Acta Scientific Women's Health (ISSN: 2582-3205)

Volume 2 Issue 3 March 2020

Research Article

Assessment of Uterine Rupture and Its Associated Factors among Women Managed for Obstetric Care in Debre Markos Referral Hospital, Amhara Region, Northeast, Ethiopia, 2018

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Received: December 12, 2019

Published: February 21, 2020

Abstract

Background: Maternal morbidity and mortality is one of the most challenging health problems that concern the globe over the years, especially in sub-Saharan Africa. Uterine rupture is one of the per partum complications which cause nearly about one out of thirteen maternal deaths and the remaining survivors encounter immediate and long-term complications. So aim of this study was to assess magnitude of uterine rupture and its associated factors among obstetric care women during per partum period in Debre Markos referral hospital.

Methods: An institution based cross-sectional study was employed. A total of 378 women were selected for the study. All charts of mothers who were systematically selected among received obstetric care service in the hospital were included for the study. Data were collected through structured checklist and entered by Epi-Data version 3.1 and analysed using SPSS version 23. Multiple logistic regression analysis was conducted to identify independent predictors of uterine rupture.

Results: In this study, the magnitude of uterine rupture was 8.7%. Among uterine ruptured cases, 24 (72.7%) were not followed with partograph throughout the course of labour. Those who were not followed by partograph had significant association with uterine rupture [AOR = 6.54; 95% CI: 1.99 - 21.52]. And also among mothers who had obstructed labour had factor for uterine rapture [AOR = 0.04; 95% CI = 0.02 - 0.10].

Conclusion and Recommendation: The study revealed that the magnitude of uterine rupture is high in Debre Markos referral hospital compared to other studies conducted in Ethiopia. Those mothers who were not followed by partograph and who had obstructed labour were significantly associated with uterine rupture. So, health care providers had better to follow labouring mothers with partograph and mothers themselves should seek care in the near health institutions when they start labour.

Keywords: Uterine Rupture; Obstetric Care; Per-Partum Period; Prevalence; Debre Markos

Background

Uterine rupture is defined as tearing of the uterine wall during pregnancy or delivery [1]. It 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 entails [2].

Uterine rupture is estimated that it accounts for 5% of maternal mortality in the United States annually [3]. In less and least developed countries, uterine rupture is an important cause of maternal mortality, accounting for as many as 9.3% of maternal deaths in one Indian study [4]. Study done in South Africa showed that ruptured uterus causes 6.2% of deaths due to direct causes and 3.7% of all deaths (1.9% due to rupture of an unscarred uterus and 1.8% due to rupture of a scarred uterus) [5]. Whereas, In Ethiopia, uterine rupture and obstructed labour account for around 10% of these maternal deaths [6].

In Ethiopia, obstructed labor and uterine rupture accounts (36%) from top four causes of maternal mortality. According to the study conducted in Addis Ababa, uterine rupture was the third common cause of death. An 8-year retrospective description study conducted in Jimma specialized Hospital showed that Uterine rup-

ture was a single commonest cause of maternal mortality accounts (33.2%) with the case fatality rate of 11% and almost 5% in Aria Hospital [1]. According to the study done in Mizan Aman Ethiopia (8.3%) intra operative maternal death and 11(91.7%) post-operative death, making case fatality rate of 10.4% from ruptured uterus [7]. Other study conducted in Adigerate, Ethiopia maternal death is accounts 24% related from uterine rupture complication [8].

Based on the severity of this problem, the Ethiopian Federal Ministry of Health has initiated free maternity services at health center and hospital level recently, despite the fact that maternal mortality still high due to complication related with uterine rupture. So we hope our study will contribute for reducing the current uterine rapture complications and related deaths in Ethiopia.

Therefore, the purpose of this study was to assess magnitude of uterine rupture and its associated factors among obstetric care women during per partum period in Debre Markos referral hospital. This study is significant for governmental organizations involved in the health sector including those at federal, regional and Woreda level and health care providers as a reference to identify their gap, further designing feasible strategic plan and implement to reduce disrespectful and abusive related maternal morbidity during facility based child birth. And also it will be used as an input for further study.

Materials and Methods

Study area and period

The study was conducted from January 05/2018 to March 12/2018 at Debre Markos referral hospital, Northwest, Ethiopia. The hospital is found in Debre Markos town at 300 km. Northwest of Addis Ababa and 265 km. Southeast of Bahir Dar, Capital city of the Amhara. The hospital was established in 1959. It is providing a wide range of services in different units including genecology and obstetrics, internal medicine, surgery, paediatrics, psychiatry, physiotherapy, ophthalmology, dermatology, ART clinic, laboratory as well as outpatient and emergency units. Debre Markos town has a total population of 62,497, of whom 29,921 are males and 32,576 are females. There are 7 health posts, 3 higher and 5 medium private clinics, 3 health centres and 1 referral hospitals in the town.

Study design

An institution based cross-sectional study was conducted.

Source population

All charts of mothers received obstetric care service in Debre Markos Referral Hospital.

Study population

Those maternal cards systematically selected and fulfilled the inclusion criteria.

Inclusion criteria

Those cards of obstetric care women received care in Debre Markos Referral Hospital from April 1, 2015 to March 30, 2017 were reviewed.

Exclusion criteria

Incomplete records were excluded from the study.

Sample size determination and sampling procedure

The sample size determination was determined by using the assumption of confidence level = 95%, critical value Z = 1.96 (from significance level α = 5%) and degree of precision = 0.03. By taking (9.5%) from previous study [1] with single population proportion formula.

n = [(zá/2)2*p (1–p) *(D)]/d2 = [(1.96)2(0.095) (0.905)]/(0.03)2 = 367+ (367X0.1) = 403

So, the total sample size was determined to be 367, by taking 10% none response rate (incomplete cards), then it become 403.

By using systematic random sampling technique, first we determined kth value by dividing sampling unit of the source population (10200) to the final sample size (403). The first sample was selected by lottery method.

I.e. K=10200/403 = 25

Every 25 client cards were selected to have a total sample size of 403.

The source population was 10,200 and we included all postpartum women delivered in Debre Markos referral hospital in the period of 2015 to 2017 in our study.

Data collection tool

Data were collected using structured checklist from delivery registers, operating registers and patients' case file. The check list was adapted from the result of different literatures [9-12] and developed by English reviewing various literatures.

Data quality control

Pre-test was conducted 5% of the total sample size in DMRH and necessary correction was employed accordingly. Data collection was done by five trained health professionals and one supervisor after one day intensive training has been given.

Data processing and analysis

Data were checked for completeness and consistency and entered in to Epi-Data version 3.1 and then exported to SPSS version 23 for analysis. First descriptive analysis was carried out to determine the magnitude of uterine rapture. Next Bivariate logistic regression was performed for each independent variable with the

outcome of interest. P < 0.05 was considered statistically significant. Finally, multiple logistic regression analysis was conducted to determine the independent predictors of uterine rapture.

Ethical consideration

The study was conducted after securing approval of proposal by Debre Markos University, medicine and health sciences college ethical review committee. Written permission was obtained from DMRH. Formal letter was submitted to Debere Markos Referral Hospital and permission of the hospital was obtained from hospital administrative. Written permission letter was also received from concerned bodies in the study area.

Results

Socio-demographic characteristics

A total of 378 mothers were included in the study making a response rate of 94%. The ages of mothers who got uterine rupture ranged between 20-40 years, the mean age of the respondents was 27.18 years with SD ± 5.4 and 92.1% of the study participants were in the age group between 19 to 35 years followed by ≥35years were 6.3%. Among total cases, 10(2.6%), 362(95.8%), 6(1.6%) were never married, married and divorced respectively. The distribution of residence, 213 (56.3%) were urban.

Obstetric characteristics

Based on our finding, those mothers who got uterine rupture 1 (3%) were primi-para; 18 (54.5%) of the patients were para II-IV, and 14 (42.5%) were para V and above. From mothers those who got uterine rupture 29 (87.9%) had at least one ANC and the remaining 4 (12.1%) had no any ANC follow up. Of these uterine rupture 14(69.9%) delayed at home, 6(26.1%) lack of transportation, 3(13%) at referral. Among ruptured cases, 24 (72.7%) were not followed with partograph throughout the course of labour. Of total cases, 52(13.8%) were diagnosed as cephalopelvic disproportion; of those 19(57.6%) were ruptured uterus, 325 (86%), 19 (57.6%) were vertex in presentation and ruptured cases respectively, and also 18 (4.8%) and 9(27.2%) were face in presentation and ruptured cases respectively. There were 100(26.5%) induced or augmented among, 6 (18.2%) were with uterine rupture (Table 1).

Magnitude of uterine rupture

The overall magnitude of uterine rupture among mothers who gave birth in Debre Markos referral hospitals was found to be 33(8.7%). There was no maternal death found in this study. The commonest cause of uterine rupture was obstructed labour accounted 13(39.5%). Most of the cases 29 (87.8%) were with complete uterine rupture. Among uterine rapture cases, the most common complication was blood loss which accounts 29(87.8), followed by vesicovagenal fistula 4(12.2%). In this study, the commonest cause of uterine rupture was obstructed labour which account 13(39.9%), flowed by VBAC trial 7 (21.2%) (Figure 1).

Obstetrics Profile	Uterine rupture Frequency	Uterine rupture Percentage
Residence		
Urban	14	42.4
Rural	19	57.6
Duration of Labor		
<24hrs	10	30.3
>=24hrs	23	69.7
Obstructed labor		
Yes	22	66.7
No	11	33.3
CPD		
Yes	19	57.6
No	14	42.4
Previous delivery		
Yes	32	97
No	1	3
VBAC		
Yes	7	21.2
No	26	78.9

Table 1: Obstetrics characteristics of uterine rupture patients among mothers in Debre Markos referral hospitals 2018(n = 403).

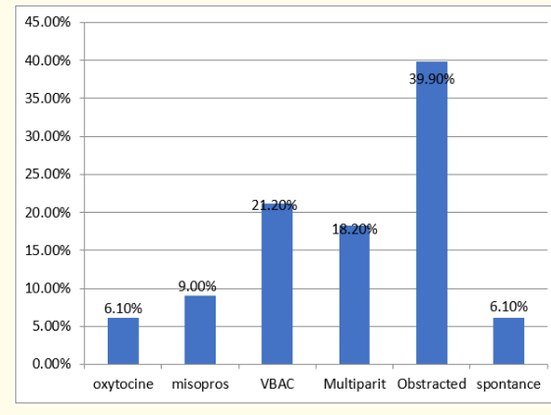

Figure 1: Shows that cause of uterine rupture in Debre Markos Referral Hospital from 2015 to 2017.

Factors associated with uterine rupture

The result of this study on binary logistic regression analysis revealed that the age of the respondents' ≥35 years, mothers who came rural area. Mothers who had para II-IV and ≥ para V, labour ≥ 24 hours, mothers having previous delivery history, those who were diagnosed with obstructed labour, those who were not followed with partograph during the course of labour and mothers diagnosed with cephalo-pelvic disproportion had significant associations with uterine rupture (p-value < 0.2).

In multiple logistic regression analysis, those who didn't follow by partograph and those who had obstructed labour had significant association with uterine rupture. Among mothers who were not followed by partograph had 6.54 odd of uterine rupture than those who were followed by partograph. [AOR = 6.54; 95%CI: 1.99 - 21.52; p = 0.002]. And also among mothers who had obstructed labour had 0.04 odd of uterine rupture than those who had no obstructed labour [AOR = 0.04; 95%CI = 0.02 - 0.10, p = 0.0001]

Variables	Uterine rapture		COR(95%CI)	AOR(95%CI)	P - value
	Yes	No			
Residence					
Urban	14	199			
Rural	19	149	1.85(0.898 - 3.81)	1.560(0.631 - 3.852	0.335
Distance					
≥10km	27	221	0.396(0.159 - 0.985)	1.204(0.328 - 4.417)	0.779
<10km	6	124			
Age					
≤18yrs	0	6			
18 - 35yrs	28	320		10647785.292(0.000)	
≥35yrs	5	19	3.008,95%CI:1.044 - 8.665	1.033(0.249 - 4.287)	0.965
Parity					
Para I	1	103			
Para II - IV	18	170	20.028,95%CI:2.576 - 155.726	7.331(0.847 - 63.434)	0.070
	14	74	1.867,95%CI:0.867 - 3.891	1.235(0.481 - 3.169)	0.661
Para V and above					
Duration of labor					
<24hrs	23	272	10.925,95%CI:4.944 - 24.142	2.800(0.994 - 7.884)	0.051
≥24hrs	10	73			
Previous delivery					
Yes	32	254	0.077%CI:0.010 - 0.568	0.658(0.030 - 14.200)	0.789
No	1	92			
Obstructed labor					
Yes	22	28	0.044,95%CI=0.019 - 0.100	0.286(0.093 - 0.874)	0.028*
No	11	317			
Parthograph					
Yes	9	306			
No	24	39	20.923,95%CI:9.074 - 48.24	6.756(2.390 - 19.096)	0.0001*
CPD					
Yes	19	33	0.078,95%CI:0.036 - 0.170	0.889(0.246 - 3.216	0.858
No	14	312			

Table 2: Bivariable and multivariable logistic regression analysis result of uterine rupture in Debre Markos referral hospital, 2018(n = 403).

NB **Indicates significant at *P* < 0.05. COR: Crude Odd Ration and AOR: Adjusted Odds Ratio.

Discussion

This study aimed to determine the magnitude of uterine rapture and associated factors among women managed for obstetric care. In our study the magnitude of uterine rupture is 8.7% which tells us the magnitude is high in Debre Markos referral hospital compared to other studies conducted in Ethiopia and abroad. We can compare and contrast our finding with different studies globally, nationally and locally. It is higher when compared with that of a study done at Central Africa (1.9%), new York (0.88%) but lower than study done Burkina Faso (18%) [8]. The difference might be differences in delivery service coverage, accessibility of the facilities, availability of skilled personnel and medical supplies, delay at

home, lack of transportation, socio-demographic variation and low antenatal care service utilization in the study area.

In this study among uterine rapture cases, 4 (12.2%) were developed vesical and vaginal fistula. This finding is higher than the finding in Ghana 2 (4.9%) [14],Suhul General Hospital shire (9.8%) [13], rural Uganda 2(3%) [5]. This differences might be explained by due to the high occurrence of obstructed and prolonged labour that leads to prolonged compression of the bladder for prolonged time ischemia and necrosis end up with abnormal epithelial communication in this study. But, it is in line with the finding from Adigrat (12.5%) [8]. Among total uterine rupture cases misoprostol and oxytocin contributes about (9%) and (6.1%) respectively; which is higher than Ghana 2.4% [14]. The possible explanation might be due to widely use of misoprostol for cervical ripening, induction of post term pregnancy, term premature rupture of membrane pe-eclampsica/eclampscia and the like also might be professional negligence for proper dosing or strictly follow up.

Inter-pregnancy interval among mothers with history of pervious caesarean section scar 2 (12.2%) were got pregnant less than 18 months from previous caesarean delivery, 20(36.6%) were got pregnant 18months-24month and 28(50.7%) were ≥24 month of these 1(3%), 2(12.1%), 4(21.2%) were less than 18 month, 18 -24 month, > 24 months had uterine rupture respectively, which is different from study done in Canada 188 (10.6%) had an interval of less than 18 months, 257 (14.5%) had an interval between 18 and 24 months, and (74.8%) had an inter-delivery interval of 24 months or longer [11]. The difference might be explained by increased awareness of postpone of pregnancy after caesarean delivery, close follow up of ANC, variation the level of health care set up.

Among factors associated with uterine rapture, those who didn't follow by partograph had significant association with uterine rupture. Among mothers who were not followed by partograph had higher odd of uterine rupture than those who were followed by partograph. These may be mothers labouring at home due to different reasons like lack of transportation, no ANC follow up or poor ANC counselling, or negligence of health professionals. According to WHO, partograph is one of the tool which shows patient information, fetal condition, progress of labour and maternal condition. Also it serves as an "early warning system" and assists in early decision to transfer, augmentation and termination of labour.

Strength and Limitation of the Study

Strength

During our data abstraction, we tried to refine the data from the three data sources to prevent double recording of the client.

Limitation of the Study

Because of lack of standard format about what variables should be documented in every maternal card, some relevant variables were not registered in the clients' document.

Since the study was an institution based cross sectional study, the results of the study may not show the true picture of the problem in the community.

Conclusion

The magnitude of uterine rupture is high in Debre Markos referral hospital. Those mothers who were not followed by partograph and had obstructed labour were significantly associated with uterine rupture.

Recommendations

Debre Markos referral hospital and nearby health facilities:

- It is better to follow labor with partograph in the hospital.
- It is better to create awareness in the community and nearby health institutions to prevent obstructed labour.

Media

It is necessary to create awareness in the community about the prevention of obstructed labour and its consequences.

Researchers

Further study is needed both institutional and community based with cohort study design to get all socio-demographic and other variables in the hospital.

Data Availability

Data used for this study are available from the authors upon request.

Conflicts of Interest

The authors declare that they have no competing interests

Author's Contribution

Asmare Talie and Mekuanint Taddele were participated in proposal writing, analyzing the data, and drafting the paper. Melese Teketelew, Asmare Talie Melaku Admas prepared the manuscript for publication. All authors read and approved the manuscript.

Funding

This research was funded by Debre Markos University College of health sciences up to data collection and analysis of the result but writing the manuscript was fully covered by the authors themselves.

Acknowledgement

We would like to express my heartfelt gratitude to Debre Markos University for financial support for the completion of this research paper. We would like to extend our heartfelt thanks to De-

bre Markos referral hospital chart registration room staffs for their support in the data collection process. We would also like to thank data facilitators for their unreserved and dedicated cooperation.

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