In Depth Analysis of Maternal Mortality in Ain Shams University Maternity Hospital in 2014-2017

Thesis

Submitted for Partial Fulfillment of Master Degree
in ***Gynecology and Obstetric***

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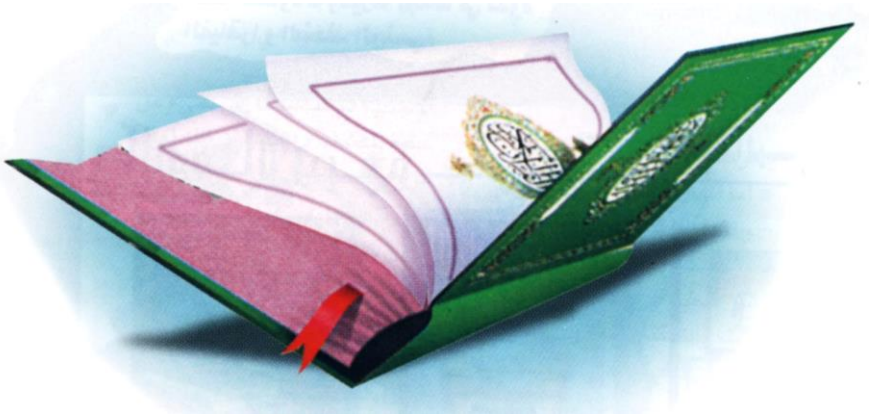
2019

بسم الله الرحمن الرحيم

وَقُلِ اعْمَلُوا فَسَيَرَى اللَّهُ
عَمَلَكُمْ وَرَسُولُهُ وَالْمُؤْمِنُونَ



صدق الله العظيم

[سورة: التوبة - الآية: ١٠٥]

Acknowledgments

First and foremost, I feel always indebted to ***Allah*** *the Most Beneficent and Merciful.*

I wish to express my deepest thanks, gratitude and appreciation to ***Prof. Dr. Adel Abd-AlAziz Hassouna****, Professor of Ophthalmology, Faculty of Medicine, Al-Azhar University, for his meticulous supervision, kind guidance, valuable instructions and generous help.*

Special thanks are due to ***Prof. Dr. Abdallah Hussein Hamed****, Professor of Ophthalmology, Faculty of Medicine, Al-Azhar University, for his sincere efforts, fruitful encouragement.*

I am deeply thankful to ***Prof. Dr. Mohammed Khedr Mohammed****, Professor of Ophthalmology, Faculty of Medicine, Al-Azhar University, for his great help, outstanding support, active participation and guidance.*

I would like to express my hearty thanks to all my family for their support till this work was completed.

Last but not least my sincere thanks and appreciation to all patients participated in this study.

Ahmed Mohammed Alkady

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List of Abbreviations

Abb.	Full term
ABG	*Arterial Blood Gas*
AFE	*Amniotic Fluid Embolism*
AIDS	*Acquired Immune Deficiency Syndrome*
ALL	*Acute lymphoblastic leukemia*
AMH	*Anti Mullarian Hormone*
APH	*Antepartum Hemorrhage*
ARDS	*Adult Respiratory Distress Syndrome*
ART	*Assisted Reproductive Technology*
ASA	*American Society of Anesthesiologist*
ATOTW	*Anesthesia Tutorial Of The Week*
BMI	*Body Mass Index*
CDC	*Center of Disease Control*
CEMD	*Confidential Enquiries into Maternal Deaths*
CHD	*Congenital Heart Disease*
CHF	*Chronic Heart Failure*
COAD	*Chronic Obstructive Air way Disease*
COS	*Controlled Ovarian Stimulation*
CPD	*Cephalopelvic disproportion*
CPD	*Cephalopelvic Pelvic Disproportion*
CPR	*Cardiopulmonary Resuscitation*
CVS	*Cerebrovascular Stroke*
DCM	*Dilated Cardiomyopathy*
DIC	*Disseminated Intravascular Coagulopathy*
DIC	*Disseminated Intravascular Coagulopathy.*
DM	*Diabetes Mellitus*
DVT	*Deep Venous Thrombosis*
EBV	*Epstein - Barr virus*
EBV	*Estimated blood volume*
eNOS	*Endothelial nitric oxide synthetase*
EOC	*Emergency Obstetric Care*
FPG	*Fasting Plasma Glucose*
GDM	*Gestational Diabetes Mellitus*

List of Abbreviations cont...

Abb.	Full term
GNP	*Gross National Product*
HEG	*Hyper Emesis Gravidarum*
HIS	*Health Information System.*
HIV	*Human Immuno Deficiency Virus*
HLA	*Human Leukocyte Antigen*
HR	*Heart Rate*
IADPSG	*International Association of the Diabetes and Pregnancy Study Group*
ICD	*International Classification of Disease*
ICU	*Intensive Care Unite*
INR	*International Normalized Ratio*
LCF	*Liver cell failure*
LVEF	*Left Ventricular Ejection Fraction*
LVSD	*Left Ventricular Systolic Dysfunction*
MDG	*Millennium Development Goal*
MMR	*Maternal Mortality Ratio*
MMRate	*Maternal mortality rate*
MODS	*Multiple Organ Dysfunction Syndromes*
MSOF	*Multi System Organ Failure*
NCHS	*National Center for Health Statistics*
NHI-IC	*National Health Information-Insurance Company.*
NYHA	*New York Heart Association*
OGTT	*Oral Glucose Tolerance Test*
OHSS	*Ovarian Hyperstimulation Syndrome*
PE	*Pulmonary Embolism*
PEEP	*Positive End Expiratory Pressure*
PID	*Pelvic Inflammatory Disease*
PPCM	*Peripartum Cardiomyopathy*
PPH	*Post-partum heamorrhage*
PT	*Prothrombin Time*
RCO	*Royal College of Obstetricians and Gynecologists*

List of Abbreviations cont...

Abb.	Full term
rFVIIa	*Recombinant activated factor VII*
RHD	*Rheumatic Heart Disease*
RRT	*Rapid Response team*
sFlt-1	*Placental Soluble Fms-Like Tyrosine Kinase 1*
SIRS	*Systemic Inflammatory Response Syndrome*
SLE	*Systemic Lupus Erythematosus*
SPSS	*Statistical Package for Social Sciences.*
SVR	*Systemic Venous Resistance.*
TBNHI	*Taiwan's Bureau of National Health Insurance.*
TOP	*Termination of pregnancy*
UK	*United Kingdom.*
UN	*United Nations.*
US	*United States.*
VEGF	*Vascular Endothelial Growth Factor.*
VTE	*Vascular thrombo embolism.*
WCC	*White cell count.*
WHO	*World Health Organization.*

INTRODUCTION

Maternal death is the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes. To facilitate the identification of maternal deaths in circumstances in which cause of death attribution is inadequate, a new category has been introduced: Pregnancy-related death is defined as the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the cause of death ***(WHO. ICD, 2010).***

The number of maternal deaths in a population is essentially, the product of two factors: the risk of mortality associated with a single pregnancy or a single live birth, and the number of pregnancies or births that are experienced by women of reproductive age. The (MMR) Maternal mortality ratio is defined as the number of *maternal deaths* during a given time period per 100 000 *live births* during the same time-period. It depicts the risk of maternal death relative to the number of live births. While maternal mortality rate (MMRate) is the number of *maternal deaths* in a given period per 100 000 *women of reproductive age* during the same time-period. It reflects not only the risk of maternal death per pregnancy or per birth (live birth or stillbirth), but also the level of fertility in the population ***(WHO, 2010).***

Maternal deaths should be divided into two groups: *Direct obstetric* deaths are those resulting from obstetric complications of the pregnant state (pregnancy, labor and the pueperium), from interventions, omissions, incorrect treatment, or from a chain of events resulting from any of the above. *Indirect obstetric* deaths are those resulting from previous existing disease or disease that developed during pregnancy and which was not due to direct obstetric causes, but was aggravated by physiologic effects of pregnancy (e.g., cardiac disease, psychiatric illness, hepatic disease). The drawback of this definition is that maternal deaths can escape being so classified, because the precise cause of death cannot be given even though the fact of the woman having been pregnant is known ***(AbouZahr and Wardlaw, 2000).***

Direct obstetric deaths have six major causes: hypertensive disease of pregnancy, hemorrhage, infections, sepsis, thromboembolism, and in developing countries, obstructed labor and complications from illegal abortion. There are other *direct causes* of death, such as ectopic Pregnancy, complications of anesthesia, and amniotic fluid embolism. The main causes of *indirect* obstetric deaths are asthma, heart disease, type1 diabetes, systemic Lupus erythematosus and other conditions that are aggravated by pregnancy to the point of death ***(Timothy et al., 2007).***

Other maternal health factors were found to affect the maternal mortality and categorized as five interlinked causes:

poverty low socioeconomic status of women, poor nutrition and general health, poor availability of good quality health services and inadequate contraceptive reproductive choices ***(Maine, 2001).***

Maternal mortality is unacceptably high. About 830 women die from pregnancy- or childbirth-related complications around the world every day. It was estimated that in 2015, roughly 303 000 women died during and following pregnancy and childbirth. Almost all of these deaths occurred in low-resource settings, and most could have been prevented ***(Alkema et al., 2016).***

In 2015, maternal mortality ratio for Egypt was 33 deaths per 100,000 live births. Between 1996 and 2015, maternal mortality ratio of Egypt was declining at a moderating rate to shrink from 78 deaths per 100,000 live births in 1996 to 33 deaths per 100,000 live births in 2015. Over the last 25 years, Egypt has recorded important achievements in improving child and maternal survival and health. Between 1988 and 2014, the under-5 mortality rate (U5MR) declined from 108 to 27 child deaths per 1,000 live births; slightly more than half of these deaths occurred in the first month of the child life ***(UNICEF EGYPT. MoHP, 2014).***

AIM OF THE STUDY

This is a retrospective descriptive study of maternal mortality analysis, in Ain Shams Maternity Hospital during the period, from beginning of 2014 to year 2017.

The aim of this study is to determine the factors contributing to maternal mortality, especially the avoidable factors and to evaluate the possibility of prevention of such factors, to decrease the incidence of maternal mortality to the least possible value, and finally to make some recommendations and comments for possible preventive measures.

Chapter (1)

INDICES

The death of any woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes ***(WHO. ICD 2010)***.

Direct maternal deaths is defined as deaths resulting from obstetric complications of pregnant state (pregnancy, labor, and the pueperium) from interventions, omissions, incorrect treatment or from a chain of events ,resulting, from any of the above ***(Hoyert, 2007).***

Indirect maternal deaths are also defined as deaths resulting from previous existing disease that developed during pregnancy and which was aggravated by the physiological effects of pregnancy ***(Hoyert, 2007).***

Late maternal deaths are defined as the death of a woman from direct or indirect causes more than 42 days but less than one year after termination of pregnancy(after, abortion, miscarriage or delivery) ***(Hoyert, 2007).***

Pregnancy associated death the death of a woman while pregnant while or within 1 year of termination of pregnancy, irrespective of cause ***(Berg et al., 2001).***

Pregnancy related death: the death of a woman while pregnant or within 1 year of termination of pregnancy irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by her pregnancy or its management but not from accidental or incidental causes ***(Berg et al., 2001).***

Maternal mortality ratio (MMR): Number of maternal deaths during a given time period per 100 000 live births during the same time period.

Maternal mortality rate (MMRate): Number of maternal deaths in a given period per 100 000 women of reproductive age during the same time period.

Adult lifetime risk of maternal death: The probability that a 15-49year-old women will die eventually from a maternal cause.

The proportion of maternal deaths among deaths of women of reproductive age (PM): The number of maternal deaths in a given time period divided by the total deaths among women aged 15–49 years ***(WHO Library, 2012).***

The fifth MDG(Millennium Development Goals) aims to improve maternal health, with a target of reducing the MMR by 75% between 1990 and 2015. The 10 countries that had achieved MDG 5 by 2010 are Estonia (95%), Maldives (93%), Belarus (88%), Romania (84%), Bhutan (82%), Equatorial