PREVALENCE AND ASSOCIATED FACTORS OF UTERINE RUPTURE DURNG LABOR AMONG WOMEN WHO DELIVERED IN DEBRE MARKOS HOSPITAL NORTH WEST ETHIOPIA

BY;

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Prevalence and Associated Factors of Uterine Rupture During labor among Women Who Delivered in Debre Markose Hospital North West Ethiopia

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Abstract

Introduction**:** *Uterine rupture causes high maternal and neonatal mortality in many rural setting in the world. Sub-Sahara Africa still struggles with poor reproductive health indicators. Uterine rupture accounts for about 8% of all maternal deaths.*

Objective: *To assess the prevalence and associated factors of uterine rupture during labor among women who delivered in Debre Markos hospital, 2015.*

Method and Materials: *Facility based cross sectional study design was employed to assess prevalence and associated factors of uterine rupture and the data was abstracted from delivery register, operating theater registrar and patient case files. In Debre Markos referral hospital, north west Ethiopia. A total of 880 sampled cases were taken by using systematic sampling for the study from the cases which were booked in obstetrics ward 2010 to 2014.*

Result*: A 5-years of record review in Debere Markose referral hospital Maternity ward total 16100 deliveries were conducted there was 97.2% complete rate. Prevalence of uterine rupture was 9.5%. Associated factors for uterine rupture in this finding were attending ANC less than two visit had (OR 2.5; 95% CI(), (1.25-5.03) , no use of Partograph follow up of labor had (OR 7.29; 95% CI (3.4- 15.4) ,Obstructed labor had (OR 15.3 .95% CI(7.54-31.1), living in distance >10 km from the hospital had (OR 5.26.; 95% CI 1.8-15.3) maternal age (OR;0.81 95%CI0.18-0.8),Maternal gravidity had (OR;2.165,95%CI 1.6-2.9) and referred from facility had ,(OR;6.5 ,95%CI 2.5-16.2).*

Conclusion and recommendations: Uterine rupture is one of the major causes of maternal morbidity and mortality in Debre Markose referral hospital in North West Ethiopia.80%of uterine rupture was due to obstructed labor. The hospital should build strong collaboration and integration mechanisms with catchment health facility and educational sector to decrease prevalence of uterine rupture and its impact in the zone. Further studies might provide specific interventions to reduce the high prevalence of uterine rupture

Key words: Uterine rupture, Obstetric factors, obstructed labor.

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Firstly, I would like to express my heart full gratitude to my advisors; Professor Tefera Belachaw & Mr Samuel Abdu for their valuable & constructive comments secondly; I would like to acknowledge the efforts of midwives who collected the data and supervisor, My thanks extends the Debre Markose referral hospital staff and administration for their valuable time and genuine collaboration for this research development.

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Abbreviations and acronyms

ANC	Ante Natal Care
CI	Confidence interval
DMRH	Debre Markose referral hospital
EDHS	Ethiopia Demographic and Health Survey
EFMOH	Ethiopia Federal Ministry of Health
EMOC	comprehensive Emergence Obstetric Care
EPI	Info statistical package
FIGO	Federation of International Gynecology and Obstetrics
MDGs	Millennium Development Goals
RH	Reproductive Health
SPSS	Statistical Package for Social Sciences
TBA:	Traditional Birth Attendant
UNFPA	United Nations Population Fund
UNICEF	United Nations Children's Fund
WHO	World Health Organization

Chapter One: Introduction

1.1 Background

Uterine rupture is tearing of the uterine wall during pregnancy or delivery. Rupture of a previously unscarred uterus is usually a catastrophic event resulting in death of the baby, extensive damage to the uterus and sometimes even maternal death from blood loss. The damage to the uterus is sometimes beyond repair and hysterectomy is required (1).

Rupture of the pregnant uterus is a potential obstetric failure and a major cause of maternal death. Uterine rupture stands as a single obstetric accident that exposes the flaws and inequities of health systems and the society at large due to the degree of neglect that it lead to. again, it has the unique potential to impact negatively on Millennium Development Goals 4 and 5. Uterine rupture is a potentially heartbreaking event during childbirth in which the integrity of the myometrial wall is breached (2). In a complete rupture there is full-thickness separation of the uterine wall with the expulsion of the foetus or placenta into the abdominal cavity where-as the overlying serosa or peritoneum is spared in an incomplete rupture(.3,4).This obstetric accident is closely associated with maternal or foetal mortality and morbidity such as bladder rupture, vesicovaginal and rectovaginal fistula, foot drop and psychological trauma(3).

Black African women have a high incidence of contracted pelvis. Juveniles in a population with a high incidenceof contracted pelvis were found to be at high-risk of obstetric complications (5).

Other risk factors for uterine rupture include multiparty and particularly grand multiparity, the use outerotonic drugs to induce or augment labour(1).

Rupture of gravid uterus usually occurs spontaneously caused by cephalopelvic disproportion,malposition and malpresentation. Traumatic rupture occurs following intervention instrumental, manipulator or pharmacologic. Negligible number of ruptures following augmentation or previous caesarean section still point to the fact that obstructed labour and multiparty remain to be the main causes(3)

1.2 Statement of the problem

Worldwide, every year, between 340,000 and half a million women die due to complications of pregnancy and child birth, the majority of these occurring in low income countries. Sub- Sahara Africa bears over 90percent of the burden (6). Uterine rupture is one of the major obstetric complications of labour contributes significantly to maternal and perinatal mortality and morbidity (7).

The occurrence of uterine rupture varies in different parts of the world. While it is rare in high-income countries, it remains a public health problem in low income countries, particularly in Africa and mainly occurring as consequence of prolonged, obstructed labor uterine rupture occurred approximately once every week in Thyolo district hospital, While The incidence of uterine rupture is unknown among those who do not reach a health facility (8). WHO systematic review of maternal mortality and morbidity: the prevalence of uterine rupture in developed country was 0.92 but in least developed country like in Central African were 1.9% ,in Burkina Faso was 18% and in Ethiopia was 25% (1).

Sub-Sahara Africa still struggles with poor reproductive health indicators. Every year, 6000 women die due to complications of pregnancy and delivery. it usually results from prolonged obstructed labour, often in unscarred uterus. However, most cases are usually associated with a combination of risk factors including grand multiparty, advanced age, fetal macrosomia and abnormal placenta ion*,* uterine rupture accounts for about 8% of all maternal deaths. (9)

Better accessibility will lead to improvements in the health of mothers, neonates, as well as to reduce the burden related to childbirth.

Many women are dying at home as the home delivery takes place in 92 % of cases due to culture, taboos , lack of awareness and low socio-economic and poor educational status. Four thousands women die due to complications of delivery per year (10).

In Ethiopia The top four causes of maternal mortality were obstructed labor and uterine rupture (36%), hemorrhage (22%), hypertensive disorders of pregnancy (19%) and sepsis/infection (13%)(11*).*

The leading causes of maternal deaths were obstetric hemorrhage (16 per cent); and uterine rupture (13 per cent) since nearly 52.8 per cent of deliveries was attended at home (12). The

total number of admissions was higher for females account 60.5% of the total due to high frequency of admissions for childbirth and gynecological-obstetric conditions (13).

In WHO health statistics maternal mortality shows annually a1.4% reduction and 45% from the year 1990 E.C Still its improvement is not enough to achieve MDGs (16). In Ethiopia 52.8 per cent of deliveries were attended at home and the rest 48.2% institution delivery. Phase I delay (delay in decision to seek care) contributed to about 25 per cent of maternal deaths (12) Even Currently FMOH has initiated free maternity services at Health center and hospital level (13).A Community based Cross sectional Study of institutional delivery service utilization and associated factors among child bearing age women in Goba Woreda, is 47% and in Sekela district,12.1%(15)

More than one-third of the cause of maternal death was due to obstructed and prolonged labor. Rupture uterus contributes 6.6% of all maternal death (4).

Women die not from disease but during the normal, life-enhancing process of procreation. Most of these deaths could be avoided if preventive measures were taken and adequate care was available (5).

Uterine rupture was the third common cause of death in Addis Ababa, Tikur-Anbessa hospital it is prudent to improve availability, accessibility and utilization of the essential emergency obstetric care services to decrease maternal loss to turn up the millennium development goal. Skilled attendance of labor coupled with early referral to the next higher level for better and timely intervention is equally important (23).

Chapter Two Literature review

2.1 Overview of prevalence of uterine rupture

Developing countries account for 99% (284 000) of the global maternal deaths the majority of which are in sub-Saharan Africa (162 000) and Southern Asia (83 000). These two regions accounted for 85% of global burden, with sub-Saharan Africa alone accounting for 56 %.(16).
A study conducted In Nigeria, The 5-year period of study recorded a total of 16,098 deliveries out of which 95 of the patients had rupture of the gravid uterus, giving a ratio of 1 in 169 deliveries or an incidence of 0.59 %The prevalence ranged between0.006% for women without previous caesarean section from a developed country and 25% for women in a least developed country (3).

2.2 Factors associated with uterine Rupture

A major factor in uterine rupture is obstructed labor. Black African women have a high incidence of contracted pelvis. Juveniles in a population with a high incidence of contracted pelvis were found to be at high-risk of obstetric complications. Other risk factors for uterine rupture include multiparty and particularly grand multiparty, the use of uterotonic drugs to induce or augment tlabour, and rarely intrauterine manipulations such as internal podalic version and breech extraction (1).
Several study from Africa and Asia shows that 75% of case of uterine rupture occurred in women with unscarred uterus .obstructed labour being the most common cause (4).
A study conducted in Nigeria the main associated factors for uterine rupture were. obstructed labour alone 23 (24.2 %) and use of oxytocin in already obstructed labor 22(23.1 %) constituted oxytocin use 13 (13.7%), previous uterine scar 12 (12.6 %), intrauterine manipulation by traditional birth attendants 5 (5.3 %)(3).
In studies from Nigeria, Ghana, Ethiopia, and Bangladesh, about 75% of cases of uterine rupture occurred in women with an unscarred uterus, with obstructed labor being the most common cause(8).
In high income countries, the majority of cases occurring women with previous caesarean section, while in low-income countries, it usually results from prolonged.obstructed labor, often

in unscarred uterus. However, most cases are usually associated with a combination of risk factors including grand multiparty, advanced age, and fetal macrosomia (9).

A six month prospective analysis of incidence, causes and outcome of obstructed labor in Jimma University specialized hospital obstructed labor contribute 45.1% for incidence of uterine rupture(16). The main predictor of death from uterine rupture was a treatment delay of more than 12 hours from the presumed time of rupture (18).

A study in Nigeria ruptured uterus is associated with significant maternal morbidity. Haemorrhage was the most common complication with many patients presenting in shock (3).

Experience of living with uterine rupture is multiple losses. Almost all the participants reported suffering some degree of physical complications associated with uterine rupture. These ranged from urinary symptoms, urinary incontinence from obstetric fistula.(6)

A case control study in Uganda Predisposing factors for uterine rupture were previous cesarean section delivery(OR5.3 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%.

In studies reported In Nepal there were 60% spontaneous uterine rupture, 29% scar rupture and 11% traumatic rupture. Maximum cases were brought from distance of more than 70 kilometers away, between 25 – 29 years of age, of third and fourth gravid at 36 – 40 weeks of gestational period with 68% without antenatal attendance, (10).

Over the past decade, the maternal mortality ratio in Ethiopia has remained static at 676 per 100 000 live births, which equates to a lifetime risk of death from maternal complications of almost 4%. Uterine rupture and obstructed labour account for around 10% of these maternal deaths, (5).

An eight year retrospective description study of maternal death that occurred In Gynecology and obstetrics ward at Jimma hospital uterine rupture was a single commonest cause of maternal mortality accounts (33.2%) The case fatality rate of uterine Rupture 11% in Jimma specialized hospital. (19) and almost 5% in Aria hospital (20)

In the systematic review in sixteen hospital and community based perinatal mortality studies, which were conducted between 1974 and 2013 using data concerning Ethiopia the leading causes of perinatal mortality were mechanical causes like obstructed labor, uterine rupture and malpresentations, which are also some of the major causes of maternal mortality in low income countries(21). Retrospective study in Yemen obstructed labor accounts 83 %, of uterine rupture, contracted pelvis 19 %, previous surgery in 48 %, Oxytocine infusion in 42 %. Grand-multiparty was in 65 % and maternal age over 35 years in 50 %. (25).

Retrospective analysis of mortalities in a tertiary care from Common maternal mortality causes in gynecology and obstetrics wards ruptured uterus accounts (24.0%), Uterine rupture was the third common cause of maternal death in Addis Ababa, Tikur-Anbessa Hospital(22-26).

2.3 Conceptual frame work

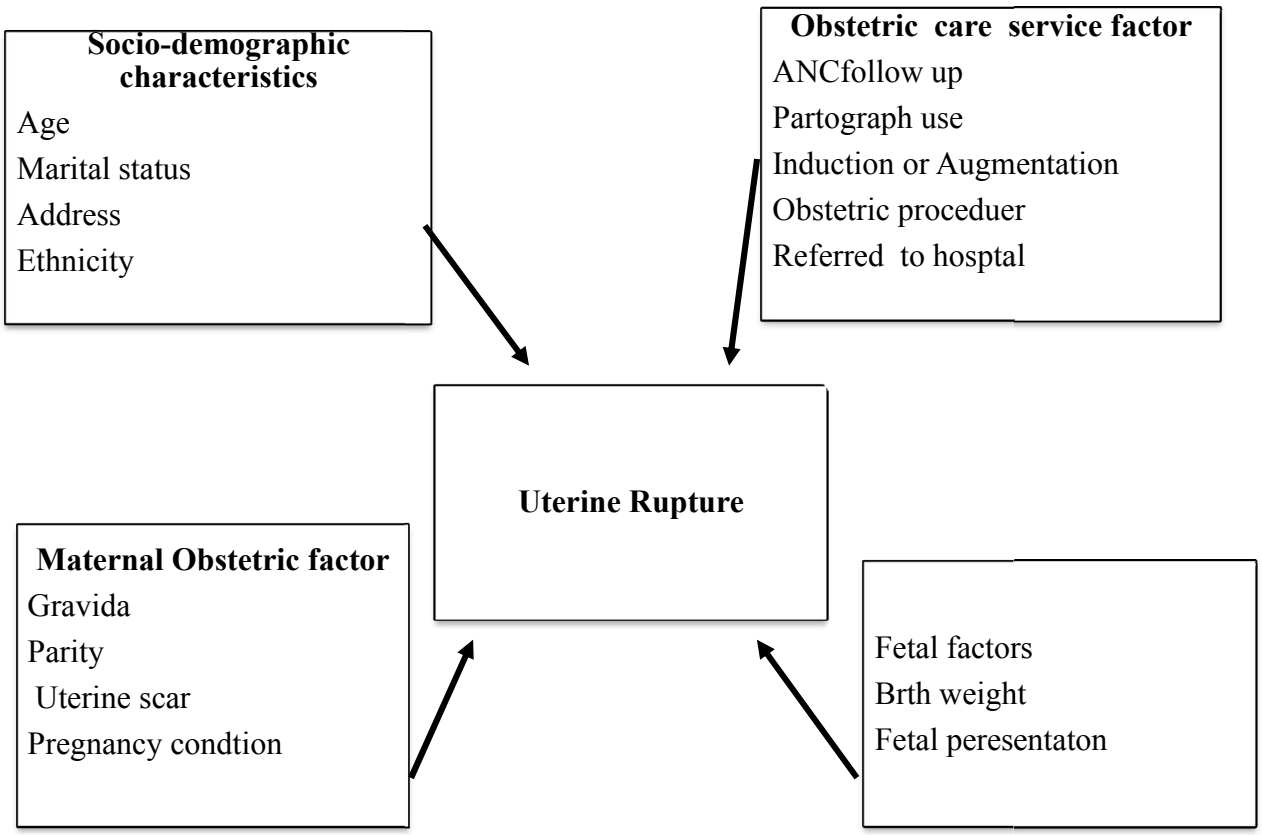

Figure 1: Conceptual frame work of a study Adapted from Mukasa et al. Uterine rupture in a teaching hospital in Mbarara, western Uganda, unmatched case- control study2013.

Significance of the study

Uterine rupture causes high maternal and neonatal mortality in many rural setting in the world. In developing countries like Ethiopia it has the unique potential to impact negatively on Millennium Development Goals 4 and 5 while most maternal deaths are preventable, as the healthcare solutions to prevent or manage complication.

Estimates of maternal mortality is crucial to inform planning and resource allocation and to monitor progress this study is one of measures of maternal mortality that like is compared with like the number of maternal deaths in a population is related both to the risk of mortality associated with each pregnancy or birth. It is possible to prevent most maternal deaths and disabilities with known and effective interventions, but this requires the right kind of information on why women are dying or facing lifelong disabilities. Currently the present study is not enough to have information on the overall levels of maternal mortality and morbidity – health policy makers and practitioners need to understand the underlying factors to be able to prevent future deaths and disabilities.

The finding of this study will be used as source of information and will serves teaching material for the hospital maternal care providers, Nursing and midwifery dep't students and also the paper will be useful to other researchers as reference material while conducting further studies In addition for policy makers will use future planning and appropriate strategies apply specific intervention to decrease maternal, neonatal morbidity and mortality rate .

Chapter Three: Objectives of the study

3.1 General objective

- To assess prevalence and associated factors of uterine rupture during labor among women who delivered and booked from 2010 to 2015E.c at Debre Markose referral hospital North West Ethiopia in 2015**.**

3.2 Specific objective

- To determine the prevalence of uterine rupture during labor among women who delivered and booked from January1st 2010 to December 31s 2014 in Debre Markose referral hospital in 2015
- To identify associated factors of uterine rupture during labor among women who gave birth from 2010 to 2014 in Debre Markose referral hospital in 2015.

Chapter Four: Method and Materials

4.1 Study area and study Period

Debre Markose hospital is a public hospital found in East Go jam zone, which is located in Amhara regional administrative. It is 300km North West of Addis Ababa., The hospital provides health service to more than 2.0 million populations. Currently about 100 health centers and two district hospitals are available in the catchment area of the referral hospital and there are 109 Nurse, one emergency surgeon and Gynecologic and obstetric ward has 19 midwifes, one gynecologist and about 3220 delivery conducted per year from annual hospital report, in obstetric ward and the study was conducted on March to April 2015.

4.2 Study design

- Facility based Cross sectionals study with abstraction method was employed.

4.3 Population

4.3.1 Source of population

- All case notes of clients who received care for delivery in obstetric ward in Debre Markose referral hospital

4.3.2 Study population.

- All sampled case notes of clients who received care for delivery in Debere Markos referral hospital, from January1st 2010_December 31st2014.

4.3.3 Inclusion criteria

- All cases notes of delivery after 28weeks of gestational age that were managed in obstetric case from January1st 2010 to December31st 2014.

4.3.4. Exclusion criteria

- Pregnancy terminated before 28 weeks of Gestational age

4.4 Sample size and sampling Techniques

4.4.1 Sample size Determination

The sample size is determined by using single population proportion formula,

$$n = \frac{(Z\alpha/_2)^2 P (1-P)}{d^2}$$

Where:

n = sample size

P = WHO systematic review of maternal mortality and morbidity : In Ethiopia 2005 The prevalence of uterine rupture(25%)

d = margin of error, 3%

$Z\alpha/_2$ = critical value at 95% level of confidence (1.96)

$$n = \frac{(Z\alpha/_2)^2 P (1-P)}{d^2} = \frac{(1.96)^2 0.25 (1-0.25)}{(0.03)^2}$$

n=800

Since the total source population admission in obstetric ward within five year is 16100 this is greater than 10000.

Finally by adding 10% for missed data, the total sample size was

***Nf*= 880**

4.4.2 Sampling technique

Systematic sampling technique was used to select the study subjects from Obstetrics a registry book .the 1st case was select by lottery method after that using K interval for the rest cases that mean every 18 interval of registration serial number was taken for the study.

$$k = \frac{N}{Nf}$$

N=16,100: Which is source of population

$$K = \frac{16,100}{880}$$

$N_{f=\underline{880}}$

K=18

4.5 Study Variables

4.5.1 Dependant variable

Uterine rupture

4.5.2 In dependant variable

Socio-demographic factors

Maternal age

Marital status

Ethnicity

Address

Obstetrics factors*:*

ANC visit

Gravida , Parity

Obstructed labor

Induction/Augmentation

Parhograph use during labor

Referred from facility

Pregnancy condition

Pervious uterine scar or Pervious C/s delivery

Obstetric procedure (instrumentation)

Fetal presentation

Birth weight

4.6 Data collection instrument and methods

Quantitative data

Four data collectors who have diploma in Midwifery and who work in maternity ward in Motta hospital and one supervisor, who has Bsc in Midwifery was recruited. The overall data collection process was coordinated and facilitated by the principal investigator. Structured checklist was used to collect data from delivery registers, operating theatre registers and patient case file. The questionnaires was adapted from Uganda those other researchers used for similar purpose.

4.7 Operational definitions and definitions of terms

- **Augmentation of labor** facilitating the existing labor using at least one is used; oxytocic drug such as **(** Prostaglandin, misoprostol
- **Induction of Labor** Initiation of labor before onset of labor by using at least one **;** Tran cervical Catheter, Oxytocic drug such as **(** Prostaglandin, misoprostol
- **Gravidity -** is the total number of pregnancies normal or abnormal
- **Maternal mortality rate -** number of maternal death in given period per 100000women of a reproductive age during the same time period
- **Obstetric fistula-** Fistulas form between the urinary bladder and the rectum or the vagina secondary to Injury of childbearing from prolonged and obstructed labor.
- **Obstetric procedure -** Instrumentation (forceps use) Intrauterine manipulation (external cephalic version, internal podalic version, breech extraction, shoulder dystocia, manual extraction of placenta), fungal pressure.
- **Obstructed labor** failure of decent of fetal part despite of adequate contraction due to combinations of the abnormalities often interacts to produce dysfunctional labor. And prolonged labor such as cephalopelvic disproportion and failure to progress fetal part.
- **Parity -** total number of delivery that occur after 20 wks of gestational age.
- **Uterine rupture during labor –** Tearing of the uterine wall either partially or complete during pregnancy and labor occurred after 28wks of gestational age, due to Obstetric case diagnosed either clinically and later confirmed at laparotomy.

4.8 Method of Data Analysis

4. Quantitative Data

EPI –Data Statistical software version 3.1 , & SPSS version 16 were used for data entry and analysis. After organizing & cleaning the data, important characteristics of study subjects. The data were expressed in percentages, graphs, means and standard deviations to all variables that are related to the objectives of the study. Univariate analysis was done to describe some characteristics of study subjects. Chi-square (X^2) and cross tabulation was done to see association, between the independent variables and the dependent variable. P value at 0.05 consider statistically significant and candidate to the multi variable logistic regression model. Finally multivariate analysis using forward stepwise binary logistic regression technique was done to evaluate independent effect of each variable on uterine rupture by controlling the effect of others.

4.9 Data quality Assurance

To assure the quality of data, properly designed data collection instruments was adapted. Training was given for data collectors and supervisors by the principal investigator. Everyday all of the collected data was reviewed and checked for completeness and relevance by the supervisors and principal investigator.

4.10 Pre Test

Training was given for data collectors and supervisor by the principal investigator .The questionnaires was pre-tested before the actual data collection days on 5% (44) of the sampled obstetrics case records in Motta district hospital obstetrics ward which is not selected for the study area, inline to this during data collection supervisors checked the delivery registers

4.11 Ethical considerations

Ethical clearance letter was obtained from ethical review committee of Jimma university, college of public health and medical science and a formal letter also obtained from Jimma University department of Nursing and Midwifery and was submitted to Debre Markose referral hospital and permit ion of hospital was obtain from hospital administrative.

4.12 Communication and Dissemination plan

The results of the study will disseminated and presented to the department of Maternity Nursing, as part of partial fulfillment of the requirements for the Masters of Science degree in maternity nursing also disseminated to Jimma university department of Nursing and Midwifery, Debre Markose referral hospital and other relevant organizations was informed to used the findings for modification of their service delivery strategies. Attempts will be made to present the results on scientific conferences and to publish the results of the study on local and international truth worthfull journals.

Chapter Five: Results

5.1 Socio-demographic characteristics

The 5-years period of record review in Debre Markose referral hospital Maternity ward total of 16100 deliveries were conducted out of which from 880 sampled study population 854(97.1%)response rate . the mean maternal age was 28 years with SD 7.2and majority 61.8% of the study subject were age between 20-34 years. Majority 542(63.5%) of the pregnant women lived more than 10km from the hospital, and 311(36.5%) of them lived within distance of 10km from the hospital and distribution of marital status 661(77.4%) were married, 122(14.3%) divorced.

Table 1; Socio-demographic characteristics of pregnant woman who delivered in Debere Markose hospital from January2010- December 2014.

Variable	Category	N(880)	Percent(%)
Marital status	Single	51.0	5.90
	Married	661	77.4
	Divorce	122	14.3
	Widowed	20.0	2.40
Living within a distance of 10 km from hospital	Yes	311	36.5
	No	542	63.5
Maternal age Mean age=28	<20	105	12.3
	20-34	528	61.8
	>=35	221	25.9

The graph below shows age distribution of the study population was 207(24.27 %) between 20 – 24 years, 198 (23.21%) between 25-29 years, 140 (16.41%) between 35-39years, 123 (14.42%) between, 30-34year 104(12.19%) between 15-19years,72(8.44%) between 40-44years and 9(1.06%)>45years old age.

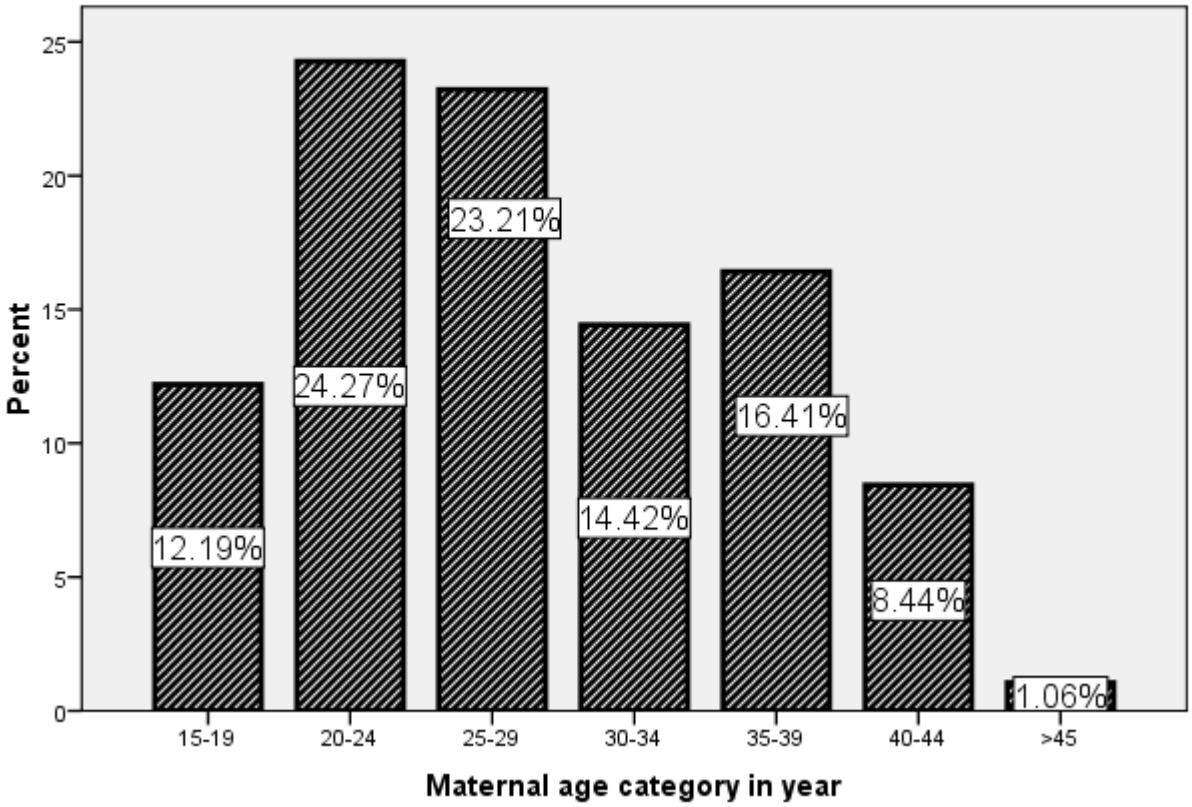

Figure 2 ; Age distribution of delivered woman in Debere Markose hospital from January 2010 to December 2014 (N=880).

The graph below indicates majority 542(63.54) of study population live greater than 10 Km from the hospital and 311(36.46) of them live within 10 Km from the hospital.

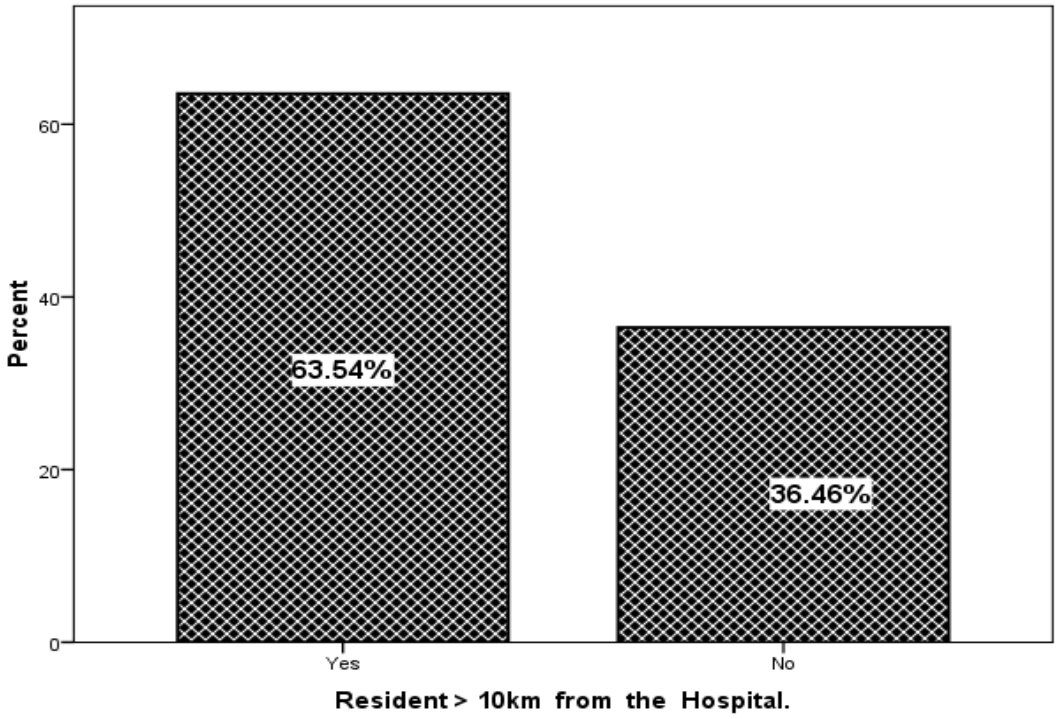

Figure 3; Residents of a woman who delivered in Debre Markose hospital from January 2010-december2014, (N=880)

The figure below describes distribution of mode of delivery in the hospital. More than half (57.49%) from total delivery conducted was spontaneous vaginal delivery, 24.12% was instrumental delivery and 14.4% cesarean section delivery and 3.98% were destructive delivery.

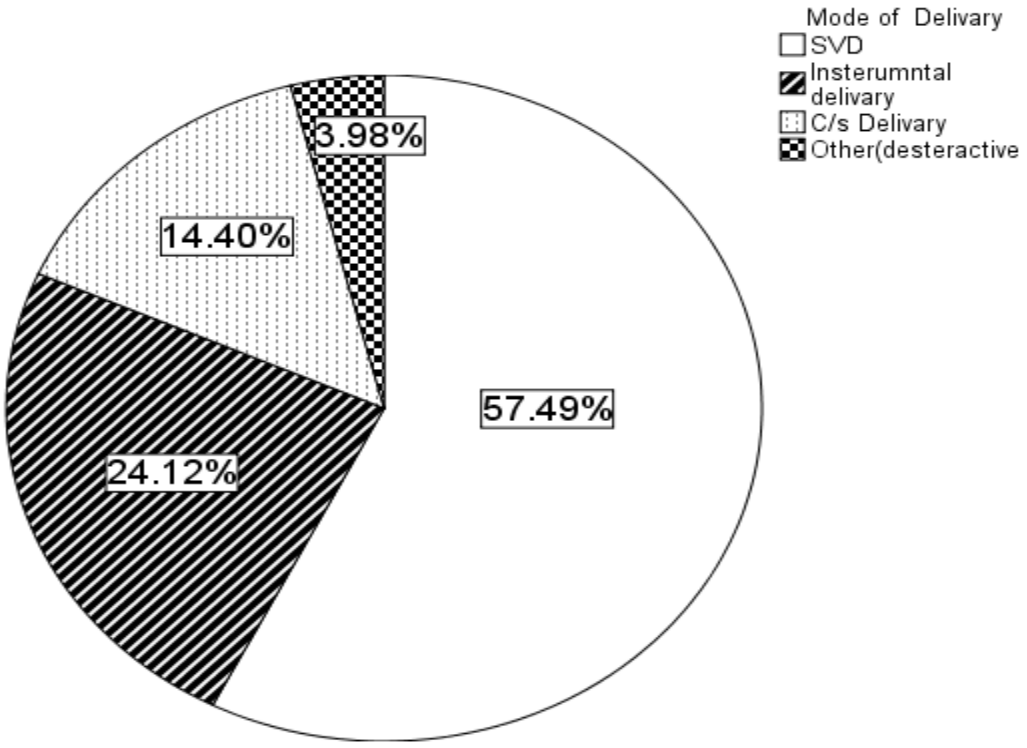

Figure 4; distribution of Mode of delivery in Debere Markose hospital from January 2010 to December 2014, (N=880).

The figure below shows that prevalence of uterine rupture among women delivered in Debre Markose hospital was 9.5% .and 90.5%were free from this catastrophic event.

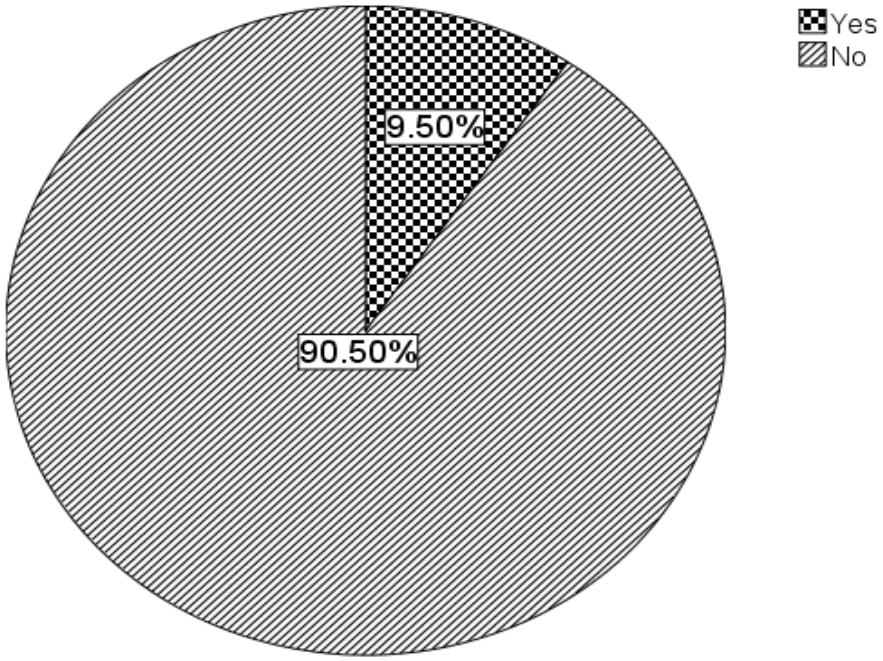

Figure 5; Prevalence of uterine rupture among woman who give birth in Debre Markose hospital from January2010- December2014, (N=880)

The following figure shows trends of prevalence of uterine rupture in the five years period from 2010 to 2014 in Debre Markose hospital, which was 22.5%, 21.5%, 19.4%,18.7%,18.3% in 2010,2011,2012,2013,2014 respectively.

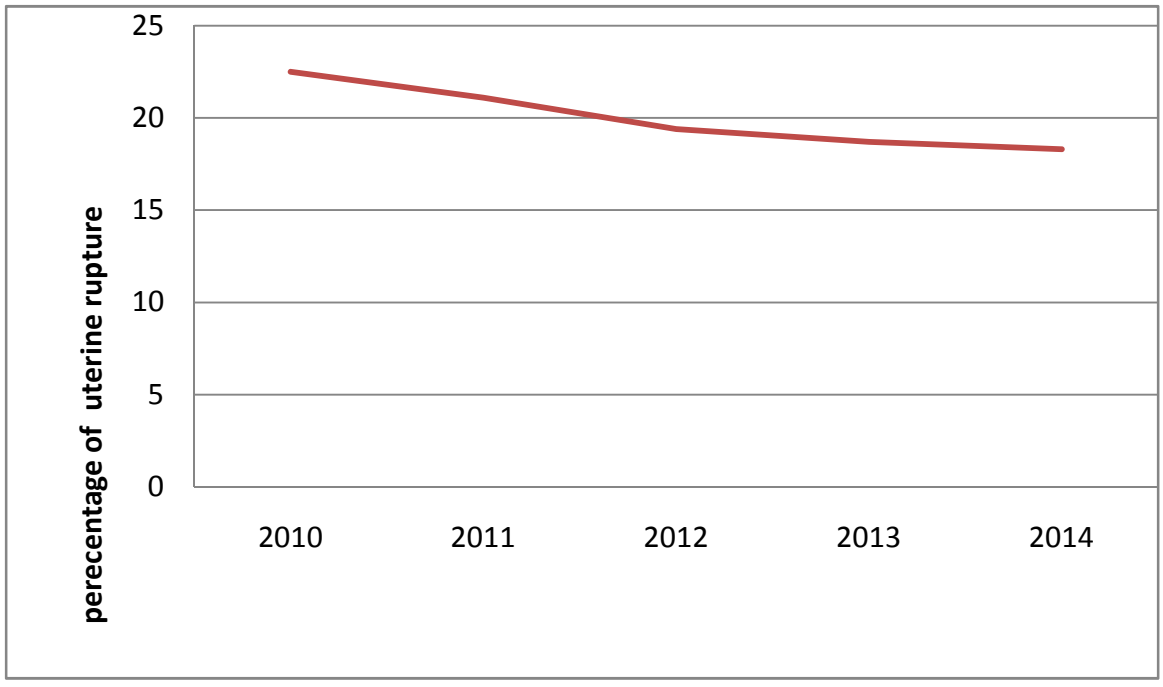

Figure 6; Trends of prevalence of uterine rupture from 2010 to 2014 among woman who gave birth in Debre Markose hospital (n=81).

5.2; Factors associated with occurrence of obstetric uterine rupture

The table below illustrates 81 of the patients faced rupture of the gravid uterus from this Majority60(74.5%) of the uterine rupture cases were para less than five ,25.5%of them were grand multi para. The mean age was 28, more than halve 50(61.7%) were age between 20-34years,25(30.9%) greater than 35 year ,the rest6(7.4%) were age not more than 19 years.

Table 2; Association of maternal obstetric characteristics of pregnant woman who delivered in Debre Markose hospital and occurrence of uterine rupture from January 2010-December 2014.

Variable	Category	Occurrence of Uterine rupture(n=81)			
		Number	Percent (%)	P-value	X^2
Maternal age	<20	6	7.40		
Mean age=28				0.273	2.599
SD=7.2	20-34	50	61.7		
	>=35	25	30.9		
parity	<=4	60	74.5	0.03	2.034
Mean 2.7(SD=					
Minimum null	>4	21	25.5	0.04	1.136
Maximum 11					
Uterine scar	Yes	17	21.0	0.001	17.510
	No	64	79.0	0.001	38.479
Pregnancy condition	single	79	97.5		
	Multiple	2.0	2.50	0.136	2.91

Multiple response were possible cannot add up to 100%

Table 3; Association of obstetric care service and fetal factor with occurrence of uterine rupture who delivered in Debere Markose hospital and occurrence of uterine rupture from January 2010-December 2014 ,(n=81).

Variable	Category	Occurrence of Uterine rupture(n=81) Number	Percent (%)	p-value	X^2
Pantograph use during labor	Yes	15	18.5	0.002	69.725
	No	66	81.5		
Augmentation or Induction				0.04	3.214
	Yes	16	19.7		
	No	65	80.3		
Obstetric procedure	Yes	22	27.2	0.50	.451
	No	59	72.8		
Referred from facility	Yes	73	90.1		
	No	8	9.90	0.001	35.091
Fetal presentation	Vertex	21	25.9		
	Breach	8	9.90		
	face	27	33.3	0.001	3.891
	brow	25	30.9		
Fetal birth weight Mean=2.89,(SD=0.58)	<=2.5kg	12	15.5		
	2.5-3.9kg	55	66.0	0.001	19.821
	>=4kg	15	18.5		

The above table shows Partograph use during labor, Augmentation or Induction, Obstetric procuder, referred from facility; fetal presentation and fetal birth weight had association with occurrence of uterine rupture.

*****Multiple response were possible cannot add up to 100%.

Table 4; logistic regression result of factor associated with uterine rupture among women delivered in Debere Markose hospital from January 2010 -2014(N=880).

Variables	Uterine rupture (n=81)		OR (95% CI)		
Categories(N=880)	Yes	No	Crude	Adjusted	P-value
Attending ANC					
Lesst than two	60	312	**4.10(2.4-67)**	**2.50 (1.25-5.03)**	
Greater than two	21	452	**1.00**	**1.00**	0.007
Parthograph use					
Yes	15	510	**1.00**	**1.00**	
No	66	263	**8.50(4.7-15.2)**	**7.29(3.4- 15.4**)	0.0001
Obstructed labor					
Yes	65	119	**22.3(12.5-39.9)**	**15.32(7.54-31.1)**	
No	16	654	**1.00**	**1.00**	0.0001
Referred from facility					
Yes	73	434	**7.10 (1.89-8.78)**	**6.49 (2.5-16.2)**	0.001
No	8	339	**1.00**	**1.00**	
Resident>10km from hospital					
Yes	66	477	**2.74 (1.53-4.8)**	**5.26(1.8-15.3)**	0.02
No	15	296	**1.00**	**1.00**	
Gravidity Mean=3.8			**1.285(1.2-1.42)**	**2.16 (1.6-2.9)**	0.0001
Maternal age Mean=28			**1.026(0.7-1.0)**	**0.815(0.18-0.8)**	0.001

R^2=0.63

Associated factors for uterine rupture in this finding were Attending ANC less than two visit had (OR; 2.5 95% CI (1.25-5.03), non use of parthograph follow up of labor had (OR 7.3 95% CI (3.4- 15.4) Obstructed labor (OR ; 15.3 .95% CI(7.54-31.1), living in distance >10 km from the hospital had (OR 5.26.; 95% CI 1.8-15.3) maternal age less likely to occur uterine rupture (OR;0.81 95%CI0.18-0.8) a unit increase in gravidity (OR;2.165,95%CI 1.6-2.9) and referred from facility had occurrence uterine rupture (OR;6.5 ,95%CI 2.5-16.2) (Table: 4)

Table 5; Maternal complication of uterine rupture in Debere Markose hospital from January2010 to December2014, (n=81)

Maternal Complication	Occurrences of Uterine rupture(n=81)	
	Number	**Percent (%)**
Bladder rupture	13	16.0
Vesicovaginal Fistula	10	12.30
Severeblood loss(blood transfusion at least two unit of blood	72	88.8
Rectovaginal fistula	5	6 .10
Admitted Blood pressure <=90/60mmhg	61	75.3
Total abdominal Hysterectomy	42	51.8
Subtotal abdominal Hysterectomy	19	23.6
Repair of uterus	20	24.6
Maternal death	3	18.8

N.B; Percentage of maternal mortality was done by using Fisher Exact test.

Maternal complications were: total abdominal hysterectomy 42(51.8%) , subtotal hysterectomy 19(23.4%) and uterine repair 20(24.6%) , from 81 uterine rupture cases 72 (88.8%) required at least one units of blood transfusion ,10(12.3% face vesico vaginal fistula and maternal mortality accounts 3(18.8)among women with rupture of gravid uterus(Table :5).

Chapter Six: Discussion

For less developed countries, uterine rupture is a more prevalent and serious problem. WHO systematic review of maternal mortality and morbidity: the prevalence of uterine rupture in developed country was 0.92% but in least developed country like in Central African were 1.9%, in Burkina Faso was 18% and in Ethiopia was 25% (1) but in this finding the prevalence of uterine rupture was 9.5% it decreased by 38% possible reason might be change in health policy, study period and study design.

A total of 16100 , deliveries in Debere Markose hospital within the five year period of record review from 880 sampled cases there were 81 uterine rupture cases making an incidence of 1:200 which is similar with a study done in Uganda ,but lower than the incidence in Ghana ,which were 1:124 ,Ethiopia it were 1:100 , and higher in study in Tanzania which were 1.2:500 delivers (1,2,16). This was high incidence of uterine rupture than Tanzania is an indicator of poor obstetric care, poor accessibility to the few available comprehensive Emergence Obstetric Care (EmoC) facilities in the zone.

Majority60 (74.5%) of the uterine rupture cases were Para less than five ,25.5%of them were greater than Para five which has agreement with a study in Tanzania (4),80%of uterine rupture were Para one to four which is middle reproductive age (20-34)year age was at high risk because both are developing country and similar socio demographic characteristics but contrast in most literature like study in Ghana As many as 26(63.4%) of uterine rupture were between 30 and 45 years. Fourteen (41.5%) were grand multipara, most cases are usually associated with a combination of risk, advanced age (1, 3, 4).

Among 81 uterine rupture cases 16(19.7%), were due to Augmentation or Induction and 22(27.2%) due to instrumental delivery this favours in astudy done in Nigeria augmentation and induction in already obstructed labor contributed 17.5%of uterine rupture the reason might be similarity in socio demographic and biological similarity of study subject

In this finding women who faced uterine rupture had fetal presentation of 21(25.9%) vertex, 8(9.9%) breach, 27(33.3) Face, 25(30.9) were brow presentation and 15(18.5%) had birth weight greater than 4 kg has agreement a study done in North-eastern Nigeria rupture of gravid uterus usually occurs spontaneously caused by cephalopelvic disproportion malposition and malpresentation(3).possible reason might be biological similarity of study subject and socio demographic characteristics .

The ages of clients ranged between 15 and 45 years with a mean 28 ;SD (7.2) and 50(61.7%) were age 20-34years,25(30.9%) greater than 35 year ,the rest 6(7.4%) were age not more than 19 years. The increase frequency of uterine rupture in age group 30 – 34 years is favors with findings from a study in Uganda (9) possible reason might be similarity in study design and socio demographic characteristics.

In this finding from all cases 65(80.2%) uterine rupture were due to obstructed labor has agreement in reports from , Ghana, Ethiopia and Bangladesh indicated that about 75% of cases of uterine rupture were associated with unscarred uterus (1) the reason is due to similarity in socio demographic characteristics and health service availability and accessibility.

Obstructed labor can cause up to 93 % uterine rupture in Ethiopia (25) and 68.5%in Uganda which is highly contributing factor and most prevalent than a study done in Nigeria it account 24.5%(3). Possible reason might be different socio demographic characteristics with study population, in health policy of the country and service availability.

In this study 66(81.5%) among uterine rupture cases and patient lived more than 10km from the hospital and had the due to lack access of transportation system, and low ANC coverage it accounts 487(57.2%) which is lower than national ANC coverage of Ethiopia(86%) at least one ANC visit,92% in Uganda,95% in Tanzania (9)possible reason might be Attending ANC variation across acountry and creates an opportunity to plan time ,place and mode of delivery . More than half, 66%of uterine rupture cases had fetal birth weight of 2.5 to3.9kg and 84% in

Tanzania, 17.5% had greater than or equal to 4kg which is contrast in Tanzania it account 8% (9).

Uterine scar is a leading cause in the western world, Most cases of uterine rupture in developing countries are primarily spontaneous with Prolonged/obstructed labour being the commonest etiologic factor (24) which was also a fact in this study most of the patients (80%) faced to have uterine rupture spontaneously and Multiparty are reported from developing countries as causes, due to obstructed labor, has agreement in this finding, 74.5% of uterine rupture were multi para (2, 3, 4)

In this finding associated factors for uterine rupture were Attending ANC less than two visit had (OR; 2.5 95% CI (1.25-5.03), non use of parthograph follow up of labor had (OR 7.3 95% CI (3.4- 15.4) Obstructed labor (OR ; 15.3 .95% CI(7.54-31.1), living in distance >10 km from the hospital had (OR 5.26.; 95% CI 1.8-15.3) occurance of uterine rupture was (OR;0.81 95%CI 0.18-0.8) less likely to occure as a unit increase in maternal age , gravidity had (OR;2.165,95%CI 1.6-2.9) and referred from facility had (OR;6.5 ,95%CI 2.5-16.2) (Table: 4).Has agreement with a study in western Uganda from which ,predisposing factor for uterine rupture for uterine rupture were;<4 antenatal visits (living in a distance >5 km from the facility,parity>5No parthograph follow up labor referred from facility possible explanation should be similarity in policy of the country,socio demographic similariy.

The life-threatening seriousness of uterine rupture is draw attention to by the fact that the maternal circulatory system delivers approximately 500 mL of blood to the term uterus every minute. a majority of women requiring blood replacement exceeding five units and hysterectomy, with accompanying loss of future childbearing potential(10.16,23)) this is also true in this finding.

Most of the a woman with uterine rupture faced : 42(51.8%) total abdominal hysterectomy, subtotal hysterectomy 19(23.4%) and uterine repair 20(24.6%) ,VVF 12.3% similar with Ghana

24.4% subtotal abdominal hysterectomy and 43.8% TAH) and 23.3% uterine repair (4). ,10(12.3% face) vesico vaginal fistula .posible reason might be severe blood loss during delivary and high perevalance of anemia during pregnancy.

Uterine rupture contributes 18.8% of maternal death from all obstetrics maternal death. It favors with analysis of mortalities in a tertiary care hospital in Northeast Ethiopia ruptured uterus account(18%) in obstetrics ward (22) possible explanation might be similarity in health delivary system in the region .

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As high as 88.8% of women with uterine rupture in this study required blood transfusion, 90.1% of them were referred from facility. This has agreement with a study in Tanzania (16), all cases of uterine rupture (100%) need blood transfusion this is might be the poor hemodynamic state in which the patients arrived and the high prevalence of anemia in pregnancy which indicates comprensive emergency obstetric care is very essential to save maternal life and the existing EmoC is not enough for the zone.

One explanation for this poor health among women is service unavailability and low utilization of the available modern health services like ANC even if it is free service in nationaly .

Strength and limitation of the study

Strength of the study

- The study tried to generate as rich information as possible by detail assessment of Patient case files, delivery registry and operating theater on Prevalence of uterine rupture, factors associated with uterine rupture.
- The study used both urban and rural catchment population.

Limitation of the study

- Some important information like educational status and house hold income is not found on the register book not included in the study.

Chapter Seven: Conclusion and Recommendation

7.1 Conclusion

Uterine rupture is one of the major causes of maternal morbidity and mortality in Debere Markos referral hospital in North West Ethiopia.The prevalence was still high, even it appears to decrease over the last ten years period from national figure of Ethiopia.

There were various predisposing factors associated with ruptured uterus although many patients had more than one etiologic factor, the most frequent factor was obstructed labor, living more than 10km from hospital , being 20-34year old age,multi parity and non attending ANC,have no parthograph follow up and delay referral had contribution for occurrence of uterine rupture in this hospital .Currently the free delivery package introduced by the government of Ethiopia it attempts at addressing the issue of financial barrier but the high cost of transportation and the poor state of road net work really has great impact on the effectiveness of this intervention .

7.2 Recommendation

The hospital should build strong collaboration and integration mechanisms with health facility health department educational sector of the zone

- Promote ANC in the hospital as well as health facility
- Zone health department should promote information education and communication on safe mother hood at community level .
- Empowerment of the girl child through education and delaying first pregnancy
- Increase utilization of partograph during labor in the hospital as well as health facility
- Promotion of early referral system and feedback.

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Annex I Consent form.

Jimma University Collage of public Health Medical Science Department of Maternity Nursing questionnaire on Prevalence and associated factors of uterine rupture at Debre Markose Referral Hospital 2015.

Verbal consent

Greeting Hallo

My name is----------I am from Jimma University----------I am of principal investigator of research. I would like to collect data from patient files. The result of this study will help an input to improve the Maternal and child health service. The Confidentiality of Information and anomeity was maintained.

Name of the supervisor----------sign----------

Data collector name

Date …….

Annex II CHECKLIST

Adapted checklist to assess prevalence and associated factors of uterine rupture in Debre Markose hospital on 2015. (Source; a study in western Uganda 2013on assesment of uterine rupture)

No.	Questions	Coding category	Remark
Part I	**Characteristics of study population**		
101	Maternal age (age in years)	1. Less than 20 2. 20–25 3. 25–30 4. 30 -35 5. >35	
102	Marital status	1. Single 2. Married 3. Divorced 4. Widowed	
103	Resident	1. ≤10km 2. >10km	Distance in km hospital to kebele
Part II	**Factor associated for uterine rupture**		
201	Parity	1. null 2. 1–3	

		3. 4- 5 4. ≥5	
202	Gravidity	1. 1 2. 2-4 3. >5	
203	Attended antenatal care	1. less than two 2. greater than or equal to two	
204	Fetal Presentation	1. Vertex 2. Breach 3. Face 4. Brow 5. Unknown	
205	Birth weight	1. ≤2.5kg 2. 2.5-3.9kg 3. ≥ 4kg	
206	Pervious uterine scar(C/s)	1. Yes 2. No	
207	Mode of delivery	1. SVD 2. Instrumental 3. C/S 4. Other(destructive)	

208	Augmentation or Induction of labor	1. Yes 2. No	
209	Pregnancy condition	1. single 2. Multiple	
210	Obstructed labor	1. Yes 2. No	
211	Partograph used during labour	1. Yes 2. No	
212	Referral	1. From health center 2. Self referral	
PartIII	**Questions on maternal morbidity**		
301	Uterine rupture	1. Yes 2. No	
302	Year of uterine rupture happen	1. 2010 2. 2011 3. 2012 4. 2013 5. 2014	

303	Severe blood loss or transfusion at least two unit of blood	1. Yes 2. No	
304	Bladder rupture	1. Yes 2. No	
305	Hysterectomy done	1. Yes 2. No	
306	Type of Management	1. TAH 2. Subtotal 3. Repair without BTL 4. Repair with BTL	
307	Vesico vaginal fistula	1. Yes 2. No	
308	Recto vaginal fistula	1. Yes 2. No	
309	Maternal Death	1. Yes 2. No	

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: _Tinsaye kassa_____
Department Maternity Nursing
Signature: _____
Name of the institution: Jimma University
Date of submission: __10/06/2015_____

This reaserch paper has been submitted for collage of public health after examination with my approval as university advisors.

Name of the first advisor; professor Tefera Belachaw(MD, Msc,PhD)

Signature of the first advisor _____

Name of second advisor ;Mr Samuel Abdu(BSc. N, MSc. in Maternity Nursing)

Signature of the second advisor _____