MANAGEMENT OUTCOME OF UTERINE RUPTURES IN ATTAT HOSPITAL SOUTH NATION, NATIONALITIES AND PEOPLE REGION, ETHIOPIA.

BY:
TESHOME DANDESA (BSc)

A Research thesis to be submitted to the research and graduate studies coordinating office, college of health sciences, Jimma University, for the partial fulfillment of Degree of Master in Integrated Emergency Obstetrics/Gynecology and surgery (IEOS).

December 2015

Jimma, Ethiopia

JIMMA UNIVERSITY COLLEGE OF HEALTH SCIENCES, POSTGRADUATE DEPARTMENT OF INTEGRATED EMERGENCY OBSTETRICS/GYNECOLOGY AND SURGERY

MANAGEMENT OUTCOME OF UTERINE RUPTURES IN ATTAT HOSPITAL SOUTH NATION, NATIONALITIES AND PEOPLE, ETHIOPIA.

By:

TESHOME DANDESA (BSc)

E-mail: tdandesa@gmail.com

Phone no: 091 217 99 99

Advisors: Dr. Dejene Asefa (MD, Assistant Professor of Obst. Gyn)

Dr Fessahaye Alemseged (MD, Associate Professor of Epid.)

December 2015

Jimma, Ethiopia

ABSTRACT

Background: - Even though uterine rupture is infrequent event it is a common cause of maternal and prenatal mortality and morbidity. It can either occur in women with unscarred uterus or a uterus with a surgical scar from previous surgery. The occurrence of ruptured uterus varies in different parts of the world. In the developed world the frequency has dropped significantly whereas it is still a major public health problem in developing countries in general and Africa in particularly.

Objective: -To determine management outcome of uterine rupture in Attat hospital, South Nation, Nationalities and People Region, Ethiopia.

Method:-A retrospective study was done in Attat Hospital, from January 1, 2012, to December 30, 2014 to determine management outcome of uterine rupture. The data were collected from patients' medical record charts and operation registration book of patients admitted to Gyn obst ward with the diagnosis of uterine rupture during study period from February 1-30, 2015. A total of 65 patient's cards were reviewed and 60 of them fulfill inclusion criteria. SPSS version 20.0 was used for data processing and analysis. Descriptive statistic and binary logistic regression were used for analyses.

RESULT: - Out of the total 5370 deliveries conducted in Attat Hospital during the study period 60(1.1%) were cases of uterine rupture. Twenty two (36.7%) of the cases were in the age group of 30-34 years, 50(83.3%) of patients were married, 40(66.7%) of cases were Para I-IV and 35(58.3%) of cases were stayed in labor for more than 24hours. The major causes of rupture were cephalopelvic disproportion 30(50%) followed by malpresentation and malposition 14(23.3%) of the cases. There were 7(11.7%) maternal death and 53(88.3%) of stillbirth among patients with uterine rupture. Out of 60 with uterine rupture 16(26.7%) of patients stayed in hospital before operation for <1 hour and 44(73.3%) patients stayed for >=1 hour in hospital before operation. Twenty seven (45%) of patients were with hemoglobin above or equal to 11mg/dl, 16(26.7%) of patient with hemoglobin below 7g/dl, 11(18.3%) of patients were with hemoglobin in the range of 7g/dl-9.99g/dl, and 6(10%) of patients were in the range of 10-10.99g/dl hemoglobin before operation.

CONCLUSSIONS AND RECCOMENDATIONS: - The maternal morbidity, mortality and perinatal mortality associated with uterine rupture were very high. Among patients with uterine rupture, 5(8.3%) of patients had previous history of Cesearean section. This higher morbidity and mortality were calls for an integrated effort to prevent its causes.

KEYWORDS: - Uterine rupture, Management outcome, Attat Hospital

ACKNOWLEDGMENT

First and for most my deepest appreciation goes to the almighty God for his divine protection and guidance given me to complete this research paper.

I am very much grateful to my advisors Dr. Dejene Asefa and Dr Fessahaye Alemseged (Epid.) for their unreserved guidance and constructive suggestions and comments during the research process.

I am also grateful to Jimma University College of health sciences post graduate study program coordinator office for giving me the chance of conducting and preparing this research paper.

My heartfelt thank also goes to Attat hospital staffs for their support by giving me important documents necessary for the data collection.

Lastly, I thank my wife Sara Taye and my friends who have given their important inputs during the preparation of this thesis paper.

LIST OF ACRONYMS

AH	Attat Hospital
AOR	Adjusted Odd Ratio
ANC	Antenatal Care
BTL	Bilateral tubal ligation
CI	Confidence Interval
COR	Crude Odd Ratio
CS	Cesearean Section
E and C	Evacuation and Curettage
ETB	Ethiopian Birr
Etc	Extra
GTD	Gestational trophoblastic diseases
IEOS	Integrated Emergency Obstetric and surgery
MRN	Medical Record Number
NGT	Naso gastric tube
PPH	Postpartum Hemorrhage
SPSS	Statistical package for social sciences
STAH	Subtotal Abdominal Hysterectomy
TAH	Total Abdominal Hysterectomy
TOL	Trial of Labor
WHO	World Health Organization

Table of Contents

LIST OF TABLES

LIST OF FIGURES

1. INTRODUCTION

1.1. Background

Ethiopia is one of the less developed 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, 400-700/100,000 live births and the perinatal mortality is also high (1). One of the major causes of maternal and perinatal mortalities is rupture of the uterus (2-4). The occurrence of ruptured uterus varies in different parts of the world. In the developed world the frequency has dropped significantly. Nevertheless, it is still a major public health problem in developing countries in general and Africa in particular (5-8).

Over the past decade, the maternal mortality ratio in Ethiopia has remained static at 676 per 100 000 live births. However, currently maternal mortality ratio in Ethiopia is 353 per 100 000 live births (9).

A hospital-based study in Ethiopia reported that uterine rupture is a common obstetric cause of maternal and fetal mortalities. The same study reported that uterine rupture occurred one in every 38 deliveries. This sudden catastrophic event has different causes. Unlike in the developed world where oxytocin stimulation and scarred uterus are the major causes in less developed countries fetopelvic disproportion causing obstructed labor is the major cause of uterine rupture (8).

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. Contributing factors are also extremes of maternal age (too young or too old) and too many births within short intervals which cause fertility rate of 7.4 births per woman (10). About 20 percent of the population in developing countries is women of reproductive age. These women face one of the catastrophic risks of pregnancy “uterine rupture”. Studies conducted in the developing world give strong evidence that uterine rupture is a major health problem in these countries with the rate being high in rural areas (11, 12).

1.2 Statement of problem

Uterine rupture is a serious obstetric complication, with high morbidity and mortality, particularly in less and least developed countries. Among many parts of Africa, Ethiopia is one of the countries where uterine rupture is encountered as a major obstetric problem. It is a common obstetric emergency and a significant health problem in Ethiopia (1).

Ethiopia is one of the countries with the highest maternal mortality which is estimated at 353 deaths per 100,000 live births from World Health Organization (WHO) 2015 report. Majority of maternal deaths take place during childbirth and the immediate postpartum period. The major causes of maternal mortality and suffering are due to direct obstetric complications (9).

Rupture of the pregnant uterus is a potential obstetrics catastrophic & a major cause of maternal death. The diagnosis and treatment modalities reflect a lot of local factors and peculiarities (facilities available and the propensities of the managing teams) (3).

The knowledge of management outcome and causes of uterine rupture in a country as well as in different parts of the country has significant value in fast diagnosis and on time surgical intervention which result in good outcome of the patient (4).

Different modes of management are practiced, namely repair of the uterine tear, total abdominal hysterectomy (TAH) and subtotal abdominal hysterectomy. The preference of management and outcome varies in different centers (3)

No study done regarding the mgt outcome of uterine rupture in SNNPR, Gurage zone, particularly in Attat Hospital. Thus, this study will be intended to give some information and generate base line information about management outcome of uterine rupture in AH.

2. LITERATURE REVIEW

2.1. Management outcome of uterine rupture

Maternal mortality is a major public health problem, particularly in sub-Saharan Africa, where half (50.4%) of all maternal deaths worldwide occur. One objective of the Millennium Development Goals is to reduce maternal mortality by 75% between 1990 and 2015 GC. In 2005, the maternal mortality ratio in sub-Saharan Africa, estimated at 900 maternal deaths per 100 000 live births, was by far the highest in the world (1).

For developed countries, the data available indicate that the prevalence of uterine rupture for women with previous caesarean section is in the region of 1%, whereas for women without previous caesarean section, based on one large report, it is extremely rare (<1 per 10,000). Overall, the rates are below 1 per 1000. Efforts to reduce morbidity and mortality from uterine rupture should be focused on reducing primary caesarean section rates and optimizing care for women with previous caesarean section (2). 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 and Ethiopia and indicated that about 75% of cases of uterine rupture were associated with unscarred uterus (1, 3).

Maternal mortality ranged between 1% and 13%, and perinatal mortality between 74% and 92%. Reduction of the prevalence of rupture of unscarred uterus requires the following: reduction of unwanted pregnancies, particularly for women of high parity; accessibility of obstetric services including caesarean section for obstructed labor; where conventional caesarean section facilities are not accessible, innovative solutions such as symphysiotomy or caesarean section with local analgesia should be considered; and guidelines to ensure that misoprostol for labor induction is used in safe dosages (4,5).

According to Study done in USA (From January 1, 1983, through December 31, 1994); There were 13 uterine ruptures in women without previous cesarean deliveries and Three of them are due to motor accident and Ten cases during labor . The incidence of intra partum rupture of an unscarred uterus was 1 in 16,849 deliveries. In contrast, in the 8 women with no previous uterine surgery, one woman died, one woman developed renal failure, and there were 3 fetal losses. Four women needed total abdominal hysterectomy, and 4 women needed repair. Two women needed internal iliac ligation in addition to the hysterectomy (10).

In Yirgalem General Hospital, Yirgalem, SNNPR, Ethiopia, one study shows from a total of 92 cases were identified. 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. (8)

Study conducted in Adigrat Hospital shows a total of 54 cases of ruptured uterus and 5,980 hospital deliveries were recorded. Causes of rupture were: cephalopelvic disproportion (53.7%), malpresentation and malposition (25.9%), instrumental (3.7%), pitocin induced (3.7%), uterine scar (11.2%) and placenta percreta (1.8%). 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. Presenting features include: acute abdominal pain in 48 (88.9%), tachycardia in 38 (70.4%), hypotension in 26 (48.1%), coma in 2 (3.7%), vaginal bleeding in 22 (40.7%), palpable fetal parts in 27 (50%), abdominal tenderness in 45(83.3%), sepsis in 10 (18.5%) and shock in 22(40.7%) (6).

The mean hemoglobin level at admission was 9.5 gm/dl. Sixty eight percent of cases had a hemoglobin level of 10 g/dl or below (6).

The site of rupture of the uterus with its extension to the cervix (25.7 %) and rupture of the bladder (8.6 %) is in some cases a finding suggesting malpresentation, obstructed labor and late

coming to hospital. Fetal outcome was death in 54.3 % and survival in 45.7 % with different degree of fetal compromise. In 45.7 % of the cases fetuses were in the abdomen and 37.1 % had the placenta in abdominal cavity also (13).

Maternal outcome in study done in Yemen showed no mortality. Almost half of patients (45.7 %) had a repair of the rupture with tubal ligation, 14.3 % had total hysterectomy, and 5.7 % had subtotal hysterectomy. Therefore only 31.4 % of patients could may be reserve their fertility. Loss of fertility in Yemen is a catastrophic event; the infertile woman is rarely accepted and usually disgraced. Moreover, there is the possibility that her husband may divorce her or marry another wife. (13)

Study conducted in Gimbi Adventist Hospital, Gimbi, West Wollega, Ethiopia, shows there were 10, 270 deliveries over the 10–year period. Uterine rupture occurred in 386 (3.7%) women and was surgically treated. A total of 19 women (4.8%) died as a result of their uterine rupture. Only eight women ruptured their uterus in their first pregnancy, 15 had had a previous caesarean section, and eight had a previous scar rupture. Three hundred and eighty-two (98%) women had not received any antenatal care during the pregnancy. Two hundred and forty-two women (63%) reported that their labor had lasted for more than 24 hours. 17 patients who waited for surgery for >=1hr were die and only 2 were die from patients waited for < 1hr. Only five of the 386 women (1.2%) underwent hysterectomy, the remainder being treated by primary repair (7).

Twenty-four women (6%) had previous uterine surgery, and only one of these died. None of the eight women who received antenatal care had had previous uterine surgery. When the uterus ruptures, contractions cease, making it possible to estimate the time from uterine rupture to presentation for treatment: of the 111 women who arrived at the hospital within 12 hours of the cessation of labor, one (0.9%) died; 14 of 239 (5.9%) women who arrived between 12 and 24 hours of the cessation of labor died; and four of the 36 women (11.1%) in whom there was a delay of more than 24 hours died. (14)

Postoperatively, out of the total patients cured 8 (16.7%) had wound infection, 6 (12.5%) vesico-vaginal fistula, 5 (10.4%) urinary tract infection and 2 (4.2%) pneumonia. There were 6 maternal deaths (11.1%) and 53 fetal deaths (98.1%). During the same study period, there were 25 total

direct obstetrics maternal deaths in the hospital. Maternal death due to uterine rupture was therefore responsible for 24% of obstetric maternal deaths. (15).

According to Study done in Northern Nigeria duration of hospital stay ranged from 5-24 days with mean stay of 7.5 days; 65 % of the patients were discharged on 7 postoperative days (3).

2.2. Intraoperative procedures

There were no intraoperative deaths and the deaths that occurred were in the ensuing 10 days, the result of sepsis or untreated anemia. There were five complications in the survivors requiring a further laparotomy: four pelvic abscesses and one urinoma. Although only ten nulliparous women ruptured their uterus, all reached hospital within 12 hours of the cessation of labor: eight had a labor lasting more than 24 hours and two (25%) died. It is not known whether any of these nulliparous women received any intervention such as uterine massage prior to admission. (17)

Twenty cases (37%) had total abdominal hysterectomy. Repair with or without bilateral tubal ligation (7 with, 14 without) was done in 21 (38.9%) cases. Of the cases 13 (24.1%) had subtotal abdominal hysterectomy. (6)

Study conducted in Debremarkos Hospital shows from total deliveries 1830 frequency of uterine rupture was 3.8% or 1 in 26 deliveries. Mean parity was 3.6% and grand multiparas accounted for most 34.2%. Intraoperatively 62% were completed uterine rupture while 8% were incomplete. Hysterectomy was done for 57% and 13% were repaired. (18)

2.3 Significance of the Study

Uterine rupture is one of the obstetrical emergency that cause major mortality & morbidity if not managed early and appropriately. In Ethiopia, where early diagnosis and intervention is not equally performed at all setups due to lack of human resources, diagnostic facilities, inadequate transportation facilities, low awareness of community to seek health care early, which might contribute to difficulty of managements and increased risk of postoperative complications and poor out comes; it is important to know the management outcome of uterine rupture. This will help to develop practice on how to approach patients presenting with uterine rupture and prevention of complications.

This study will have advantage by providing baseline information about the management outcome of uterine rupture in the study area. It might have an advantage for health professionals and other concerned body in that it will add useful information about uterine rupture.

The result of this study will also add clinical information that will also helps as input for those who want to undertake researches on the management outcome of uterine rupture in study area.

2.4. Conceptual framework

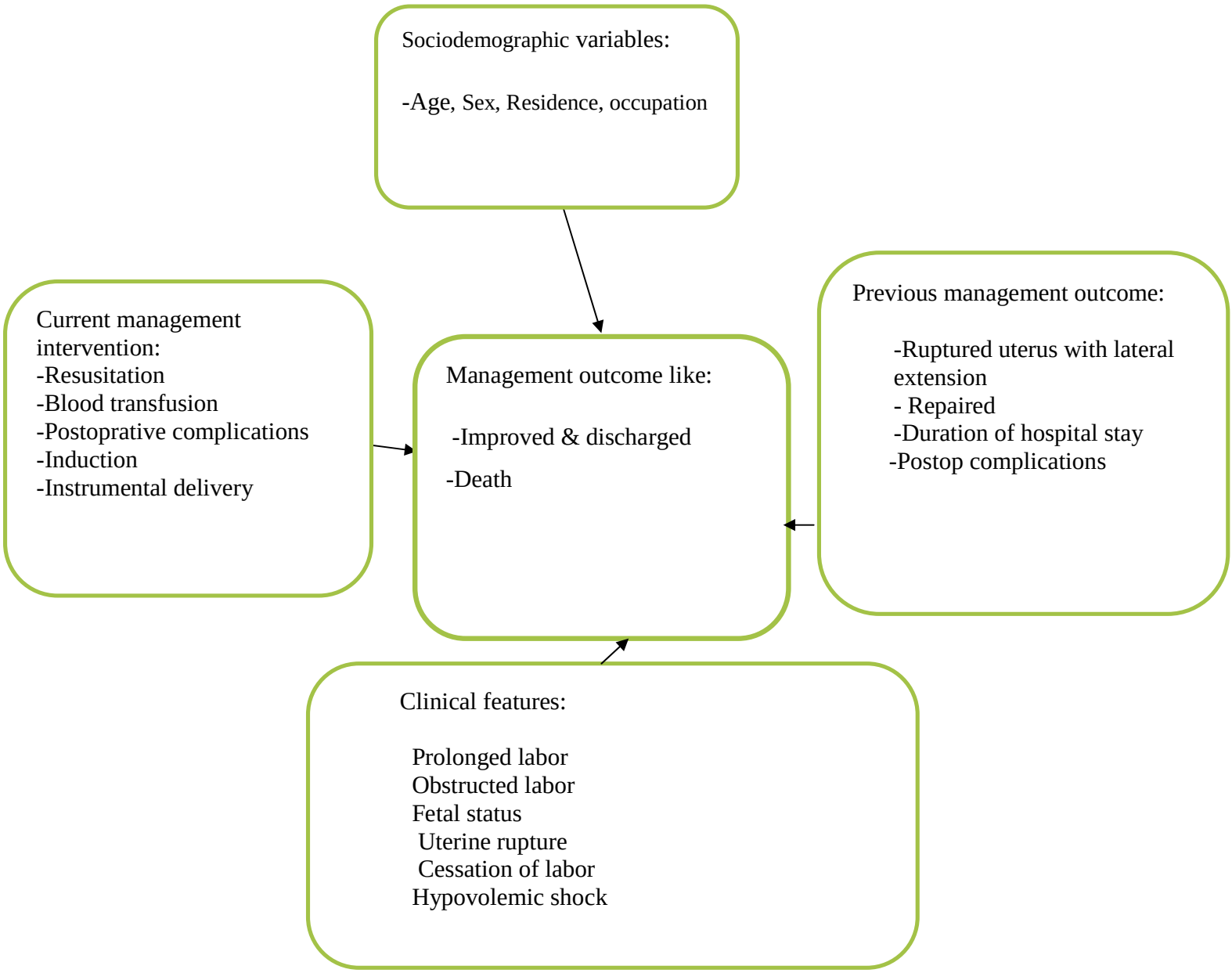

Figure 1 Adapted conceptual famework on management outcome of uterine rupture

3. OBJECTIVES

3.1 General objective

- To determine management outcome of uterine rupture and associated factors in Attat Hospital from February 1-30.

3.2 Specific objective

- To determine management outcome of uterine rupture in Attat Hospital.
- To assess type of intraoperative procedure done for ruptured uterus mother in Attat Hospital.
- To determine the factors associated with management outcome of uterine rupture.

4. METHODS & MATERIALS

4.1 Study area and period

Attat Hospital is public hospital found in the Southwest of Ethiopia. It is located about 187 kilometers, South West of Addis Ababa along Jimma Road Southern Region of Ethiopia, Gurage Zone, and Cheha woreda. The service has been operative since 1969. The Service is owned by the Ethiopian Catholic Church and is managed by Medical Mission Sisters, an International Religious Congregation.

Gurage Zone is a densely populated, rural area with approximately 1,537,598 inhabitants.

Attat hospital is serves for about 142,253 populations in catchments area. The hospital gives service with a total of 74 staffs. Out of these one is Gynecologist and 73 are other health professional including General surgeon, General Practioner, Health officer, Nurses and 8 Midwives. It has 65 beds out of this Gynecology ward consists of 18 beds and Obstetrics has 25 beds. It has one operation theatre which consist two rooms and tables.

AH was one of Abba Francois' long time dreams which materialized during his life time. In the early days basic nursing services were provided by the nuns at Saint Antonions' Sisters Mission indibir. Today the community Health activities are many and varied, covering a whole range of activities and services over seen by the Integrated Health and Development program of AH.

The data was collected for one month starting from February 1-30, 2014, AH.

4.2 Study design

Hospital based retrospective cross sectional study design was conducted from January 1, 2012-December 30, 2014.

4.3 Population

4.3.1 Source population

The source populations were all patients admitted to gynecology and obstetrics ward of Attat Hospital from January 2012 to December 2014.

4.3.2 Study population

All Patient cards with diagnosis of uterine rupture at Attat hospital from January 1,2012 to December 30, 2014.

4.4 Inclusion and Exclusion criteria

Inclusion criteria

- ❖ Patients who were diagnosed as uterine rupture and managed with operation.

Exclusion Criteria

- o Patients whose charts were lost
- o Patients with incomplete information

4.5 Sample size determination

All cards of patients that admitted to Obstetrics and Gynecologic ward of Attat Hospital with the diagnosis of uterine rupture and treated from January 1, 2012 to December 30, 2014 were included without sampling. Therefore a total of 65 patients were admitted for uterine rupture during the study period among which 60 fulfills the inclusion criteria and included in the study.

4.6 Study variables

4.6.1 Dependent variables

Uterine rupture management outcome

4.6.2 Independent variables:

Age, Residence, Occupation
Site of uterus ruptured
Causes of uterine rupture
Previous histroy of uterine rupture
Methods of patient management
Intraoperative finding
Intraoperative Procedure done

Duration of hospital stay
Duration of labor at first admission
Fetal outcome
Status of mother at admission(labor pain, shocked,coma ...)
Duration of cessation of labor

4.7 Data collection methods

4.7.1. Data Collection instrument

The check list were developed by English language for collection of important information such as age, sex, admission diagnosis, intraoperative finding, intraoperative procedure done, duration of presentation, causes of uterine rupture, postoperative complications and management outcome of patients.

4.7.1. Data collection techniques

Patient's card numbers for those mothers who have been admitted to obstetric and gynecologic wards of Attat hospital with the diagnosis of uterine rupture and treated from January 1,2012-December 30,2014 were initially identified from admission log-books of obstetric and gynecologic ward. Then cards of the patients with uterine rupture were identified and separated from medical record room and important information were reviewed by selected data collectors using checklist already prepared to collect important information about patients admitted with the diagnosis of uterine rupture.

4.8 Data processing and analysis

Data was coded, entered and cleaned, using SPSS version 20.0 to be analyzed by using descriptive statistics like Percentages, mean and standard for elementary data analysis.

Some variables were recorded into different variables and then logistic regression was conducted to determine factor for the different outcomes of the patients. The result was explained using frequencies, percentages and cross tabulations for selected variables. Bivariate and Multivariate analysis were done for variables. P-value <0.25 in bivariate was exported to multivariate for final model. In order to test for the associations of the outcome variable with the independent variables binary logistic regression was applied accordingly. P-value, confidence interval and odds ratio were computed and interpreted. P-value of less than or equal to 0.05 was considered

as statistical significance. Results were summarized and presented by tables, charts, graphs and in narration form.

4.9 Data quality management

Pre- test

Before the actual data collection, the questionnaire was tested on 5% of the total study population which was before the actual study period. Then possible modification was made on the check lists using the findings of the pre-test.

For data collection two clinical nurses were recruited outside of Attat hospital staffs. The Principal investigator gave training for data collectors on how to fill the prepared checklist, the importance of data quality and the relevance of the study. Two 1st degree holder health officers supervised the daily activity, consistency and completeness of the checklist and gave appropriate support during the data collection process. The Principal Investigator checked the daily activities of data collectors and supervisor.

Before data collection: The prepared checklists in English was assessed and commented by research advisors. The facilitators and Supervisor were trained for two days.

During data collection: Regular daily supervision was done for checking the consistency and completeness of the filled out checklists by the principal investigator. The completed checklists were checked for their completeness and consistency at every step of data collection.

After data collection: Before starting data analysis completeness was rechecked again.

4.10 Operational definitions

Uterine rupture - Full thickness separation of the uterine wall and the overlying serosa.

Intraoperative procedure: The procedure that can be done after laparatomy was done which can be repair , TAH or STAH

Intraoperative finding: The finding after abdomen is opened which can be transverse anterior lower segment rupture, left vertical or right vertical rupture.

Outcome of patient –is condition of the patient at discharge from hospital after hospital stays e.g. improved and discharged or died.

4.11 Ethical consideration

The ethical approval and clearance was obtained from Jimma University Ethical Clearance Committee and cooperation letter was written to the hospital from department of Integrated Emergency Obstetrics/Gynecology and surgery and permission for conducting the study was assured first from CEO. The card room staffs were informed and got permission from them.

4.12. Dissemination of results

The result of the study will be presented to Jimma university community as part of Master's in IEOS thesis defense; and it will be disseminated to Jimma University College health sciences, department of Integrated Emergency Obstetrics/Gynecology and surgery. The result of the study will be disseminated to the study site and other concerned bodies.

5. RESULTS

Of the total of 5370 deliveries, the numbers of cases of uterine rupture were 60 thus making the overall incidence of uterine rupture during the study period to be 1.1% or 11/1000 deliveries.

5.1. Socio demographic characteristics

The age of majority of cases of uterine rupture 22(36.7%) were in the age group of 30-34 years followed by the age group of 25-29 years 15(25%), age group of ≥35 years 14(23.3%), age group of 20-24 years 5(8.3%) and age group of <20 years 4(6.7%). The age of patients presented with uterine rupture ranged from 17-40 years (mean 29.43 year and SD of 5.62). The majority of patients 50(83.3%) were married, 5(8.3%) were widowed, 3(5%) were single and 2(3.3%) were divorced. The majority of cases 12(20%) were from Enemor woreda followed by 9(15%) cases from Ezza woreda and 9(15%) from Cheha woreda. The dominant occupation was house wife 47 (78.3%) followed by farmer 6(10%).

Table 1 Socio-demographic characteristic of patient with uterine rupture in AH from January 2012-December 2014.

Variables		**Frequency**	**%**
Age	<20	4	6.7
	20-24	5	8.3
	25-29	15	25
	30-34	22	36.7
	≥35	14	23.3
	Total	**60**	**100**
Marital Status	Married	50	83.3
	Single	3	5
	Divorced	2	3.3
	Widowed	5	8.3
	Total	**60**	**100**
Residence	Geta	8	13.3
	Moher	6	10
	Ezza	9	15
	Enemor	12	20
	Gummer	8	13.3
	Cheha	9	15
	Wolkite	3	5
	Gibe	3	5
	Others	2	3.3
	Total	**60**	**100**
Occupation	Farmer	6	10
	Merchant	4	6.7
	House wife	47	78.3
	Student	1	1.7
	Governmental employee	2	3.3
	Total	**60**	**100**

5.2 Obstetrics profile

Among 60 patients with uterine rupture 16(26.7%) were Grand multipara, 40 (66.7%) were Para I-IV and 4(6.7%) were nulliparous. The mean parity was 3.5. Among 60 patients with uterine rupture 57(95%) were multigravida and 3(5%) of them were primigravida. Gestational ages during admission 51(85%) patients were term, 3(5%) were post term and 6(10%) were preterm pregnancy from information recorded on the chart using LNMP, fundal height and some have early ultrasound. From a total of 60 patients 33(55%) had ANC follow up and 27(45%) had no ANC follow up during the index delivery. Twenty three (69.7%) of patient had ANC follow up less than four times and 10(30.3%) of patients had four or more times.

Among patient with uterine rupture, 35(58.3%) of patient were stayed in labor for more than 24hours, 21(35%) patients stayed in labor for 12-24 hours and 4(6.7%) patient stayed in labor for less than 12 hours before arrival to Attat Hospital.

The fetal presentation 50(83.3%) of patients were cephalic, 6(10%) were breech presentation and 4(6.7%) were shoulder presentation.

Out of 60 with uterine rupture 16(26.7%) of patients stayed in hospital before operation for <1 hour and 44(73.3%) patients stayed for >=1 hour in hospital before operation, some of them for resuscitation purpose and in some of the cases the rupture occurred after admission due to induction. The duration of hospital stay before operation was ranged from 30min to 8 hrs after admission with the mean and SD of 2.42 and 1.44 respectively.

Among patients with uterine rupture, 5(8.3%) of patients had previous history of Cesearean section and their indication was NRFHRP, OL, Failed instrumental delivery, Failed augmentation and induction, previous CS scar and Twin first breech 1(1.7%) (Table2).

Table 2 Obstetrics profile of uterine rupture cases at the time of index pregnancy and delivery, AH from January 2012-December 2014.

Variables/Obstetric characteristics		**Frequency**	**%**
GA during admission	Preterm	6	10
	Term	51	85
	Post term	3	5
	Total	**60**	**100**
Parity	Nulliparous	4	6.7
	I-IV	40	66.7
	>or=V	16	26.7
	Total	**60**	**100**
Gravidity	Primigravida	3	5
	Multigravida	57	95
	Total	**60**	**100**
ANC follow up	Yes	33	55
	No	27	45
	Total	**60**	**100**
Frequency of ANC	<4	23	69.7
	≥4	10	30.3
	Total	**33**	**100**
Duration of labor	<12 hrs	4	6.7
	12-24 hrs	21	35
	>24hrs	35	58.3
	Total	**60**	**100**
Fetal presentation	Cephalic	50	83.3
	Breech	6	10
	Shoulder	4	6.7
	Total	**60**	**100**
Duration of stay in AH before operation	<1hour	16	26.7
	>=1hour	44	73.3
	Total	**60**	**100**

5.3 Clinical Feature and Cause

The majority of patient 30 (50%) were presented with cessation of labor followed by vaginal bleeding 18(30%) and 11(18.3%) of patients presented with a complaint of abdominal pain and only 1(1.7%) patient presented with leakage of liquor per vagina. The commonest findings up on physical examination of these cases were; easily palpable fetal part (51.7%) followed by absent fetal heart beat 20(33.3%), shock 7(11.7%), and 2(3.3%) of patients with pooling of fluid through cervix on speculum examination. Among patients with uterine rupture 50 (83.3%) of them were diagnosed as uterine rupture at admission, 2(3.3%) as normal labor and 2(3.3%) were diagnosed as premature rupture of membranes where as 6(10%) misdiagnosed as obstructed labor.

For all of patients hemoglobin was done before operation; 27(45%) of patients were with hemoglobin above or equal to 11mg/dl, 16(26.7%) of patient with hemoglobin below 7g/dl, 11(18.3%) of patients were with hemoglobin in the range of 7g/dl-9.99g/dl, and 6(10%) of patients were in the range of 10-10.99g/dl hemoglobin before operation. The mean hemoglobin level at admission was 9.05 gm/dl.

The cause of uterine rupture among patient with uterine rupture were CPD 30(50%) followed by malpresentation and malposition 14(23.3%), previous uterine scar 5(8.3%), 3(5%) of patients associated with augmentation and induction, 2(3.3%) of patients associated with destructive delivery, 2(3.3%) of patients associated with manual removal of the placenta, 2(3.3%) of patients after instrumental delivery were and 2(3.3%) of patients associated others like trauma and postpartum curettage (Table 3).

Table 3 Clinical features, cause (associated factor) and pre-operative evaluation of patient with Uterine rupture in AH from January 2012-December 2014.

Clinical features		**Frequency**	**%**
Presenting complaint	Cessation of contraction	30	50
	Vaginal bleeding	18	30
	Abdominal pain	11	18.3
	Leakage of liquor per vagina	1	1.7
	Total	**60**	**100**
Physical findings	Easily palpable fetal part	31	51.7
	Absent fetal heart beat	20	33.3
	Shock	7	11.7
	Others	2	3.3
	Total	**60**	**100**
Causes of rupture	CPD	30	50
	Malpresentation and malposition	14	23.3
	Previous uterine scar	5	8.3
	Augmentation and Induction	3	5
	Destructive delivery	2	3.3
	Manual removal of the placenta	2	3.3
	Instrumental delivery	2	3.3
	Others	2	3.3
	Total	**60**	**100**
Preop hemoglobin level	<7g/dl	16	26.7
	7-9.99g.dl	11	18.3
	10-10.99g/dl	6	10
	>=11mg/dl	27	45
	Total	**60**	**100**

5.4 Intra and Post operative condition

All cases with uterine rupture, 60(100%) were managed by laparotomy.

Among patients with uterine rupture, the common site of rupture was transverse anterior lower segment 44(73.4%) followed by left vertical lateral rupture 11(18.3%), right vertical lateral rupture in 5(8.3%) patients and 4(9.1%) of cases with lower segment uterine rupture had associated bladder rupture. Blood was transfused for 19(31.7%) of cases (Table-4).

Table 4 Site of uterine rupture and blood transfusion of cases with uterine rupture in AH from January 2012-December 2014.

Variables		**Frequency**	**%**
Site of rupture	Transverse anterior lower segment	44	73.4
	Vertical left lateral rupture	11	18.3
	Vertical right lateral rupture	5	8.3
	Total	**60**	**100**
Blood transfusion done	Yes	19	31.7
	No	41	68.3
	Total	**60**	**100**

Among uterine rupture cases; 25(41.7%) of cases repair with BTL was done,18(30%) cases repair without BTL was done, 9(15%) cases total abdominal hysterectomy was done and for 8(13.3%) cases subtotal abdominal hysterectomy was done. (Figure 2)

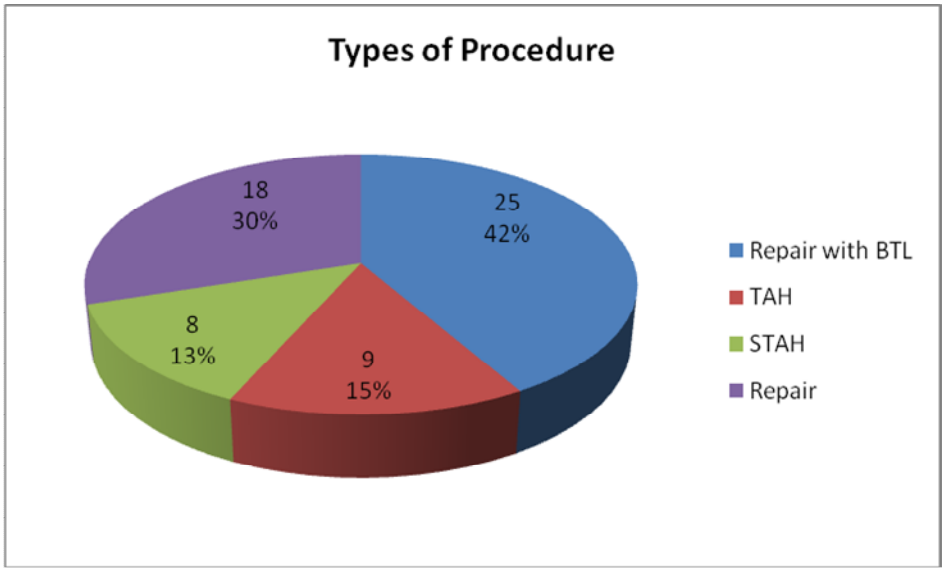

Figure 2 Procedure done for uterine rupture in AH from January 2012-December 2014.

The duration of hospital stay after operation was ranged from 4 days to 30 days. The mean and SD was respectively 8.15 and 6.95. About 42(70%) patients stayed in hospital up to one week whereas 9(15%) patients stayed 8-14 days and 9(15%) patients stayed ≥15 days.

Out of laparotomy done 12(20%) patients were developed postoperative complications. Among complication 3(25%) of cases developed wound infection, 2(16.7%) of cases developed fascial dehiscence, 3(25%) developed vescicovagina fistula, 2(16.7%) developed pelvic collection and 2(16.7%) developed other complications like septic shock and paralytic ileus. (Figure 3)

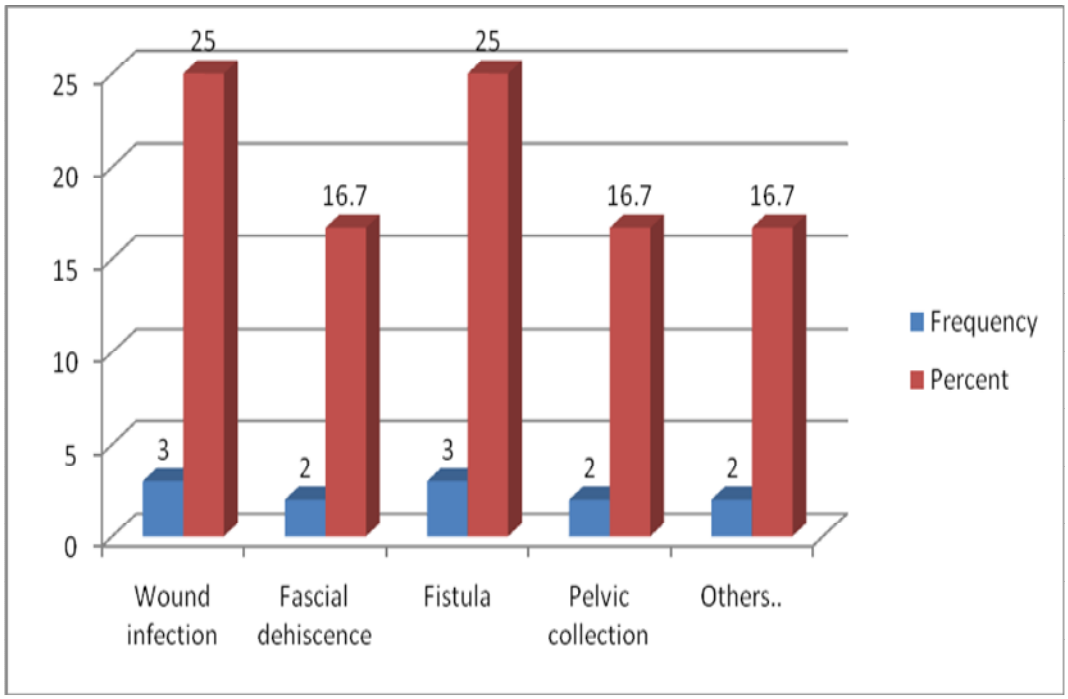

Figure 3 Post operative complication of uterine rupture in AH from January 2012-December 2014.

5.5 Maternal and Neonatal Outcome

Out of 60 patients with uterine rupture; 53(88.3%) improved and discharged and 7 patients were (11.7%) died. Among died patients 1(14.3%) was died within 1hour after operation, 3(42.9%) were died within the range of 1-6hrs and 3(42.9%) of them died after 6hrs of post operation.

There were 53(88.3%) of stillbirth and 7(11.7%) of neonate were alive, those delivered with instrument and previous uterine scar (Figure 4).

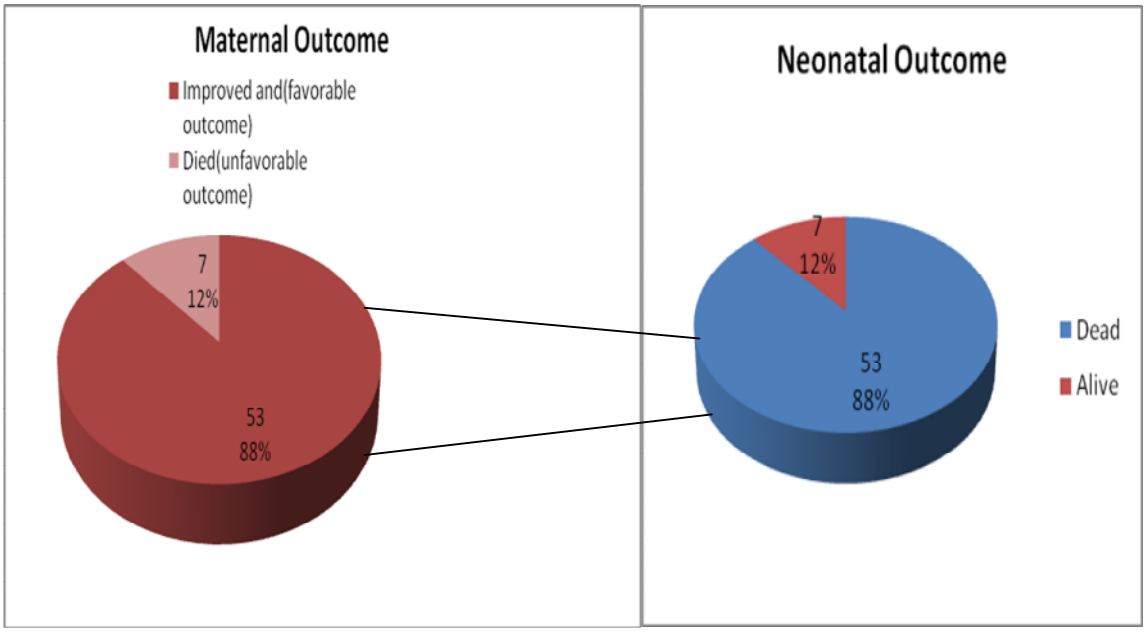

Figure 4 Maternal and Neonatal outcome of uterine rupture in AH from January 2012-December 2014.

5.6 Factors associated with maternal outcome

5.6.1 Factor associated between maternal outcome (Died and Improved discharged) with independent variables

When the association between the dependent variable (maternal death) and independent variables assessed, the results revealed that there was a significant association between maternal outcome and duration of hospital stay before operation [p-value=0.013]; 6(85.7%) of patients who died had stayed >=1 hr in the hospital before operation and 1(14.3%) of patients who died had stayed <1hr in the hospital before operation.

The study shows a significant association in maternal outcome and preoperative hemoglobin level [p-value=0.026]. Among those who had hemoglobin <7g/dl of patients 6(85.7%) were died, when compared to those patients who had hemoglobin >=7g/dl only 1(14.3%) was died.

There were no association between maternal death and other variables like parity, gestational age, residence, duration of labor (p-value>0.05).

Table 5 Crude and Adjusted associations for selected variables and uterine rupture in Attat Hospital from January 1, 2012 –December 30, 2014, SNNP region, Ethiopia

Variables	Management Outcome		COR of 95%CI	P Value	AOR of 95% CI	P-Value
Preoperative duration in AH	Improved	Died				
>=1hr			2.31(1.23-4.32)	0.009	2.56(1.21-5.40)	0.013
<1hr	15	1	1		1	
Postoperative Complication						
Yes	8	4	7.5(1.40-40.05)	0.018	0.38(0.042-3.45)	0.390
No	45	3	1		1	
Preoperative Hemoglobin						
<7g/dl	10	6	25.80(2.78-238.98)	0.004	40.56(1.55-1059.87)	0.026
>=7g/dl	43	1	1		1	

1 is reference

The above table (table 5) shows; Multivariable analysis revealed that women who stayed >= 1hr in hospital before operation were 2.56 times as likely to die from their uterine rupture as women who stayed < 1hr in hospital before operation (AOR=2.56, 95%CI 1.21-5.40 &p value 0.013) and patients who had preoperative hemoglobin <7g/dl are 40.56 times as likely to die as patients who had preoperative hemoglobin >=7g/dl (AOR=40.56, 95%CI, 1.55-1059.87 & p value 0.026).

6. DISCUSSIONS

Uterine rupture still remains one of the serious obstetrics complication and catastrophic condition to maternal and perinatal. It is commonly the result of neglected labor and weakness of uterine wall as a result of uterine scar (3). This study was under taken to analyze maternal mortality, perinatal mortality and associated factors of uterine rupture.

The mean age was 29.43 and mean parity was 3.5. It was similar trends with study done in Yirgalem Hospital and Debre Markos Hospital (8, 18).

Majority 35(58.3%) of patients were stayed in labor for more than 24hours before arrived to AH, similar trends with study done in Gimbi (7). The explanation for this delay may be lack of awareness, financial problems and lower availability of health facility nearby.

There was significant association between duration of hospital stay before operation and maternal outcome; patients stayed for >=1hour before operation were more likely to die than patients stayed for less than an hour before operation similar to the result of study done in Gimbi Hospital (7). There was also significant association between preoperative hemoglobin and maternal outcome; patients who had preoperative hemoglobin <7g/dl were more likely to die than patients who had preoperative hemoglobin >=7g/dl, similar trends with study done in Adigrat Hospital (6).

In developed country the prevalence of uterine ruptures was rare less than 1/10,000 deliveries (1, 6). In this study the incidence of rupture were 1.1% or 11/1000 deliveries. The primary reasons for these higher incidences were probably due to the fact that majority of patients were referred from other health institution and due to poor ANC follow up in the area. When compared with other study in the line slightly higher (7, 10), but it was less than other study done in Africa (6, 8, and 18).

The common cause of uterine rupture in present study were CPD in 30(50%) of patients and majority of patient with uterine rupture were stayed in labor for more than 24 hours. This can be explained by majority of patients came to hospital delayed in moribund condition and after complication happened. This explanation was in contrast with the study reported in (11, 12**)** that

majority of rupture uterus was caused by trial of labor with scar uterus by unskilled birth attendants and injudicious uses of pitocin.

The second common cause of rupture in present study; 14(23.3%) malpresentation and malposition, 5(8.3%) associated with previous uterine scar, 3(5%) associated with augmentation and Induction, 2(3.3%) associated with Instrumental delivery, 2(3.3%) associated with destructive deliveries and 2(3.3%) associated with morbidly adherent placenta. The incidence of rupture associated with malpresentation and malposition 14(23.3%) and previous uterine scar 5(8.3%) was similar, when compared with the study report in study done in Adigrat and Sana'a city Yemen (6, 13).

The common clinical presentation in my study was cessation of contraction 30(50%), which was nearly similar reported result in (15) followed by vaginal bleeding 18(30%) which was in contrast with other studies report (6) acute abdominal pain was common clinical presentation with figure 48(88.9%). In present study 13.3% of rupture cases were missed during admission and diagnosis was made after admission and manual uterine exploration before laparotomy and 2(3.3%) of rupture cases were occurred after admission.

This shows that clinical presentation can be vague and diagnosis depends on high degree of suspicion and awareness. One must constantly be considering the total clinical picture, and absence of vaginal bleeding should not make to consider less likely the diagnosis of ruptured uterus. The 3.3% of rupture cases indicate poor labor follow after admission. The uterus should be explored manually after delivery in cases with a risk of uterine rupture such as uterine surgeries when the endometrial cavity was entered or difficult instrumental deliveries.

The common site of rupture in present study were anterior wall rupture 66.7%, which was in similar trend, but slightly higher with study report in (6) with the figure of 58.5%, but in contrast with study report in (13) the common site of rupture were rupture with extension to the cervix 25.7%. Four(6.7%) of rupture was associated with bladder rupture and repair was done, similar with study report in (8) but lower when compared with study report in (6) 18.5% of associated bladder injury. This difference can be explained by majority of patients may had prolonged labor than in my study so in presence of prolonged labor more likely bladder trauma due to obstruction and the uterine tear extends to the bladder.

In this study 25(41.7%) cases were treated with repair with BTL, 18(30%) cases treated with repair without BTL, 9(15%) cases treated with total abdominal hysterectomy and 8(13.3%) cases were treated with subtotal abdominal hysterectomy almost similar with study reported in (3) with figure of 45.7% repair with BTL, 14.3 % had total hysterectomy, and 5.7 % had subtotal hysterectomy. But when compared with other study report (6) there was difference in option of surgical management with the figure of; 37% total abdominal hysterectomy, 24.2% subtotal abdominal hysterectomy, 25.9% repair without BTL, 13% repair with BTL. This difference can be explained by the type of surgical intervention of uterine rupture depended on various factors: When the patient was in hypovolemic or septic shock, there was clean lower uterine segment rupture simulating lower uterine segment caesarean section and inexperienced surgeon repair or sub-total hysterectomy was preferred in order to shorten time of surgery and anesthesia related complication.

The availability of blood for transfusion and the wish for the future child bearing capability were also important factors to determine the decision.
Total abdominal hysterectomy was preferred in the hands of experienced surgeon, relatively reassuring maternal condition and when adequate resuscitative measures were taken. Most women lost their childbearing capability because of surgical intervention. In the context of Ethiopian culture, a sterile woman can face long-term social and economic problems.

Other studies (12, 18) have also reported different modes of management depending on the above factors.
Postoperative wound infections, fascial dehiscence and Vesicovaginal fistula were common postoperative complication in this study which was also the finding (6) and hypovolemic shock from blood loss associated with maternal death.

According to this study duration of hospital stay after operation ranged from 4-30 days with mean of 8.15 days; 70% of the patients were discharged on <=7 postoperative days almost similar with study done in Northern Nigeria duration of hospital stay ranged from 5-24 days with mean stay of 7.5 days; 65 % of the patients were discharged on 7 postoperative days (3).

The fetal death in this study was 88.3% which was similar result reported (4, 5), but higher than result reported in (13) with the figure 54.3%. This can be explained by the presence of good quality intra-partum follow up was the determining factor for perinatal outcome.

The Maternal Mortality in this study were 7(11.7 % which was similar result reported in (6) with similar possible causes of death were hypovolemic shock and sepsis. But, this result higher when compared with other study result showed no mortality (7).

7. STRENGTH AND LIMITATION OF THE STUDY

7.1. Strength of Study:

- Inter personal variation was avoided since all data was collected by the same individual.
- No selection biases as all cases of uterine rupture were included.

7.2. Limitation of Study:

- Important outcome indicators were not included in the study because there was incomplete documentation and inappropriate chart keeping in Attat Hospital.
- As this was retrospective, associated psychological and other long term postoperative complications which are associated with the surgery was not included.
- Difficulty in interpreting information found in patient's cards due to some handwriting can't be read well.
- Some missing or lost charts were excluded during the study period.

8. CONCLUSSIONS AND RECOMMENDATIONS

8.1 Conclusions

Uterine rupture was commonly encountered obstetrics emergency in the present study. Cephalopelvic disproportion was leading cause (associated factor) of uterine rupture followed by malpresentation and malposition, in this series.

The clinical presentation of uterine rupture was vague and diagnosis depends on high degree of suspicion and awareness.

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.

The maternal morbidity, mortality and perinatal mortality associated with uterine rupture were high. Among patients with uterine rupture, 5(8.3%) of patients had previous history of Cesearean section. Low preoperative hemoglobin and duration of hospital stay before operation >=1hour were significantly associated with maternal death.

8.2 Recommendations

Based on the findings of this study, the following recommendations were given to Attat Hospital.

- ☞ Blood loss during uterine rupture is one of the causes of death. So I suggest adequate resuscitation and blood transfusion before operation.
- ☞ Early intervention decrease maternal mortality rate. So I recommend early surgical intervention for uterine rupture to decrease maternal mortality.
- ☞ Proper patient evaluation and quality follow up can decrease rate of uterine rupture and associated morbidity and mortality. So I suggest proper patient evaluation, quality pre operative and post operative care of the patients.
- ☞ Some outcome indicators were not included in my study because of incomplete documentation and inappropriate chart keeping in Attat Hospital. So I recommend proper chart keeping and complete documentation for the professionals at Attat Hospital and also early recognition of complication and avoid delay after the patients came to the hospital.

REFERENCES

1. Abdella A, Maternal mortality trend in Ethiopia.Ethiop.J.Dev.2010; 24:1.
2. E. Nkwabong, L.Kouam, W. Takang, spontaneous uterine rupture during pregnancy: Case Report and Review of Literature, Afr J Reprod Health 2007; 11[2]:98-103
3. Ibrahim SM, Umar NI, Garba NA, Bukar M, Ibrahim HA, A Reappraisal of ruptured uterus in a suburban Referral Hospital, North-Eastern Nigeria, January 2008.
4. Alan H. DeCherney, Lauren Nathan, T. Murphy Goodwin, Current diagnosis and treatment obstetrics and gynecology, tenth edition, 2007.
5. Yifru Berhan, Asres Berhan, Causes of maternal mortality in Ethiopia: A significant decline in abortion related death, Ethiop J Health Sci September 2014.
6. Amanael Gessessew Mengiste M Melese, 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.
7. W Alemayehu, K Ballard, Wright J. Primary repair of obstetric uterine rupture can be safely undertaken by non-specialist clinicians in rural Ethiopia: a case series of 386 women. BJOG 2013; 120:505–508.
8. M. McCauley, uterine rupture in a rural Hospital in Ethiopia, Yirgalem General Hospital, Yirgalem, SNNPR, Ethiopia, January 2013.
9. WHO, UNICEF, UNFPA, World Bank Group and the United Nations Population Division, Trends in Maternal Mortality: 1990 to 2015. WHO/RHR/15.23.
10. Porreco RP, Clark SL, Belfort MA, et al. The changing specter of uterine rupture. Am J Obstet Gynecol 2009; 200:269
11. Miller DA, Goodwin TM, Gherman RB, Paul RH. Intrapartum rupture of the unscarred uterus. Obstet Gynecol 1997; 89:671.
12. Zwart JJ, Richters JM, Ory F, et al. Uterine rupture in the Netherlands: a nationwide population-based cohort study. BJOG 2009; 116:1069.
13. Ishraq Dhaifalah, Jiri Santavy, Helena Fingerova, uterine rupture during pregnancy and delivery among women attending the Al-TTHAWRA Hospital in Sana'a city Yemen Republic, June 6, 2006.
14. Sheth SS. Results of treatment of rupture of the uterus by suturing.J. Obstet. Gynaec. Brit. Cwlth. 1999; 75: 55–8.
15. Al Qahtani NH, Al Hajeri F. Pregnancy outcome and fertility after complete uterine rupture: a report of 20 pregnancies and a review of the literature. Arch Gynecol Obstet 2011; 284: 1123–6.
16. Kwast BE, Liff JM. Factors associated with maternal mortality in Addis Ababa, Ethiopia. International Journal of Epidemiology 1988; 17(1):115-121.
17. Forsnes EV, Browing JE, Gherman RB. Bladder rupture associated with uterine Rupture. J Reprod Med 2000; 45(3):240-2.
18. A. Admassu, Analysis of ruptured uterus in Debre Markos Hospital, Ethiopia, East African Medical Journal Vol, 81No.1 January 2004.

ANNEX 1: CHECKLISTS

Checklists for data collection on the retrospective cross sectional study on management outcome of uterine rupture among surgically treated patients at Attat Hospital since January 1,2012- December 30,2014GC. The data collectors should be careful to full fill the important information asked on checklist and be polite with Hospital staffs.

MRN ---------- *Code*.……

PART I – Socio - Demographic characteristics

No.	Questions	Categories
01	Age in Years	----------
02	Marital Status	----------
03	Address	----------
04	Occupation	1.Farmer 2.Merchant 3.House wife 4.Student 5.Governmental employer 6. Other(specify)----

PART II-Management outcome of uterine rupture

No.	Questions	Categories
05	Parity	----------
06	Gravidity	----------
07	GA in weeks	----------
08	Did the mother have ANC follow-up?	1.Yes 2.No
09	If yes for Q 07, how many times?	----------
10	Duration of labor, if applicable in hours	----------

11	Duration of hospital stay before operation in hours	----------
12	Duration of hospital stay after operation in days	----------
13	Presenting features	1. Vaginal bleeding 2. Cessation of contraction 3. Abdominal pain 4. Others_____
14	Physical finding	1. Absent fetal heart beat 2. Easly palpable fetal part 3. Shock 4. Others_____
15	Causes of uterine rupture	1.Cephalopelvic Disproportion 2.previous uterine scar 3.Augumentation&Induction 4.Destructive delivery 5. Instrumental delivery 6. Manual removal of the placenta 7. Malpresentation and Malposition 8. Other specify_____
16	Did the patient have previous history of CS?	1.Yes 2 No
17	If question No.15 is yes, what was indication for previous operation?	1. NRFHRP 2. OL 3. CPD 4. Malpresentation 5. Contracted pelvis 6. Failed instrumental delivery 7. Failed Augmentation or Induction 8. Previous CS scar 9. Twin (first breech) 10. Others (specify….)
18	What was diagnosis on admission for the current complain?	1.Uterine rupture 2.Obstructed labor 3.Normal labor 4.Other(specify)----------
19	Fetal Presentation	1.Cephalic 2.Breech 3.Shoulder

20	What was method of patient management?	1.Laparotomy 2.Conservative
21	If managed by operation (laparatomy) what was an Intra operative finding?	----------
22	If operated what Procedure was done Intraoperatively?	1.Repair with BTL 2.TAH 3.STAH 4.Uterine repair
23	Neonatal outcome	1.Dead 2.Alive
24	Post op complication developed?	1.Yes 2.No
25	If question No.23 is yes, what postoperative complication was developed?	1.Wound infection 2.Facial dehiscence 3.Fistula 4.Pelvic collection 5. Others----------
26	Outcome of the patient	1.Improved (favorable outcome) 2.Died (unfavorable outcome)
27	If question No 25 is died, within what time she died?	----------
28	What is her Hgb before the procedure?	----------
29	Blood transfusion	1.Yes 2.No

ASSURANCE OF PRINCIPAL INVESTIGATOR

The undersigned agrees to accept responsibility for the scientific ethical and technical conduct of the research project and provision of required progress reports as per terms and conditions of the college of Health Sciences in effect at the time of grant is forwarded as the result of this application.

Name of the student: Teshome Dandesa

Date: _____ Signature: _____

APPROVAL OF THE ADVISORS

Name of the first advisor: _____

Date: _____ Signature: _____

Name of the second advisor: _____

Date: _____ Signature: _____