Diseases Related to Maternal Mortality in Wad Medani Obstetrics and Gynecology Teaching Hospital, Sudan (2011-2014)

Samira Mohammed Abdalla [1]
.Isam Omer Fadol [2]

ABSTRACT

Worldwide an estimated 529,000 girl and woman die of pregnancy related causes each year about one every minute and many time that number suffer long term injuries and disabilities. 99% of all maternal death occurs in the developing world (WHO 2005). In Sudan many women's dies due to pregnancy related complications, and those who survive suffer from sever maternal morbidity.

This study aimed to explore the most common diseases related to maternal mortality in Sudan with references to Wad Medani Obstetrics and Gynecology Teaching Hospital during the period (2011-2014).

The study used data collected from Wad Medani obstetrics and Gynecology Teaching Hospital annual reports for which data were completed and available include 245 cases. For data analysis the study used descriptive analytical methodology and Chi-square test.

The result revealed that the indirect causes of maternal deaths responsible of 69.7% including, malaria, cancer, heart diseases, liver diseases and jaundice. While the direct cusses represent 30.3 of maternal death and this include Hemorrhage, bleeding poisoning, abortion and eclampsia.

The study recommended that raising the awareness of women with the importance of follow up visit during pregnancy and after delivery. Also the study recommended that working to sustain malaria fighting program and intensify the effort in this regard.

[1] Assistant professor, Department of Rural Development, Faculty of Economics and Rural Development .

[2] Assistant professor, Department of Applied Statistics and Demography, Faculty of Economics and Rural Development.

الأمراض التي تؤدى إلى وفيات الأمهات في مستشفى ود مدني التعليمي للنساء والتوليد, السودان (2011-2014)

تشير التقديرات العالمية إلى موت 529 امرأة لأسباب تتعلق بالحمل والولادة كل سنة. وتعانى امرأة واحدة أو أكثر كل دقيقة من مضاعفات العمليات الجراحية بعد الولادة. 99% من وفيات الأمهات تحدث في دول العالم الثالث. في السودان هناك عديد من النساء اللاتي يمتن نتيجة مضاعفات الحمل والولادة بينما تعاني الباقيات على قيد الحياة من أمراض الأمومة. هدفت هذه الدراسة إلى توضيح أكثر الأمراض شيوعا والتي تؤدى إلى وفيات الأمهات في السودان بالرجوع إلى مستشفى ود مدني للنساء والتوليد خلال الفترة (2011-2014). اعتمدت الدراسة على بيانات ثانوية تم الحصول عليها من التقارير السنوية من مستشفى ود مدني للنساء والتوليد المتوفرة ومكتملة البيانات وكانت 245 حالة. لتحليل البيانات استخدمت الدراسة المنهج الوصفي التحليلي واختبار مربع كأي. أوضحت الدراسة أن الأسباب غير المباشرة لوفيات الأمهات تمثل 69.7% من أسباب وفيات الأمهات تشمل الملا ريا، السرطان, أمراض القلب, أمراض الكبد واليرقان في حين أن الأسباب المباشرة لوفيات الأمهات مسئولة عن 30.3% من أسباب وفيات الأمهات وهى تشمل النزيف, تسمم الدم, الإجهاض والكلبشة. أوصت الدراسة بزيادة وعي النساء بأهمية المتابعة أثناء الحمل وبعد الولادة. كذلك أوصت الدراسة بالعمل على الاستمرار في برنامج مكافحة الملا ريا وتكثيف الجهود في ذلك.

INTRODUCTION

Maternal mortality Ratio (MMR) is defined as "the ratio of the number of maternal death during a given period per 100,000 live births during the same time period ". The global MMR is 210 per 100,000 live births. Despite worldwide decline since 1990, the MMR is 15 times higher in developing countries than developed one, sub-Saharan Africa has the highest MMR estimated at 500 per 100,000 live births. In developed region the (MMR) is 16 per 100,000 live births (UNDP, 2010).

In Arab region maternal mortality continues to be one of the major concerns in the region. Despite the remarkable achievements in reducing maternal mortality rate in some countries, women in other countries suffer from high health risk during pregnancy, delivering and infancy. The inclusion of maternal mortality in the millennium development goals has heightened the awareness of government to the need to provide appropriate reproductive health services. Reduction of maternal mortality can be achieved through timely access to high quality prenatal care delivery and postnatal care, and management of pregnancy with complications and emergency obstetric care (UNDP, 2010).

The target for millennium development goal five is to reduce the global (MMR) by three quarters and to achieve universal access to reproductive health by 2015. In Sudan the (MMR) was 720 per 100,000 live birth in 1990, 640 in 1995, 540 in 2000, 460 in 2008 and 360 per 100,000 in 2013 resulting in progress made towards achieving MDG five.

The ultimate objective of this study is explore the most common diseases related to maternal mortality in Sudan with references to Wad Mandeni Maternity obstetrics and Gynecology Teaching Hospital.

The importance of the study stem from the fact that the reduction of maternal death require deep understanding of diseases related to maternal death, in order to produce decision that could play important role in reducing maternal death and achieving MDG five .

The study used secondary data collected from Mandeni Maternity obstetrics and Gynecology Teaching Hospital Annual reports for which data were completed and available. For data analysis, the study used descriptive analytical methodology and Chi-square test.

The result reveal that the direct causes of maternal death responsible 69.7% including, malaria, cancer, heart diseases, liver diseases and jaundice. While the indirect cusses represent 30.3 of maternal death and this include Hemorrhage, bleeding poisoning, abortion and eclamsia.

The remainder of the paper is organized as follows: Section (2) reviews literature and gives a background about diseases related to maternal mortality. Section (3) discusses the empirical results and finally, some concluding remarks and recommendation are reported in section (4).

Maternal death is defined as "the death of a women while pregnant or within 42 days of pregnancy, irrespective of the duration and the site of the pregnancy, from any cause related to aggravated by the pregnancy or its management but not from accidental or incidental causes

Worldwide an estimated 529,000 girl and woman die of pregnancy related causes each year about one every minute and many time that number suffer long term injuries and disabilities 99%of all maternal death occur in the developing world (WHO, 2005). In 2010 an estimated 287,000 maternal death occurs worldwide, most of which were in low income and middle incomes countries.

Direct obstetric deaths; those resulting from obstetric complications of the pregnant state (pregnancy, labour and puerperium), from interventions, omissions, incorrect treatment.‘‘ Indirect obstetric deaths; those resulting from previous existing disease or disease that

developed during pregnancy and which was not due to direct obstetric causes, but which was aggravated by physiologic effects.

For every maternal death there are about 20 cases with complications ranging from choking diseases to illness leading to disability such as fistula. Countries with high level of maternal mortality are faced with the need to improve health system and ensure accessibility to quality reproductive health services (Who, 2009).

The burden of death due to these condition is greater in low – income and middle income countries and if current trend continue , death from such situation is projected to raised many times by 2030 (UNDP, 2010).

Diseases Related to Maternal Death

Nearly 73% of all maternal deaths between 2003 and 2009 were due to direct obstetric causes whereas deaths due to indirect causes accounted for 27.5%, (95%) of all deaths from known causes. Hemorrhage was the leading direct cause of maternal death worldwide, representing 27.1% of maternal deaths. More than two thirds of reported hemorrhage deaths were classified as postpartum hemorrhage. Hypertension was the second most common direct cause worldwide (14.0%,). Maternal mortality due to sepsis was 10.7%, abortion accounted for 7.9% and embolism and other direct causes accounted for the remaining 12.8% of global deaths. The other direct causes of maternal mortality. Complications of delivery were responsible for 2.8% and obstructed labour for 2.8% of all maternal deaths worldwide, both reported within the other direct category, which accounted for 9.6% of all maternal deaths worldwide. Further breakdown of deaths due to indirect causes suggests that more than 70% of indirect causes are from pre-existing disorders, including HIV, when exacerbated by pregnancy (HIV) alone accounted for 5.5% of global maternal deaths(WHO, 2014).

DISCUSSION OF THE RESULT

Maternal mortality is one of the world's most neglected problems. Every day, around 1600 women die due to complications of pregnancy. Eighty percent of these deaths are largely preventable or treatable at little or no extra cost, even in resource-poor settings. In 2009, the maternal mortality ratio in Sudan was 440 per 100.000 live birth compared with 12 in Qatar, 15 in Saudi Arabia, 20 in Palestine, 86 in Lebanon and 366 in Yemen.

Wad Mandeni town is the second largest city in Sudan, with about (600,000) inhabitants (CBS, 2008). Wad Mandeni is surrounded by villages and rural areas where midwifes attend deliveries at home and complicated cases are referred to Wad Mandeni obstetrics and Gynecology Teaching Hospital.

DESCRIPTIVE ANALYSIS

To accomplish the research objectives, we firstly begin with providing some descriptive statistics as shown in the following tables:

Table (3.1.1) the Distribution of Cases According to Residence

Residence	Frequencies	percentage
Rural	138	55.5%
Urban	109	44,5%
Total	245	100.0

Source: Own Calculation Based on Wad Medani obstetrics and Gynecology Teaching Hospital Reports, 2014

Table (3.1.1) shows that 55.5% of the dead mothers were rural residents compare with 44.5% who were urban residents.

Table (3.1.2) the Distribution of Cases According to Reasons of Death

Reason of death	Frequencies	Reasons of death Percent
Hemorrhage(bleeding)	27	11.0
Cancer	30	12.2
Liver diseases	9	3.7
Malaria	6	2.4
Heart diseases	10	4.1
Jaundice	37	15.1
Abortion	3	1.2
Blood poisoning	30	12.2
Eclamsia	14	5.7
Others	79	32.2
Total	245	100.0

Source: Own Calculation Based on Wad Mandeni obstetrics and Gynecology Teaching Hospital Reports, 2014

From table (3.1.2) we can notice that direct causes are responsible for 30. 1% of all maternal deaths in Wad Mandeni hospital compared to 80% of maternal deaths worldwide.

In France, Direct obstetric causes largely dominate (73%), mostly hemorrhage (25%) and amniotic embolism (11%). The majority of maternal deaths in developing countries are caused by five major direct obstetric complications: hemorrhage, infection, unsafe abortion, hypertensive disorders of pregnancy and obstructed labor. Obstetrical hemorrhage represents 30% of all causes of maternal death, and hypertensive crises are the origin of another 15%. Callister (2005) established that the most frequent direct causes of global maternal deaths were hemorrhage, infection, unsafe abortion, pregnancy-induced hypertension, and obstructed labor.

In this investigation, we found that postpartum hemorrhage is one of the important causes of maternal mortality, responsible for 11.0 % of all deaths. This coincided with the finding of Khanetal who reported that hemorrhage was the leading cause of death in Africa (33.9%) and in Asia 30.8%. In addition, several studies also confirmed that postpartum hemorrhage is the most important single cause of maternal death, with 88% of deaths from hemorrhage occurring within four hours of giving birth. It has been estimated that approximately 25% of maternal deaths are caused by hemorrhage, 15% by infection, and 13% by unsafe abortion, 12% by

pregnancy-induced hypertension, 8% by obstructed labor and 8% by other direct causes. While Twenty percent are ascribed to indirect causes, including malaria and iron deficiency anemia. Also the present study shows that 69.7% of maternal death are due to indirect causes, including malaria (2.4%), cancer (12.2%), heart diseases (4.1%), liver diseases (3.7%) and jaundice (15.1%).

Eclampsia is one of the top five maternal and infant illnesses and death, causing an estimated 13% of all maternal death worldwide. The present study indicates that 5.7% of maternal deaths were due to eclampsia. Study conduct in the some hospital in 2013 indicates that there were 1765 women with pre-eclampsia in the hospital giving incident of pre-eclampsia 3.2%. Murray and Lopez stated that pre- eclampsia and eclampsia remain two of the most common reasons for women dying during pregnancy worldwide, as 12% of all maternal deaths are caused by eclampsia. Pre- eclampsia and eclampsia probably account for more than 50,000 maternal deaths worldwide each year. In Gharbyia that hypertensive diseases complicating pregnancy (pre-eclampsia and eclampsia) accounted for 19.05% of all maternal deaths. This is in agreement with the results of studies done in Colombia, where up to 42% of maternal deaths are from pre-eclampsia or eclampsia. (Adam *et al*, 2013).

Liver failure, heart disease and renal disease each constituted 4.76% of total maternal deaths in Tanta University Hospital in Egypt. In Malaysia, 2.15% of maternal deaths were caused by liver disease. Our present study found that 9% of maternal death due to liver failure, while heart diseases responsible for 10% of maternal death.

The term ‘abortion’ covers a variety of conditions arising during early pregnancy, from ectopic pregnancy and hydatid form mole, through to spontaneous and induced abortion. There are important differences in the dimensions and nature of deaths and disabilities resulting from different kinds of abortion. The overwhelming majority of deaths and disabilities caused by pregnancies with abortive outcome arise from the complications of unsafe abortion, defined as an abortion taking place out with a health facility (or other place recognized by law) and or provided by an unskilled person. Unsafe abortion may lead to hemorrhage, infection and death. In WHO reports, estimated a global incidence of unsafe abortion of over 14 unsafe abortions for every 100 live births, amounting to 68,000 abortion-related maternal deaths each year. Abortion is responsible for 1.2% of maternal death in Wad Mandeni hospital in Sudan. While blood poisoning responsible for 12.2 % of maternal death in Wad Medani hospital.

Table (3.1.3) the Distribution of Cases According to Age Classification

Age Classification	Frequency	Percentage
15-19	13	5.3
20-24	34	13.9
25-29	59	24.1
30-34	60	24.5
35-39	36	14.7
40-44	14	5.7
45-49	5	2.0
50+	24	9.8
Total	245	100.0

Source: Own Calculation Based on Wad Mandeni obstetrics and Gynecology Teaching Hospital Reports, 2014

Table (3.1.3) above illustrate that 24.5% of dead mothers were in reproductive aged (30-34) followed by 24.1% for those aged (25-29) years, so maternal deaths were concentrated on the middle of the reproductive span. Although those mothers at early and late age of reproductive span were most likely to be exposed to the risk of maternal mortality.

Cross Tabulation

Table (3.2.1) Chi. Squared Test for Association between Reasons of Death and Type of Residents

Value of ^{2}	df	P. value
5.345	9	0.803

Source: Own Calculation Based on Wad Mandeni obstetrics and Gynecology Teaching Hospital Reports, 2014

The result of x^2 test above reveal that the P.value is greater than (0.05), so there was no significant association between the reason of mother death and the type of residence of mothers.

Table (3.2.1)Chi Squared Test for Association Between Reasons of Death and Type of Residents

Reasons of death	Residence		
	Rural	Urban	Total
Bleeding	15	12	27
	55.6%	44.4%	100.0%
Cancer	17	13	30
	56.7%	43.3%	100.0%
Liver diseases	6	3	9
	66.7%	33.3%	100.0%
Malaria	3	3	6
	50.0%	50.0%	100.0%
Heart diseases	4	6	10
	40.0%	60.0%	100.0%
Jaundice	22	15	37
	59.5%	40.5%	100.0%
Abortion	3	0	3
	100.0%	0%	100.0%
Blood poisoning	14	16	30
	46.7%	53.3%	100.0%
Eclamsia	7	7	14
	50.0%	50.0%	100.0%
Other	45	34	79
	57.0%	43.0%	100.0%
Total	136	109	245
	55.5%	44.5%	100.0%

Source : Own Calculation Based on Wad Madeni Maternity Hospital Report ,201

Table (3.2.2) Chi. Squared Test for Association Between Reasons of Death and age of women

Value ^{2}	df	P. value
16.271	63	0.000

Source: Own Calculation Based on Wad Mandeni obstetrics and Gynecology Teaching Hospital Reports, 2014

The P. value of the ^{2}test above suggests highly significant association between reasons of death and age of mothers. The cross tabulation between the two variables shows that jaundice was highly spread among young mothers, while cancer was found to be highly spread among old mothers.

Squared Test for Association Between Reasons of Death and women age group

Reasons of Death	Age class								
	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50+	Total
Bleeding	1 3.7%	1 3.7%	4 14.8%	11 40.7%	8 29.6?%	1 3.7%	1 3.7%	0 0%	27 100.0%
Cancer	0 0%	0 0%	1 3.3%	5 16.7%	4 13.3%	2 6.7%	1 3.3%	17 56.7%	30 100.0%
Liver diseases	0 0%	2 22.2%	3 33.3%	2 22.2%	1 11.1%	0 0%	0 0%	1 11.1%	9 100.0%
Malaria	0 0%	1 16.7%	1 16.7%	1 16.7%	2 33.3%	1 16.7 %	0 0%	0 0%	6 100.0%
Heart diseases	2 20.0 %	0 0%	3 30.0%	3 30.0%	0 0%	1 10.0 %	0 0%	1 10.0%	10 100.0%
Jaundice	6 16.2 %	7 18.9%	16 43.2%	6 43.2%	1 2.7%	0 0%	1 2.7%	0 0%	37 100.0%
Abortion	0 0%	0 0%	2 66.7%	0 0%	0 0%	1	0 0%	0 0%	3 100.0%
Blood poisoning	0 0%	7 23.3%	7 23.3%	8 26.7%	3 10.0%	4 13.3 %	1 3.3%	0 0%	30 100.0%
Eclamsia	0 0%	3 21.4%	6 42.9%	1 7.1%	4 28.6%	0 0%	0 0%	0 0%	14 100.0%
Others	4 5.1%	13 16.5%	16 20.3%	23 29.1%	13 16.5%	4 5.1%	1 1.3%	5 6.3%	79 100.0%
Total	13 5.3%	34 13.9%	59 24.1%	60 24.5%	36 14.7%	14 5.7%	5 2.0%	24 9.8%	245 100.0%

Source : Own Calculation Based on Wad Madeni Maternity Hospital Report ,2014

Some Concluding Remarks and Recommendations

As we discussed earlier the objective of this study is to explore the diseases related to maternal mortality in Wad Mandeni Obstetrics and Gynecology Teaching Hospital during the period (2011-2014). For which data are completed and available. The study concluded that the direct causes of maternal death were responsible for 69.7% of deaths including, malaria, cancer, heart diseases, liver diseases and jaundice. While the indirect cusses represent 30.3 of maternal death and this include hemorrhage, bleeding poisoning, abortion and eclampsia. Also the study demonstrate that jaundice was highly spread among young mothers, while cancer was found to be highly spread among old mothers .maternal deaths were concentrated on the middle of the reproductive span (25-39). Based on this result the study recommend that government should raise the awareness of women with the importance of follow up visit, increase the knowledge of risk indicator of likely complications during pregnancy, before and after delivery and working to sustain malaria fighting program and intensify the effort in this regard.

REFERENCES

1. Abdalla, A, 2011: maternal mortality in Kassala state –Eastern Sudan: community based study using reproductive age mortality survey.
2. Central Bureau of Statistics, Gezira State, Sudan, 2008
3. M.N.E-Gharib, 2010: causes of maternal deaths in Tanta University Hospital, Egypt. Published
4. UNCEIF, 2009: The State of The World's Children, Maternal and Newborn health.
5. UNDP, 2010: population Levels, Trends and Policies in the Arab Region. Challenges and Opportunities, Arab human development report
6. World Bank, 2005: Achieving the Millennium Development Goal of Improving Maternal Health: Determinants, Interventions and Challenges .worldbank.org
7. WHO,2014: Trends in Maternal Mortality 1990 to 2013 Estimates by WHO, UNICEF, UNFPA, The World Bank and the United Nations Population Division
8. WHO, 2013: guidance for measuring maternal mortality from a census