



Full Length Research Paper

Analysis of Risk factors for Maternal Death and Delivery Complications' in West Shoa Zone, Oromia Region, Ethiopia: A Retrospective Study

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Abstract

Maternal death is the main health problem of developing countries. In complement to the millennium development goals to reduce the maternal mortality ratio by three-quarters between 1990 and 2015, the determinant risk factors were identified at community level for the case of Ethiopia. The risk factors and prevalence of maternal death to the observed complication during operative deliveries has been determined with a retrospective study design in Ambo Hospital, West Shoa Zone, Oromia region and its peripheral areas for the year of 2006 by taking all operative delivery cases recorded in that year. Totally, 227 complications have been recorded, and the prevalence of maternal death is found to be 4.4% (44 deaths for every 1000 operative deliveries or complications). Out of all mothers with operative deliveries, 11.9% has attended antenatal care, 3.1% have performed abortion at least one time. The fetus health condition has also been analyzed using apgar score method, and 44.4% were found to be in good health condition followed by 31.7% with so bad health condition. The risk factors, obstructed labor accounts for 27.5%, APH and PPH together accounts for 18%, uterine rupture (UR) accounts for 15.8%, and mal-presentation accounts for 14.9%, are the main factors causing delivery complications. However, uterine rupture (UR) followed by PPH and obstructed labor are the major causal risks of maternal death. Therefore, strategies have to be devised to reduce maternal mortality by giving more attention to the most death causing risk factors in the area.

Keywords: Maternal death, Risk factors, Retrospective

Acronyms

AMDD: Averting Maternal Death and Disability; **DHS:** Demographic Health Survey; **EDHS:** Ethiopian Demographic Health Survey; **UNFPA:** United Nations Fund program; **UNICEF:** United Nations International Child Education Fund; **WHO:** World Health Organization

Introduction

Each year, more than 500,000 women die from complications in pregnancy and childbirth, even though the means exist to save the vast majority. Millions more are disabled. The AMDD Program was established in 1999 to work with developing countries and international agencies to improve availability, quality and utilization of emergency obstetric care (Koblinsky, MA., 1995). The geographic distribution of the hundreds of thousands of maternal deaths each year is telling: 99% of deaths in childbirth are in the developing world. Such disparity is mirrored within countries where poor women are more likely to die or become disabled than those with means. Many deaths, of women and their newborns, can be prevented with emergency obstetric care delivered through well-functioning health systems. Maternal and newborn death and disability are personal tragedies, symptoms of health systems in crisis, and profound violations of human rights (WHO and UNICEF, *et al*, 2003).

Since the launch of the Safe Motherhood Initiative in 1987, attention to reproductive health has increased worldwide, as has the need for reliable countrywide estimates of maternal deaths. In response to this increased interest, DHS surveys began collecting maternal mortality data through a series of questions designed to obtain a direct measure of maternal mortality. These questions were included in the 2005 EDHS; the second time such information was collected in Ethiopia, the first time was in the 2000 EDHS. In addition to information on maternal mortality, data gathered from the maternal mortality module also allow for the estimation of adult mortality (<http://www.amdprogram.org>, 2009).

Although the estimates has shown that maternal mortality may be declining in Ethiopia, the study underwent in the last years was not incorporating the assessment of the risk factors and was also subjected to a high degree of sampling error. Moreover, the study in the 2000 and 2005 EDHS has assessed only the prevalence of maternal deaths. The Result has shown that the maternal mortality ratio for Ethiopia for the period 1998-2004 is 673 deaths per 100,000 live births (or alternatively 7 deaths per 1,000 live births). Similarly collected data from the 2000 EDHS has shown the maternal mortality ratio for Ethiopia for the period 1994-2000 to be 871 deaths per 100,000 live births or 9 deaths per 1,000 live births.

Therefore, a thorough study should be done with appropriate sample design in order to identify the significant risk factors contributing to pregnancy complication, then to the maternal mortality. This study was aimed to assess determinants of pregnancy complication related maternal death in a rural settings in the region of Oromia, West Shoa Zone by taking all women who undertook operative delivery or cesarean section for the year 2006 (1998 E.C), one year later than the second EDHS. Besides, it provides a community-based estimate of the level of maternal mortality as a result of delivery complication together with the infant’s health situation.

Methodology

Description of study area

A retrospective study was carried out in Oromia region, West Shoa zone, Ambo Hospital. All mothers delivered with operation or cesarean section at Ambo Hospital in the year 2006 (1998 E.C) was included in the study. Totally, 227 delivery complications have been reviewed from the hospital obstetric record. The response variable is the status of mother (died or not died) and socio-demographic and risk factors were considered to be the explanatory variables.

The descriptive analysis, estimation and tests of association were performed using SPSS statistical program. Estimation of prevalence rate was made and identification of the most significant factors were performed. Chi-square tests of pairwise associations have also been employed.

Description of the variables

Code	Description
CPD	Cephalopelvic Disproportion
APH	Ante-partum Haemorrhage- bleeding during pregnancy
PPH	Post-partum Haemorrhage – bleeding after delivery
Eclampsia	Hypertension disorder
Induction	use of medication to bring on labor
FD	disorder of sensory nervous system
IUFD	Intra-utrine fetal death
OL	Obstructed labor (when the presenting part of the fetus cannot progress in to the birth canal despite strong utrine constructions)
poorl	Poor labor
malpres	Malpresentation (brow, shoulder, hand, breech, face etc.)
faildI	Failed induction
cordp	Cord prolapse
prevcs	Previous cesarean

Results and Discussion

Descriptive Analysis

Various potential risk factors such as cephalopelvic disproportion (CPD), ante-partum Haemorrhage (APH), eclampsia, induction, FD, IUFD, obstructed Labor (OL), and post-partum Haemorrhage (PPH) are included in the study. The result presented in the figure 1 shows that obstructed labor (27.48%) is the most occurring causes of complication followed by uterine rapture (15.77%), malpresentation (14.36%) and APH (12.61%) in this order. The CPD and PPH are also significant risk factors for delivery complication.

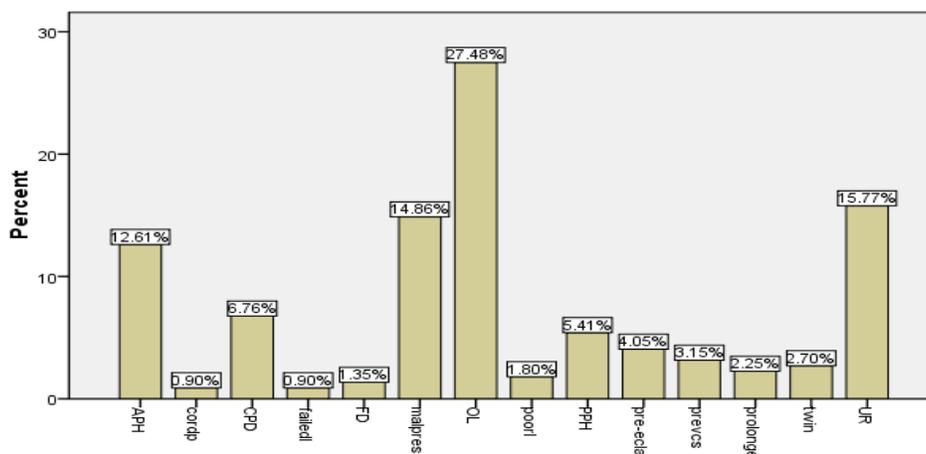


Figure 1. Risk factors chart

From the Antenatal care (ANC) attendees and non-attendees are assessment shown in table 1 below, only 11.9% has attended ANC while the rest 88.1% are non-attendees. This shows that eight fold percents of mothers do not come to obtain antenatal care services due to less awareness about the importance of the service and/ or the shortage in antenatal care services in the study area. Therefore, provision of health services in antenatal care might workout in the reduction of delivery complications.

Table 1: Antenatal care attendance of the mother

		Frequency	Percent	Cumulative Percent
Valid	No	200	88.1	88.1
	Yes	27	11.9	100.0
	Total	227	100.0	

As shown in the Table 2 below, the abortion status of the mothers has also been assessed. Result shows that 3.1% of the mothers have made abortion at least one time. However, though the percent of abortion is less as shown, the more cycle of doing abortion would contribute to delivery complications. Thus, reducing abortion even to lesser percent could relief the mothers from delivery complications.

Table 2. Abortion Status of the mother

		Frequency	Percent	Cumulative Percent
Valid	No	220	96.9	96.9
	Yes	7	3.1	100.0
	Total	227	100.0	

As a result of complications during delivery, 4.4 % of the mothers have expired in the study year 2006. This implies that 44 mothers die for every 1000 complicate deliveries. Therefore, enhancing the health care during pregnancy would reduce complications and which in turn reduces maternity (Table 3).

Table 3. Mortality status of the mothers

		Frequency	Percent	Cumulative Percent
Valid	No	217	95.6	95.6
	Yes	10	4.4	100.0
	Total	227	100.0	

Chi-square Tests of Association

Table 4: Association of Status of the mother and the risk factors			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	30.204 ^a	13	.004
Likelihood Ratio	25.498	13	.020
N of Valid Cases	222		

The status of the mothers has statistically significant association with the risk factors, ($\chi^2 = 30.204$, $df= 13$ and $p=0.004 < 0.05$). This implies that the risks factors are the causal factors of maternal death.

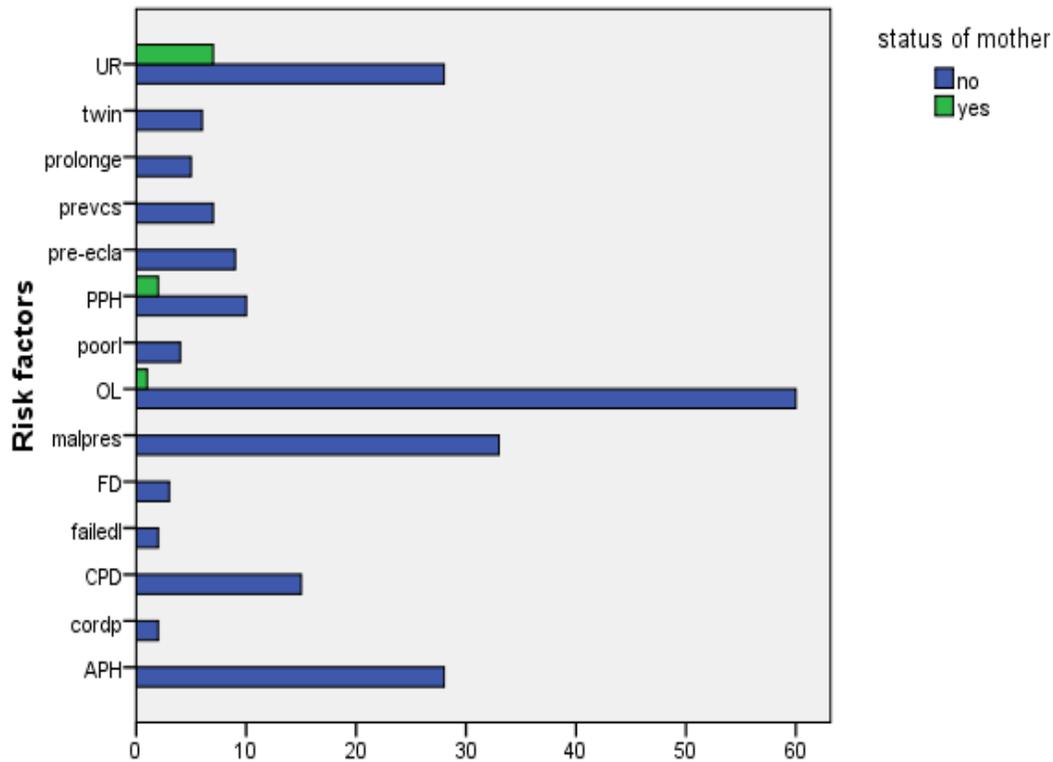


Figure 2. Risk factors test of association

In the Figure 2 above, the results reveals that uterine rapture, PPH and obstructed labor are the most causal factors of maternal death. The major risk factors contributing to the maternal death are listed as UR, PPH, OL and GMP in order of their level of influences.

Conclusion and Recommendation

The major findings of this study is that, obstructed labor is the most cause of delivery complications followed by APH and PPH together and the mal-presentation and uterine rapture are also the subsequent risk factors. But, uterine rupture is the prominent risk factor that causes more death of mothers followed by PPH and obstructed labor. Moreover, few numbers of mothers are attended antenatal care in the study area. Therefore, strategies have to be devised to reduce maternal death by giving more attention to the most determinant risk factors. Also more have to be done in reducing the risk factors and in initiating antenatal care attendance in order to achieve the ultimate goals of improving the health of mothers and reducing the maternal mortality.

References

Agresti, A.(1996). An Introduction to categorical Analysis, John Wiley and Sons, Inc., New York
 Daniel, W.W, 1991. Biostatistics: A foundation for analysis in the health sciences, 5th ed. John Willy & Sons , New York
Demographic and health indicators for countries of the Eastern Mediterranean, 1996. Alexandria, World Health Organization Regional Office for the Eastern Mediterranean, 1997.
 Downe, S (1991). The price of motherhood. *Nursing times*, 87(10):33-5.
 Ethiopia Demographic and Health Survey report (EDHS, 2005).
<http://www.amddprogram.org/index.php>: 30/10/2009
 Koblinsky MA. Beyond maternal mortality — magnitude, interrelationship, and consequences of women's health, pregnancy-related complications and nutritional status on pregnancy outcomes. *International journal of gynecology and obstetrics*, 1995, 48(suppl.):S21-32.
Report of an intercountry workshop on follow-up achievements of the Safe Motherhood Initiative in the Eastern Mediterranean Region, Sana'a, Republic of Yemen, 3-6 May 1998. Alexandria, World Health Organization Regional Office for the Eastern Mediterranean, 1998.
The safe motherhood action agenda: priorities for the next decade. New York, Family Care International in collaboration with the Interagency Group for Safe Motherhood, 1997.
 UNFPA and AMDD, *Reducing Maternal Deaths: Selecting Priorities, Tracking Progress*, Distance Learning Courses on Population Issues, Turin, UN System Staff College, 2002.
 WHO, UNICEF, UNFPA. *Maternal Mortality in 2000: Estimates Developed by WHO, UNICEF and UNFPA.* Geneva: WHO, 2003.