC	Ante Natal Care
BP	Blood pressure
ART	Anti Retrovirus Therapy
C/S	Cesarean section
COR	Crude Odds Ratio
FHB	Fetal Heart Beat
PMTCT	Prevention of Mother To Child Transmission
SPSS	Statistical Package for Social Science
VBAC	Vaginal Birth After Cesarean section
VCT	Voluntary Counseling and Testing
WHO	World Health Organization

CHAPTER ONE

Introduction

1.1. Background

Uterine rupture is a life threatening obstetric complication of pregnancy associated with severe maternal and fetal morbidity and mortality. It is a complete separation of uterine musculature through all of its layers with all or part of the fetus, placenta or both being extruded from uterine cavity. It may be spontaneous, traumatic or associated with prior uterine scar and may occur before or during labor, or at the time of delivery. Ruptured uterus still remains one of the serious obstetric complications. Lack of health information, illiteracy, poor antenatal care follow-up, poverty, home deliveries, and delay in referrals all contribute to uterine rupture (1,2).

The incidence of ruptured uterus varies in different parts of the world. It is rare in developed countries as 0.086% in Australia 0.023% in Ireland. Whereas in developing countries as frequent as 0.63% in Yemen, 0.57% in Ethiopia, and 0.45% in Morocco. Uterine rupture has different causes unlike in the developed world where excessive and prolonged use of oxytocin in the presence of scarred uterus is the major cause, in less developed countries feto-pelvic disproportion, causing obstructed labor, is the major cause of uterine rupture. Obstructed labor is leading cause of maternal illness and death in the Sub-Saharan Africa and South Asia. Uterine rupture is the immediate cause of maternal morbidity and mortality also with long term sequel (3, 4,5).

Rupture of uterus may occur spontaneously as a result of obstructed labor to feto-pelvic disproportion, malposition and malpresentation. Traumatic rupture occurs commonly because of motor vehicle accident, uterotonic agent, inept attempt at operative vaginal delivery, and obstetrics maneuvers. The vast majority are associated with prior uterine surgery like previous cesarean delivery or myomectomy (6).

Although it is not possible to predict which women are likely to experience a uterine rupture while laboring for a Vaginal Birth After Cesarean section (VBAC), recent studies suggest that the risk for uterine rupture is somewhat higher when labor is induced with misoprostol for women who plan VBAC, single-layer closure of prior cesarean incision, VBAC within less than

18 to 24 months after a prior cesarean, age older than 30 years, classical uterine incision, two or more prior Cesarean Section (C/S), and VBAC after the 40^{th} week of pregnancy (7).

Uterine rupture is associated with both fetal and maternal clinical manifestations. A non-reassuring fetal heart rate pattern is the most common fetal finding, including variable and late decelerations, followed by bradycardia. Maternal manifestations are vaginal bleeding, sharp pain between contractions, contractions that slow down or become less intense, unusual abdominal pain or tenderness, recession of the fetal head, maternal tachycardia and hypotension (7).

Delay in management places both mother and fetus at significant risk. Major maternal complications are hemorrhage, shock, post-operative infections, bladder damage, ureteric damage, thrombophlebitis, amniotic or pulmonary embolism, disseminated intravascular coagulation and death. Different modes of management are being practiced, namely repair of the uterine tear, total abdominal hysterectomy and subtotal abdominal hysterectomy. The preference of management and outcome varies in different centers (6, 8).

1.2. Statement of the Problem

More than 150 million women become pregnant in developing countries each year. About fifteen percent of all pregnancies will result in complications and an estimated 520,000 will die from pregnancy related causes. Most of the maternal deaths are due to hemorrhage, obstructed labor, infection (sepsis), unsafe abortion and eclampsia (pregnancy induced hypertension) (9).

High maternal mortality and morbidity rate is a consequence of poor maternal care, inadequate socioeconomic and environmental conditions, poor accessibility to health services and poor nutrition habits. Maternal mortality has been identified as a major public health problem in the developing world and various strategies to reduce it have been proposed and implemented by national governments and WHO for almost three decades. The primary health care strategy, the safe motherhood initiative, and later, the mother-baby package are a few of these (3, 10).

In developing countries where maternal mortality rate is100-200 times higher than Europe and North America 10% of maternal deaths are due to uterine rupture. Ethiopia is one of the developing countries where maternal and perinatal mortality rates are still very high. The maternal mortality ratio in Ethiopia is one of the highest in sub-Saharan African, 676/100,000 live births according to Ethiopian 2011 DHS data (4, 11).

The high maternal morbidity, maternal mortality and fetal mortality that follow uterine rupture calls for an integrated effort to prevent causes. Good ANC, family planning services, prompt referral of obstructed labor, availability of transportation and obstetric care are the essential factors to prevent uterine rupture and to decrease the maternal mortality, fetal mortality and maternal morbidity associated with it (12).

However, little is known about incidence and factors associated with management outcome of uterine rupture. Particularly in the current study area, there is no any study conducted that has assessed the incidence and factors associated with management outcome of uterine rupture. Accordingly, the purpose of this study is to describe and analyze the prevalence and factors associated with management outcome of uterine rupture at Woliso St. Luke Catholic Hospital.

CHAPTER TWO

2.1 Literature Review

A retrospective study was carried out in the Department of Obstetrics and Gynecology in a tertiary health care center, India from January 2002 to December 2006.The total uterine rupture cases were 0.17%. The incidence of uterine rupture was 0.17%. Majority of the patients belonged to age group 30-34 years and were multiparas. Most of the cases were due to obstructed and neglected labor, 52.63%, 35.08% due to scar rupture, and 8.77% were due to uterine trauma. The bladder injuries were found in 8.77%. Repair of the uterine rent was possible in 70.18% cases. Hysterectomy was done in 29.82% cases. Stillbirths were observed in 94.74% of women with uterine rupture. There was no maternal mortality (13).

A5 years retrospective study done in Abha General Hospital, Abha, Saudi Arabia, out of a total of 34,590 deliveries 33 cases of uterine rupture were observed with the incidence of 1:1048(0.09%). Majority of the cases (73%) were unbooked. Important risk factors were previous cesarean scar (88%) and grandmultiparity (80%). Most of the patients were in their 30's. The frequency of complete and incomplete uterine rupture was almost the same (52 and 48% respectively). Total abdominal hysterectomy was required in 9 (27%), repair in 23 (70%) and 1 (3%) underwent subtotal hysterectomy. None of patients agreed for tubal ligation. Seven (21%) cases were associated with bladder injury and three (9%) had vascular injury. There were no maternal mortality,11 (33%) interauterine fetal deaths and alive birth rate was 67% (14).

A systematic review of all available data since 1990 was evaluated by World Health Organization (WHO) which was community-based and facility-based reports from urban and rural studies worldwide. Eighty-three reports of uterine rupture rates are included in the systematic review. Most are facility based using cross-sectional study designs. The prevalence figures for uterine rupture were available for 86 groups of women. For unselected pregnant women, the prevalence of uterine rupture reported was considerably lower for community-based (median 0.053, range 0.016–0.30%) than for facility-based studies (0.31, 0.012–2.9%). The prevalence tended to be lower for countries defined by the United Nations as developed than the less or least developed countries. For women with previous caesarean section, the prevalence of uterine rupture reported was 1%. Only one case of uterine rupture reported for women without

previous caesarean section, from a developed country, and this was extremely low (0.006%) (15).

For less and least developed countries, uterine rupture is a more prevalent and serious problem. The most important shortcoming of the data available is the lack of differentiation between uterine rupture with and without previous caesarean section. Overall, most rates ranged between 0.1% and 1%. Reports from Nigeria, Ghana, Ethiopia and Bangladesh indicated that about 75% of cases of uterine rupture were associated with unscarred uterus. Maternal mortality ranged between 1% and 13%, and perinatal mortality between 74% and 92% (15).

In a population-based cohort study in all 98 maternity units in the Netheralnds of women delivering between August 2004 and August 2006, there were 210 cases of uterine rupture (5.9 per 10,000 pregnancies). Of these women, 183 (87.1%) had a uterine scar, incidences being 5.1 and 0.8 per 10,000 in women with and without uterine scar. No maternal deaths and 18 cases of perinatal death (8.7%) occurred. The overall absolute risk of uterine rupture was 1 in 1709. In univariable analysis, women with a prior caesarean, epidural anesthesia, induction of labor (irrespective of agents used), pre or post term pregnancy, overweight, non-Western ethnic background and advanced age had an elevated risk of uterine rupture. The overall relative risk of induction of labour was 3.6 (95% confidence interval 2.7-4.8) (16).

A descriptive case series was conducted at the Department of Gynaecology and Obstetrics, Liaquat University of Medical & Health Sciences, Jamshoro from January 2008 to December 2008. The total number of deliveries was 2010. There were 15 cases (0.74%) of uterine rupture. Most of the patients (60%) presented between the ages 26-30. Majority of uterine rupture occurred in para 2-4, (53.33%).Common cause of uterine rupture was prolonged neglected obstructed labour. Previous caesarean section scar was found in 41.66%. Anterior uterine wall was involved in 60% of cases. Rupture was complete in 73.33% of cases. Hysterectomy was performed in 53.33%. There were three maternal (20%) and 11 intrauterine deaths (73.33%). Live birth rate was 26.66 % (17).

A prospective descriptive study was conducted in Department of Obstetrics and Gynecology, unit-II Liaquat University Hospital Hyderabad Sindh Pakistan from 1st October 2010 to 31st March 2011. During the study, 34 patients out of 1400 deliveries presented with uterine rupture

resulting in a frequency of 2.42% or 1: 41deliveries.Patients with 64.7% (22) were between 26 to 35 years age and 67.64% (23) were multipara, 26.47% (9) presented with extension of tears, 17.6% (6) with shock, 20.5% (7) with septicemia and 20.5% (7) with wound infection (18).

A United Kingdom national case-control study was undertaken between April 2009 and April 2010. The participants comprised 159 women with uterine rupture and 448 control women with a previous caesarean delivery. The estimated incidence of uterine rupture was 0.2 per 1,000 maternities overall; 2.1 and 0.3 per 1,000 maternities in women with a previous caesarean delivery planning vaginal or elective caesarean delivery, respectively. Amongst women with a previous caesarean delivery, odds of rupture were also increased in women who had ≥ two previous caesarean deliveries (adjusted odds ratio [AOR] 3.02, 95% CI 1.16–7.85) and <12 months since their last caesarean delivery (AOR 3.12, 95% CI 1.62–6.02). A higher risk of rupture with labour induction and oxytocin use was apparent (AOR 3.92, 95% CI 1.00–15.33). Two women with uterine rupture died (case fatality 1.3%, 95% CI 0.2–4.5%). There were 18 perinatal deaths associated with uterine rupture among 145 infants (perinatal mortality 124 per 1,000 total births, 95% CI 75–189 (19).

Out of 72,570 total deliveries at Muhimbili National Hospital in Dare Salaam, Tanzania, 163 cases of ruptured uterus were recorded in seven years, making an incidence of 2.25 per1000 births. Most ruptures (38%) resulted from neglected obstructed labour and scared uterus (33.6%).Major obstetric hemorrhage (>1500 ml) was the most frequently encountered complication followed by sepsis. Subtotal hysterectomy was the most common (73.6%) surgical intervention. Maternal and perinatal case fatality rates were 12.9%, and 96.3% respectively. Ruptured uterus contributed to 6.6%of all maternal deaths (20).

A 10-year retrospective study conducted in Nnamdi Azikiwe University Teaching Hospital, Nnewi, Nigeria between 1st January, 2001 and 31st December, 2010. Out of 5,585 deliveries over the study period, 47 had uterine rupture, giving an incidence of 0.84% or 1 in 119 deliveries. All the patients were multiparous and majority (63.8%) was unbooked. Traumatic (iatrogenic) rupture predominated (72.1%). Uterine repair with (55.8%) or without (34.9%) bilateral tubal ligation was the commonest surgery performed. Case fatality rate was 16.3%, while the perinatal mortality rate was 88.4%. Average duration of hospitalization following uterine rupture was 10.3 days.(21)

Case–control design of women with uterine rupture during 2005–2006, at Mbarara Regional referral Hospital in Western Uganda, a total of 83 cases of uterine rupture out of 10940 deliveries were recorded giving an incidence of uterine rupture of 1 in 131 deliveries. Predisposing factors for uterine rupture were previous cesarean section delivery(Odds Ratio (OR) 5.3 95% CI 2.7-10.2), attending < 4 antenatal visits (OR 3.3 95% CI 1.6-6.9), parity ≥ 5(OR 3.67 95% CI 2.0-6.72), no formal education (OR 2.0 95% CI 1.0-3.9), use of herbs (OR15.2 95% CI 6.2-37.0), self referral (OR 6.1 95% CI 3.3-11.2) and living in a distance >5 km from the facility (OR 10.86 95% CI 1.46-81.03). There were 106 maternal deaths during the study period giving a facility maternal mortality ratio of 1034 /100,000 live births, there were 10 maternal deaths due to uterine rupture giving a case fatality rate of 12% (22).

A descriptive retrospective study in Upper West Regional Hospital, Wa, Ghana, from 1st January,2007 to 31st December 2008.In a descriptive retrospective study in Upper West Regional Hospital, Wa, Ghana from 1st January 2007 to 31st December 2008, there were 5085 total deliveries with 4172(82%) spontaneous vaginal delivery and 911(17.9%) caesarean sections. Uterine rupture occurred in 41 cases for a ratio of 1:124. Grand multipara with five or more deliveries represented 41.5% while those with two prior successful deliveries represented 31.7%. The mean parity was 3.8 (SD 2.3) under antenatal care, 85.4% had at least four visits. Severe anaemia 28(68.3%) and abdominal tenderness 27(65.8%) were the most frequent clinical presentations Use of local herbal concoction with suspected uterotonic activity 24(58.5%), feto-pelvic disproportion 4 (9.8%) and malpresentation 5(12.1%) were the most significant causes. Major complications were neonatal deaths 34(82.9%), maternal mortality 4(9.8%) and wound infections 15 (36.6%). Subtotal hysterectomy 10(24.4%) and total hysterectomy 18(43.8%) were preferred to uterine repair 12(23.3%) and 87.8% required at least two units of blood transfusion (23).

A two year prospective analysis from September 1996 to August 1998 from Debre Markose hospital -Ethiopia of all laparotomy proven cases of ruptured uterus was done. There were a total of 1830 deliveries and seventy uterine rupture cases. Frequency of occurrence of uterine rupture was 3.8% i.e. one in 26 deliveries. The peak incidence of uterine rupture was observed in women between 25 to 29 years. Mean parity was 3.6 and grand multiparas (>5) accounted for most (34.2%). Intraoperatively 62 of the patients were found to have complete and eight incomplete

rupture with 54.3% anterior rupture. Hysterectomy was done for 57 and repair for 13 women. The postoperative complication rate was 24.3%, sepsis being the most common cause of death (24).

A total of 54 cases of ruptured uterus and 5,980 hospital deliveries for a ratio of 1:110 were recorded from Adigrat zonal hospital Ethiopia. Causes of rupture were cephalopelvic disproportion (CPD) (53.7%), malpresentation and malposition (25.9%), instrumental delivery (3.7%), pitocin induced labor (3.7%) and uterine scar (11.2%). Most were multipara and rupture was complete in 94.4%. Site of rupture was in lower uterine segment in 58.5% and left lateral in 24.5%. Ten cases (18.5%) had associated bladder injury. Total abdominal hysterectomy was performed in 20 (37%), subtotal abdominal hysterectomy in 13 (24.2%) and repair in 21 (38.9%) cases. Vesicovaginal fistula and wound infection were common post-operative complications. Maternal case fatality rate was 11.1% and fetal case fatality rate was 98.1%. Ruptured uterus contributed 24% of all causes of maternal deaths in the hospital within the study period (25).

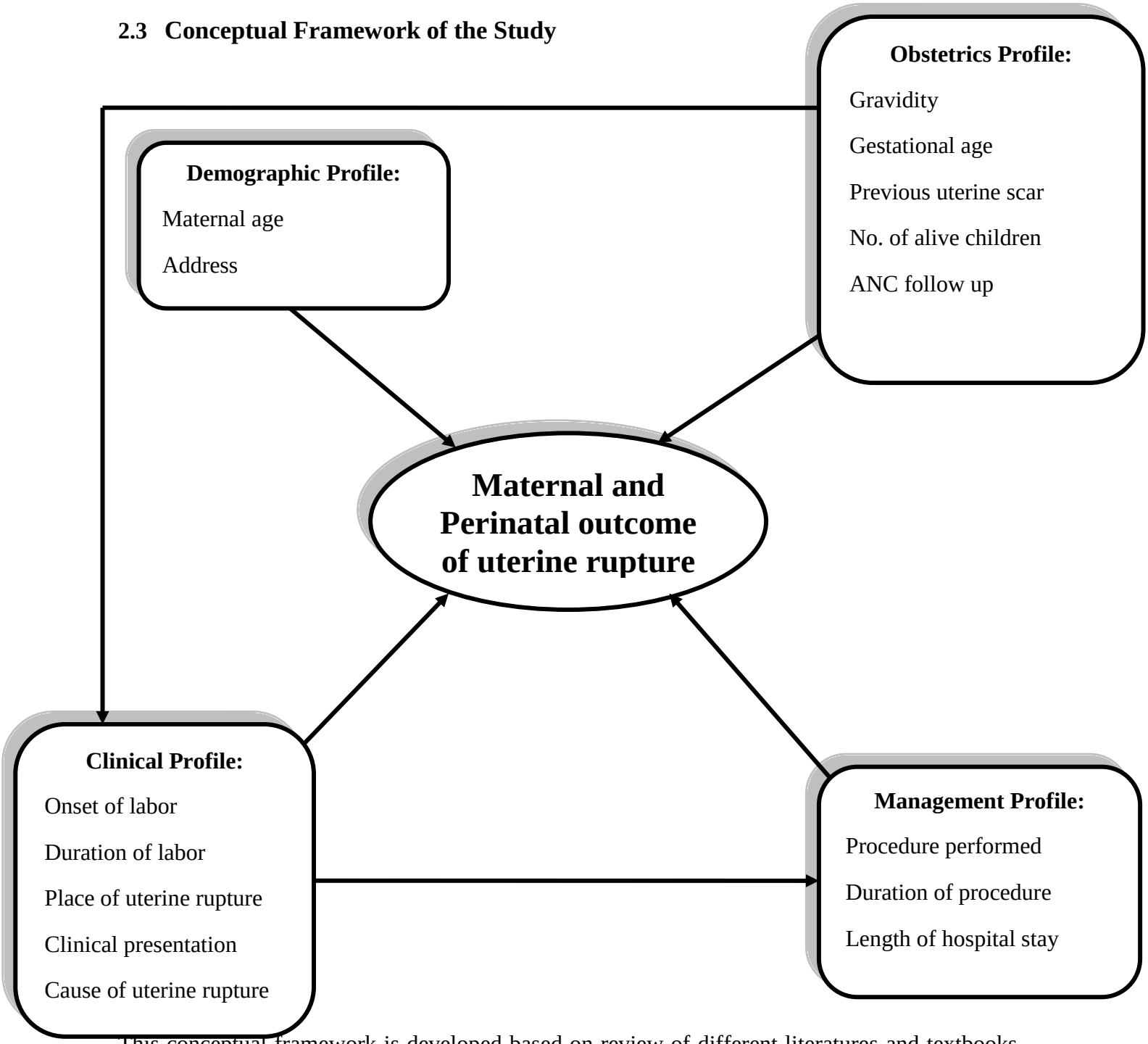
A retrospective study done in Yirgalem General Hospital, Yirgalem, Ethiopia, from August 2011 to January 2013. A total of 92 cases were identified and the frequency of ruptured uterus was 5%, giving an incidence of 1 in 19 deliveries. The mean age was 27 and the mean parity P3. Only 23% of patients received antenatal care. 64% of patients self referred after laboring at home unattended. The average length of labor prior to arrival was 20 hours and the average distance travelled was over 40 kilometres. Eighty percent of patients arrived in the second stage of labor. All neonates were stillborn. Seventy four percent of patients underwent a hysterectomy. The uterus was reparable in 26% of cases accompanied often with bilateral tubal ligation. Average blood loss was 1500mls and 22% of patients received a blood transfusion. 6% of mothers died post operatively and a further 15% suffered significant post-operative complications (26).

In the current study area there is no published study conducted on the incidence and factors associated with management outcome of uterine rupture. And the present study aimed at describing prevalence and factors associated with management outcome of uterine rupture in Wolisso St.Luke Hospital.

2.2 Significance of the Study

This study aims to assess the prevalence and factors associated with management outcome of uterine rupture. The result of this study will help Wolisso health department and St. Luke Hospital and other concerned bodies to design appropriate strategies that will prevent or reduce uterine rupture related maternal and fetal morbidity and mortality in the study setting and the community at large. The study will also help as a baseline for further studies in the future.

2.3 Conceptual Framework of the Study



This conceptual framework is developed based on review of different literatures and textbooks. The arrows in the framework indicate the association between the boxed factors and the outcome variable of the study.

Figure 2.1 Conceptual framework

CHAPTER THREE

Objective

3.1. General Objective

To review the prevalence and factors associated with management outcome of uterine rupture in the past five years at Wolisso St. Luke Catholic hospital Oromia Regional State, SouthWest shoa, Ethiopia.

3.2. Specific Objectives

1. To determine the prevalence of uterine rupture
2. To asses underline causes and management outcomes for uterine rupture
3. To identify factors affecting feto-maternal outcomes

CHAPTER FOUR

Methodology

4.1. Study Area and Period

The study was carried out in Wolisso St. Luke Catholic Hospital from March 1-30 2014 over five year retrospective study. Wolisso is the capital of South Western Shoa Zone and located 115 kilo meter (km) from Addis Ababa. Currently, it is providing full health care services for the population of Wolisso town and its surroundings estimated to be over 1.2 million people. Wolisso St. Luke Catholic Hospital is owned by Ethiopia Catholic Church and began service on January 2001.There are two Government Hospitals near Wolisso in Tulu Bolo, 35 km away and in Ambo,(West Shoa Zone) 65 km from Wolisso. Attat Hospital in the Guragae Zone (Southern people's Region) is 60 km from Wolisso. There are a total of 409 staffs (220 are health professionals).There are 2 surgeons,1 gynecologist,1 internist,1 opthalmologist,1 pediatrician, and 3 general practitioners/dentists. There are 200 beds in use; 14 beds in gynecology ward, 24 beds in maternity ward and 11 beds in obstetrics unit (3 waiting beds, 5 first stage, and 3 second stage beds).The hospital serves the community in each department (medical, surgical, ophthalmology, Orthopedic, physiotherapy, psychiatric, ultrasound and X-ray, laboratory services, VCT, ART services /PMTCT, chronic care and ANC follow up services). There is also maternal waiting area for high risk mothers.

4.2. Study Design

A facility based cross-sectional retrospective study was conducted to review incidence and factors associated with management outcome of uterine rupture at Wolisso St. Luke Catholic hospital in the past five years.

4.3. Population

4.3.1. Source Population

All records of pregnant women admitted for delivery at Wolliso St. Luke Catholic hospital from January 1, 2009 to December 31, 2013.

4.3.2. Study Population

All records of pregnant women with a diagnosis of uterine rupture at Woliso St. Luke Catholic hospital from January 1, 2009 to, December 31, 2013.

4.3.3. Inclusion & Exclusion Criteria

Inclusion Criteria:

All records of pregnant women with a diagnosis of uterine rupture.

Exclusion Criteria:

All records of pregnant women with incomplete recorded information on uterine rupture.

4.4. Sample Size and Sampling Technique

4.4.1. Sample Size

The records of all of 90 women with a diagnosis of uterine rupture at Wolisso St. Luke Catholic hospital during the past five years.

4.4.2. Data Collection Method

All records (delivery registration book and all operative records from operation log book) of women who came for delivery were reviewed to identify those women managed for uterine rupture from January1, 2009 to December 31, 2013.The cards were collected from card room using medical record number. Based on the inclusion and exclusion criteria of the study, cards were selected for revision.

4.5. Study Variables

4.5.1. Dependent Variables

- Maternal Outcome
- Perinatal Outcome

4.5.2. Independent Variables

- Age
- Address
- Gravidity
- ANC follow-up
- Gestational age
- Onset of labor
- Duration of labor
- Place of rupture
- Previous cesarean scar
- Clinical presentation
- Cause of uterine rupture
- Intra operative findings
- Procedure done
- Duration of procedure
- Length of stay

4.6. Data Collection Instruments and Procedure

Review checklist was developed after review of literatures. Two midwifery nurses were involved in the process of data collection. Adequate information was given to them on how to fill the checklist. The data collection procedure was carried out by reviewing the records of patients. Timely supervisions were undertaken by the principal investigator during the process of data collection.

4.7. Data Quality Control

Before actual data collection, the checklist was pre-tested on 5% of similar records from Attat Hospital. Possible amendments were made to the tool based on the findings of the pre-test. Appropriate data collection techniques were followed during the process of data collection. Finally, crosschecking was made between data obtained from operation room books with that of patients' cards.

4.8. Data Processing, Analysis and Interpretation

Data were entered and analyzed using SPSS version 16.0 windows soft ware computer program and interpreted with frequencies, rates, and percentages. Bivariate logistic regression analysis was made to obtain odds ratio and the confidence interval of statistical associations. Then, to control the confounding effect of other variables and to determine associated factors on feto-maternal outcomes among uterine rupture cases, enter method multivariate logistic regression analysis was carried out by taking significant variables in the bivariate logistic regression model. The strength of statistical association was measured by adjusted odds ratios (AOR) and 95% confidence intervals. Statistical significance was declared at $P < 0.05$. Results of the study were presented in tables, graphs and pie charts accordingly.

4.9. Operational Definitions

1. **Bad outcome**:- Pregnant women with a clinical diagnosis of uterine rupture improved and discharged from the hospital and developed no postoperative complication,
2. **Combined site of uterine rupture:-** When uterine rupture occurs in more than one uterine sites.
3. **Good outcome**:- Pregnant women with a clinical diagnosis of uterine rupture who have died in the pre-, intra- or post-operative period, Or

   Pregnant women with a clinical diagnosis of uterine rupture who improved but developed one or more postoperative complication(s).
4. **Other types of previous cesarean scar:-** Women who have previous cesarean delivery and the type of scar were Classic, low vertical, inverted T or J-shaped.

4.10. Limitation of the Study

Incomplete documentation and missing patient charts

Smaller sample size to determine significantly associated factors.

4.11. Ethical Consideration

Ethical permission was obtained from Ethical Clearance Board of Jimma University to undertake the research. Official letter was written to Wolisso St. Luke Catholic Hospital to have permission for data collection and data collection was started following official permission from the hospital.

4.12. Dissemination of Results

After obtaining the approval from Jimma University College of Public Health and Medical Sciences, the findings of this research will be disseminated to:

- Jimma University College of Public Health and Medical Sciences
- Jimma University College of Public Health and Medical Sciences Gyn-obs Department
- Wolisso St. Luke Catholic Hospital

CHAPTER FIVE

Result

A total number of deliveries during the study period were 14,152. There were 151 cases of uterine rupture with a prevalence of 1.07%. Sixty one were excluded because of incomplete documentation and missing of the cards. A total of ninety (90) uterine rupture were included for final analysis.

5.1 Demographic factors

The majority of women 66.7% (60/90) with uterine rupture were from age group of 19-34. In addition, most 96.7% (87/90) of the uterine rupture was observed in the cases that came out of Wolisso town (Table 1).

Table 5.1 Age distribution of study subjects at Wolisso St.Luke Catholic Hospital from January 2009 to December 2013.

	Frequency	Percentage (%)
Age in years		
≤18	8	8.9
19-34	60	66.7
≥35	22	24.4
Address		
In Wolisso town	3	3.3
Out of Wolisso town	87	96.7

5.2 Obstetric Profile

Of the 90 cases 67.8% of them were multigravid, 30% were grandmultigravid and 2.2% were primigravid. According to the previous live children data 90% were have one or more alive children whereas 10% had no any alive child. The highest (80%) number of rupture was occurred in term pregnancy and the rest 20% were in post-terms.

Forty eight (53.3%) mothers did not have any antenatal care follow up and the rest (46.7%) had the follow up. Eighty four percent (76/90) of the mothers had no previous cesarean scar whereas 15.6% had previous cesarean scar. Of the 14 of the cases with previous cesarean scar most of

them (57.1%) were have scar on the lower uterine segment, whereas 42.9% of them had other types of previous cesarean scar.

5.3- Clinical Profile

The onset of labor was spontaneous in 98.9% of the cases and induction with pitocin was done for one (1.1%) case. In 63.3% of the mothers labor had lasted for more than 24 hours while it was less than 24 hours in 36.7%. Eighty seven percent (78/90) of cases presented with sign of rupture at admission while 13.3% were having rupture after hospital admission. Cessation of fetal movement was the main compliant in 78.9% of cases, abdominal pain in 77.8% and vaginal bleeding in 64.4% of the cases. Twenty three percent (21/90) of the mothers came with un-recordable Blood Pressure (BP). Fetal Heart Beat (FHB) were heard in 12.2% cases at the time of admission. Most of the cases were having abdominal tenderness and absence of uterine contraction.

Table 5.2 Distribution of clinical presentation of study subjects at Wolisso St.Luke Catholic Hospital from January 2009 to December 2013.

Clinical signs and symptoms		Frequency	Percentage(%)
Cessation of fetal movement	Yes	71	78.9
	No	9	10
Constant abdominal pain	Yes	70	77.8
	No	17	18.9
Vaginal bleeding	Yes	58	64.4
	No	31	34.4
BP	Recordable	21	23.3
	Un-recordable	69	76.7
FHB	Negative	79	87.8
	Positive	11	12.2
Abdominal tenderness	Yes	82	91.1
	No	6	6.7
Uterine contraction	Yes	7	7.8
	No	83	92.2

Easily abdominally palpable fetal parts	Yes	55	61.1
	No	26	28.9

The underline causes were obstructed labor due to cephalo-pelvic disproportion and malpresentation/malposition, previous cesarean scar, obstetric maneuvers and induction/augementation. Where obstructed labor due to cephalo-pelvic disproportion was the leading cause (42.2%).

Table 5.3 Distribution of cause of uterine rupture in study subjects at Wolisso St.Luke Catholic Hospital from January 2009 to December 2013.

Cause	Frequency	Percentage (%)
Cephalo-pelvic disproportion	38	42.2
Malpresentation/Malposition	34	37.8
Previous C/S scar	14	15.6
Obstetric maneuver	3	3.3
Induction/Augmentation	1	1.1

5.4 Management Profile

Rupture were complete in 86 (95.6%) and in 4 (4.4%) rupture were incomplete. In 41.4% of cases the rupture occurred in lower uterine segment. Repair with or without bilateral tubal ligation (36 with, 22 without) was done for 64.4% of cases.

Table 5.4 Site of uterine rupture distribution in at Wolisso St.Luke Catholic Hospital of study subjects from January 2009 to December 2013.

Site of uterine rupture	Frequency	Percentage
Lower uterine segment	37	41.1
Combined sites	21	23.3
Lateral(right or left)	11	12.2
Posterior	11	12.2
Fundal	10	11.1

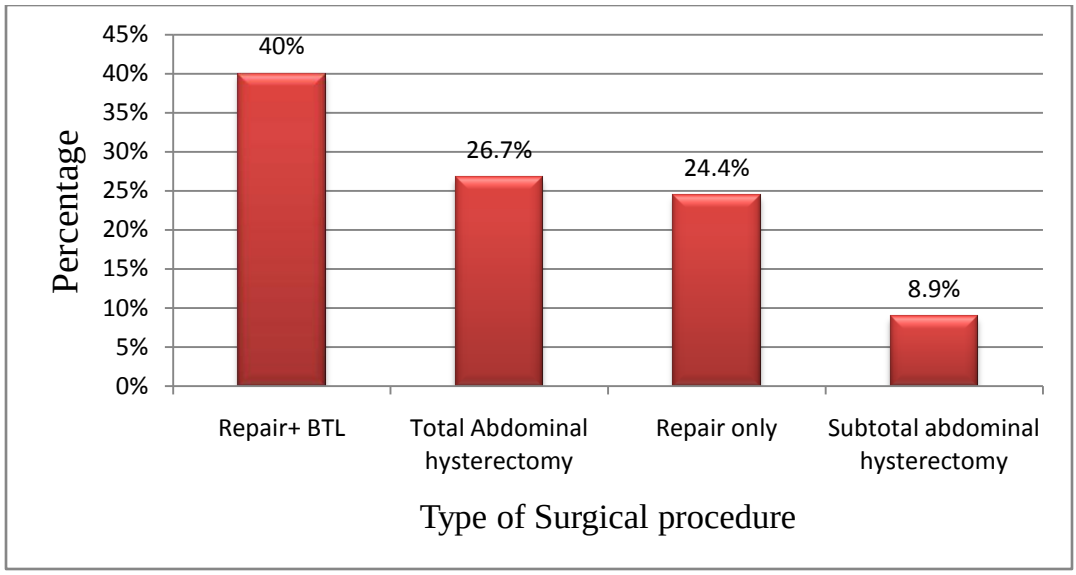


Figure 5.1 Type of surgical procedure distribution in at Wolisso St.Luke Catholic Hospital of study subjects from January 2009 to December 2013.

Majority (73.3%) of women were not having associated organ injury during the rupture, whereas 26.7% had associated organ injury**.** The commonest injured organ was vagina + cervix in 16.7% of cases. Upon operation ureteric injuries occurred in 2.2% of case and the rest 97.8% did not have intra operative accident.

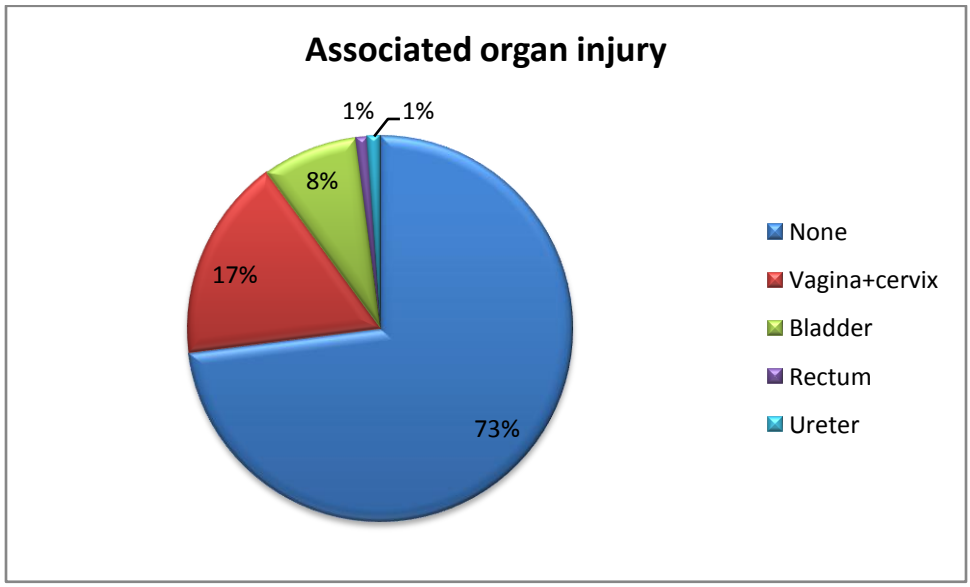


Figure 5.2 Associated organ injuries during uterine rupture Wolisso St. Luke Catholic Hospital from January 2009 to December 2013.

The surgery lasted less than 60 minute in 57.8% and more than 60 minute for 42.2% of cases. Fifty percent (45/90) of women were having bad maternal outcome, of those 41(91.1%) improved but develop one or more postoperative complication and 4(8.9%) women died after surgery. Regarding fetal outcome 85 (94.4%) babies were still born and 5(5.6%) babies delivered alive. There was no early neonatal death.

Table 5.5 Maternal and neonatal outcome in Wolisso St. Luke Catholic Hospital from January 2009 to December 2013.

Outcome		Frequency	Percentage (%)
Maternal	Good	45	50
	Bad	45	50
Neonatal	Dead	85	94.4
	Alive	5	5.6

Among the women who developed post operative complications (45/90), anemia was the commonest in 33.3% of cases. Among the anemic cases 8(53.3%) women got blood transfusion and the rest 46.6% were not transfused. (Table 5.6)

Table 5.6 Postoperative complications in study subjects at Wolisso St.Luke Catholic Hospital from January 2009 to December 2013.

Post operative complication	Frequency	Percentage (%)
Anemia	15	33.3
Wound site infection	10	22.2
Wound dehiscence	8	17.8
Paralytic illus	5	11.1
Vesico vaginal fistula	3	6.7
Pneumonia	3	6.7
Pelvic collection	1	2.2

Around 56.7% of women discharged within 7 days of hospital admission, 33.3% of women stays for 8 to 13 days and the rest 10% discharged after fourteen or more days of hospital stay.

5.5 Factors Affecting Feto-Maternal Outcomes of uterine rupture

Measure of association was performed to test the association between each independent variable with dependent variables, maternal and fetal outcomes of uterine rupture, by binary logistic regression with P-value < 0.25 and those which full fill the criteria analyzed by multiple logistic regression.

Age, presence of previous cesarean scar, time of uterine rupture, blood pressure, type of surgical intervention and duration of procedure was candidates for multiple logistic regression analysis for maternal outcome.

Table- 5.7 Binary logistic regression on factors associated with maternal outcomes of uterine rupture in Wolisso St. Luke Catholic Hospital from January 2009 to December 2013.

Variable		Outcome		COR(95% CI)	AOR(95% CI)
		Good	Bad		
Age	<35	37	31	2.29(0.789-6.644)	1
	>=35	8	14		2.5(0.85-7.39)
Presence of previous C/S scar	Yes	5	9	2(0.613-6.524)	1
	No	40	36		1.45(0.35-6.04)
Duration of labor	<24 hours	12	21	2.41(0.995-5.818)	1
	≥24 hours	33	24		1.71(0.59-4.9)
Place of uterine rupture	Before admission	41	37	2.16(0.616-7.97)	1.79(0.5-7.8)
	After admission	4	8		1
Blood Pressure	Recordable	16	5	4.41(1.451-13.422)	1
	Un-recordable	29	40		4.1(1.25-13.4)*
Type of surgical intervention	Repair	25	33	2.2(0.908-5.328)	1
	Hysterectomy	20	12		1.86(0.62-5.6)
Duration of procedure	<60 minutes	23	29	1.73(0.248-1.343)	1
	≥ 60 minutes	22	16		1.32(0.46-3.78)

*Significant at p<0.05

After analyzed by multiple logistic regression, blood pressure was found to have significant association with maternal outcomes of uterine rupture.

Women who presented with un-recordable blood pressure have 4.1 times more likely to have a bad maternal outcome than those who presented with recordable blood pressure [AOR=4.1; 95%CI (1.25-13.4), P-value=0.02].

Table 5.8 Binary logistic regression on factors associated with fetal outcomes of uterine rupture in Wolisso St. luke Catholic Hospital.

Variable		Outcome		COR(95% CI)	AOR(95% CI)
		Alive	Dead		
Presence of previous cesarean scar	Yes	4	10	30(3.043-295.801)	22.5(1.9-266.4)*
	No	1	75		1

*Significant at p<0.05

Presence of previous cesarean scar was analyzed with multiple logistic regression and found to have significant association with fetal outcome.

Neonates born from mothers who had previous cesarean scar have 22.5 times more likely to be alive than those born from mothers who had no previous cesarean scar [AOR=22.5; 95%CI (1.91-266.36), P-value=0.013].

CHAPTER SIX

Discussion

The prevalence of uterine rupture in the present study was 1.07% or 1:94 deliveries.The prevalence in this study is lower when compared to studies conducted in Pakistan, unit-II Liaquat University Hospital(1:41) and in Ethiopia, Aira Hospital(1:27), Debre Markos Hospital(1:26) and Yirgalem General Hospital(1:19) (18,27,24,26).However it is higher than studies done in Tanzania(1:445), Saudi Arabia(1:1,048) and Netherland (1:1708) (20,14,16). This difference in prevalence may be difference in delivery service coverage, health seeking behavior of the community, accessibility of facilities, and availability of skilled personnel.

In our study 97.8% of cases were multiparas, 96.7% were rural residence, in 63.3% of women labor lasted for more than 24 hours and 53.3% were not having antenatal care follow up. This result is in good agreement with other reports that multiparity, rural residence, prolonged labor and lack of antenatal care were risk factors for uterine rupture (3, 13, 18, 20, 21, 23, 28). Increasing parity is used to be associated with increased rate of uterine rupture. Nevertheless, Yamani's study suggests that with proper antenatal care, modern obstetrics, and advanced neonatal services there is no difference in outcome between garnd multiparous women and women with low parity (29).

WHO reported on its systematic review; in developed countries rupture of the uterus is largely associated with previous cesarean scar these may be due to high caesarean section rate as compared to less and least developed countries where, 75% of cases of uterine rupture were associated with unscarred uterus (15). Our finding showed that majority (84.4 %) of uterine rupture occurred on unscarred uterus whereas 15.6% were from women who have previous cesarean scar, which is comparable with other studies (3,14,20,21). The commonest cause were obstructed labor due to cephalopelivic disproportion (42.2%), malpresentation and malposition (37.8%). This is in concurrence with reports from other developing countries (3,20).

In the present study uterine rupture occurred after hospital admission in 12(13.3%) cases, where uterine rupture after hospital admission is unacceptable. This may be due to difficulty in detecting early warning signs of uterine rupture.

The type of surgical intervention in ruptured uterus depends on the site, extent, hemodynamic status of the patient, fertility wish, as well as experience of the surgeon. In this study Repair (40% repair with bilateral tubal ligation and 24.4% repair only) was the most preferred procedure. Our Result is in agreement with other studies (21,28,20). This maybe because ruptured uterus is an obstetric emergency that require quick response to arrest bleeding and repair provides a quick means to achieve homeostasis. In the context of Ethiopian culture, a sterile woman can face long term social and economic problems**.**

The high perinatal mortality rate in this study 94.4% is in correlation with reports from Adigrat (98.1%) and Tanzania (96.3%) (25,20). On the contrary it is higher when compared with other studies done in Yemen (54.3%), Saudi Arabia (33%), and Netherland (8.7%) (3,14,16). The high perinatal mortality rate may possibly be due to majority of women came after cessation of fetal movement, delay between diagnosis and operation, presence of expertise as well as neonatal care. Previous cesarean scar had significant association with perinatal outcome. Neonates born from mothers who had previous cesarean scare are more likely to be alive than those born from mothers who had no previous cesarean scar. This may be early intervention will be done for mothers with previous scar.

Similar to other studies the commonest maternal morbidities associated with uterine rupture in this study were anemia (33.3%), wound site infection and dehiscence (22.2% and 17.8%) (3,18,23). Among anemic patient's blood were transfused for 53.3% of cases which is comparable with Ishraq's report (3). The maternal case fatality rate (4.4%) showed to be low when compared to studies done in Tanzania and Jamshoro, where the case fatality rate ranges between 12.9% to 20% (20,17), whereas comparable with 5% and 6% in Aira and Yirgalem General hospital, Ethiopia and 5.9% in unit II Liaquate university hospital, Pakistan (27,26,18). However our result is higher than other studies where there is no maternal death due to uterine rupture at all (3,14). The maternal morbidity and mortality may be due to delay in presentation of the mother, delay in diagnosing uterine rupture and appropriate management.
Blood pressure had significant association with maternal outcomes of uterine rupture.

CHAPTER SEVEN

Conclusion and Recommendation

Conclusion

The incidence of uterine rupture is high 1:94 deliveries. Multiparity, rural residence, prolonged labor and lack of antenatal care were predisposing factors. The leading cause were obstructed labor. The commonest surgical intervention was repair (with and without bilateral tubal ligation).Un-recordable blood pressure had significant association with maternal outcome. Neonates born from mothers having previous cesarean scar had significant association with neonatal outcome. The perinatal mortality rate was high. Half of the women develop post operative complications and the maternal case fatality rate was 4.4%.

Recommendation

- Enhance doctors and midwives to detect early warning signs and symptoms of uterine rupture.
- Increase health service coverage and improve quality of service.
- The clinicians need to record all the findings on medical charts of the patients.
- Patient's medical records should be kept appropriately.
- Large sample size is needed to identify significant statistical association between various risk factors and outcome of uterine rupture.

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ANNEX

Checklist

Jimma University College of Public Health and Medical Sciences Department of Emergency Surgery, Checklist for research activity on prevalence and factors associated with management outcomes of uterine rupture at St. Luke catholic hospital, Oromia Regional State, Southwest Shoa, Ethiopia

Part I: Patient's Demographic Profile

QuesNo.	Questions	Coding Category
1	Age in years	1. ≤ 18
		2. 19 – 34
		3. ≥35
2	Address	1. In Woliso town
		2. Out of Woliso town

Part II: Obstetric Profile

Ques. No.	Questions	Coding Category
3	Gravidity	1. Primigravid
		2. Multigravid
		3. Grandmultigravid
4	No. of alive children	1. None
		2. ≥ one
5	Gestational age in weeks	1. Pre-term
		2. Term
		3. Post-term
6	ANC follow up	1. Yes
		2. No
7	Presence of previous cesarean scar	1. Yes
		2. No
8	Type of previous C/S	1. Lower uterine segment
		2. Other types

Part III: Clinical Profile

Ques No.	Questions	Coding Category
9	Onset of labor	1. Spontaneous
		2. Induction
10	Duration of labor in hours	1. <24
		2. ≥24
11	Recorded diagnosis of uterine rapture	1.Yes
		2.No
12	If yes to Q11,time of rupture	1. Before admission
		2. After admission
13	Constant abdominal pain	1.Yes
		2.No
14	Vaginal bleeding	1.Yes
		2.No
15	Cessation of fetal movement	1.Yes
		2.No
16	Blood pressure	1.Recordable
		2.Unrecordable
17	FHB	1.Positive
		2.Negative
18	Abdominal tenderness	1.Yes
		2.No
19	Easily abdominally palpable fetal parts	1.Yes
		2.No
20	Uterine contractions	1.Yes
		2.No
21	Cephalo-pelvic disproportion	1.Yes
		2.No

22	Malpresentation /Malposition	1.Yes
		2.No
23	Previous uterine scar	1.Yes
		2.No
24	Induction/augmentation	1.Yes
		2.No
25	Obstetric maneuvers	1.Yes
		2.No

Part IV Management Profile of Uterine rupture (Only for those mothers with a recorded diagnosis of uterine rupture)

Ques No.	Questions	Coding Category
26	Site of uterine rupture	1. Lower uterine segement
		2. Upper segement (fundal)
		3. Lateral (Right or left)
		4.Posterior
		5.Combined sites
27	Associated organ damage duringrupture	1. Yes
		2. No
28	Type of surgical intervention	1.Repair of all injured organs
		2.Repair with bilateral tubal ligation
		3.Subtotal abdominal hysterectomy
		4.Total abdominal hysterectomy
29	Organ damage during operation	1. Bladder
		2. Ureter
		3. Bowel
		4. Vagina
		5.None
30	Duration of the procedure	1. < 60 minutes
		2. ≥60 minutes

31	Post-operative complication	1. Yes
		2. No
32	Post-operative complication(s)	
33	Length of hospital stay	1. Day of admission to 7 days
		2.8-14 days
		3. >=15 days
34	Maternal outcome	1.Good
		2.Bad
35	Neonatal outcome	1. Alive
		2. Dead

Name of data collector _____

Signature _____

Date _____

Declaration

I, the undersigned, declare that this thesis is my original work, has not been presented for a degree in this or any other university and that all sources of materials used for the thesis have been fully acknowledged.

Name of student: Tigist Getahun Worku

Signature: _____

Name of institution: Jimma University

The thesis has been submitted for examination with my approval as university advisor.

1. Mr. Desta Workneh (MSC, BSC in Maternal and Reproductive Health)
   Signature _____
   Date _____

2. Mr. Cherenet Hailu (MPH)
   Signature _____
   Date _____