

An Autopsy Study of Maternal Mortality in Egypt

Thesis
Submitted for partial fulfillment of
MD degree in pathology
By
Rasha Mohamed Samir
Under the supervision of

Prof. Dr. Ahmed Mohamed Yehia El Hennawy
Professor of pathology
Faculty of Medicine
Cairo University

Prof. Dr. Samira Abd Allah Mahmoud
Professor of pathology
Faculty of Medicine
Cairo University

Dr. Hanan Hosny Hassan
Forensic Pathologist (MD)
Medicolegal Administration
Ministry of Justice

2014



Acknowledgement

I would like to express my gratitude to **Prof. Dr./ Ahmed Mohamed Yehia El-Hennawy**, for his guidance, support, encouragement, and optimism throughout this work.

I would like to thank **Prof. Dr./ Samira Abd Allah Mahmoud**, for her constructive feedback and advice which helped steer this study.

I would also like to thank **Dr./ Hanan Hosny Hassan** for her valuable comments and suggestions which helped improve the contents and presentation of this work.

I would like to acknowledge the support of my colleagues at **Cairo Medicolegal Authority** for providing some of the data used in this study.

Last but not least, my deep gratitude goes to **my parents, my husband and my children** for their encouragement and support.

Contents

Acknowledgement.....	ii
Contents.....	iii
list of figures.....	v
list of Tables.....	viii
Abbreviations.....	x
Introduction.....	1
Aim of work.....	3
The Autopsy.....	4
Review of Literature.....	18
Chapter 1: Maternal mortality.....	18
Chapter 2: Direct causes of maternal mortality.....	23

Chapter 3: Indirect causes of maternal mortality (other specific conditions).	59
Material and method.....	72
Results.....	76
Discussion.....	127
Summary.....	151
Conclusions and Recommendations.....	154
References.....	156
الملخص العربى.....	189

List of Figures

Fig.(1)	Autopsy incisions	7
Fig.(2)	Types of placenta previa	25
Fig.(3)	The relation between method of delivery and puerperal sepsis.	92
Fig.(4)	The relation between age and puerperal sepsis	92
Fig.(5)	Subcapsular and interstitial hemorrhage in case of PPH complicated by DIC	97
Fig.(6)	Lung fibrin thromboemboli in case of DIC due to PPH	97
Fig.(7)	Placenta percreta	98
Fig.(8)	Placenta percreta	98
Fig.(9)	Placenta percreta invaded the uterine wall out to the serosa	99
Fig.(10)	Cervical laceration in a case of PPH	99
Fig.(11)	Uterine laceration in a case of PPH	100
Fig.(12)	Retained placental tissue in a case of PPH	100
Fig.(13)	Retroplacental hematoma (abruptio placenta) in a case of antepartum hemorrhage	101
Fig.(14)	Pneumonia in a case of puerperal sepsis	102
Fig.(15)	Brain microabscess in a case of puerperal sepsis	102
Fig.(16)	Meningitis in a case of puerperal sepsis	103
Fig.(17)	Meningitis in a case of puerperal sepsis(high magnification)	103
Fig.(18)	Respirator brain in case of puerperal sepsis	104
Fig.(19)	Septic emboli (lung) in a case of puerperal sepsis	104
Fig.(20)	Pyelonephritis in case of puerperal sepsis	105
Fig.(21)	A case of puerperal sepsis showed markedly inflamed intestinal segment with inflamed serosa (peritonitis)	105
Fig.(22)	Hemorrhagic infarction of the brain in case of puerperal sepsis	106
Fig.(23)	Hemorrhagic infarction of the brain in case of puerperal sepsis (high magnification)	106
Fig.(24)	interstitial nephritis in a case of puerperal sepsis	107
Fig.(25)	Pericarditis in a case of puerperal sepsis	107
Fig.(26)	Lung suppuration in a case of puerperal sepsis	108

Fig.(27)	Pneumonia and micro abscesses in a case of puerperal sepsis	108
Fig.(28)	Peritonitis in a case of puerperal sepsis	109
Fig.(29)	Hyaline membrane disease of the lung in a case of preeclampsia	110
Fig.(30)	Trophoblastic emboli in a case of preeclampsia	110
Fig.(31)	Higher magnification of the previous figure	111
Fig.(32)	Brain congestion and edema in a case of preeclampsia	111
Fig.(33)	Brain congestion and edema in a case of preeclampsia (higher magnification)	112
Fig.(34)	Thrombo-emboli of the pulmonary vessels in a case of preeclampsia complicated by DIC	112
Fig.(35)	Thrombo-emboli of the renal vessels in a case of preeclampsia complicated by DIC	113
Fig.(36)	Lung suppuration in case of preeclampsia	113
Fig.(37)	Colonic perforation in a case of induced abortion	114
Fig.(38)	Intestinal perforation in case of abortion	114
Fig.(39)	Photomicrograph of the colonic perforation site	115
Fig.(40)	Uterine fundus perforation in a case therapeutic abortion; the patient had rheumatic heart disease	115
Fig.(41)	A case of pulmonary thromboemboli	116
Fig.(42)	Lung infarction in a case of pulmonary thromboembolism	116
Fig.(43)	Amniotic fluid embolism; fetal squames within pulmonary vessels	117
Fig.(44)	Amniotic fluid embolism within uterine vessels	117
Fig.(45)	Amniotic fluid embolism within uterine vessels (high magnification)	118
Fig.(46)	Amniotic fluid embolism within pulmonary vessels	118
Fig.(47)	Higher magnification of the previous figure	119
Fig.(48)	Choriocarcinoma developed in tubal ectopic pregnancy	120
Fig.(49)	Lung metastasis in a case of choriocarcinoma	120
Fig.(50)	Bronchospasm in a case anaphylactic shock	121
Fig.(51)	A case of anaphylactic shock showing corrugated wall of bronchi due to smooth muscle contraction with invasion by mono nuclear inflammatory cells including mast cells	121

Fig.(52)	Pulmonary tuberculosis detected in a case died of anaphylactic shock	122
Fig.(53)	Adult respiratory syndrome in a case of indirect cause of death	122
Fig.(54)	Dilated cardiomyopathy	123
Fig.(55)	Lymphocytic myocarditis in case of dilated cardiomyopathy	123
Fig.(56)	Coronary artery atherosclerosis with calcification in case of ischemic heart disease	124
Fig.(57)	A case of chronic cardiac ischemia: fibroblasts and collagen bundles replacing cardiac muscle	124
Fig.(58)	Brain infarction in a case of chronic cardiac ischemia	125
Fig.(59)	Higher magnification of the previous figure	125
Fig.(60)	Neutrophilic myocarditis in a case of indirect cause of death, the patient died of pulmonary thrombo-embolism	126
Fig.(61)	Higher magnification of the previous figure	126

List of Tables

Table (1)	Cause of death in the studied cases	76
Table (2)	The frequency and percent of different causes of death:	77
Table (3)	Frequency and percentage of different types of direct maternal death	77
Table (4)	The geographic distribution of the maternal death among studied cases	81
Table (5)	The relation between geographic distribution and age related maternal death	82
Table (6)	The relation between geographic distribution and trimesteric gestational period	82
Table (7)	The relation between the geographic distribution and method of delivery	83
Table (8)	The relation between residence and Hospital stay	83
Table (9)	The frequency and percent of death in relation to age	84
Table (10)	The relation between method of delivery and age	84
Table (11)	The relation between age and coma	85
Table (12)	Relation between age and cause of death	85
Table (13)	Correlation between the cause of death and different methods of delivery	86
Table (14)	The relation between method of delivery and coma	87
Table (15)	Correlation between method of delivery and hysterectomy	88
Table (16)	The Cause of Postpartum hemorrhage	88
Table (17)	The relation between age and postpartum hemorrhage	89
Table (18)	The relation between the method of delivery and postpartum hemorrhage	90

Table (19)	The relation between the time of death and postpartum hemorrhage	91
Table (20)	The frequency of maternal death in relation to trimesteric gestational period	93
Table (21)	The relation between the trimesteric gestational period and cause of death	93
Table (22)	Frequency and percentage of different types of indirect maternal death	94
Table (23)	Frequency and percentage of different kinds of associated cause of maternal death	95
Table (24)	The relation between the time of death and number of maternal deaths	96

Abbreviations

AFE	Amniotic fluid embolism
AIDS	Acquired immune- deficiency syndrome
APH	Antepartum hemorrhage
ARDS	Adult Respiratory Distress Syndrome
Bpm	Beats per minute
BVs	Blood vessels
CC	Choriocarcinoma
CMACE	Centre for Maternal and Child Enquiries
C. section	Cesarean Section
DES	Diethylstilbestrol
DIC	Disseminated Intravascular Coagulation
ELFTs	Elevated liver function tests
FES	Fat embolism syndrome
GTD	Gestational trophoblastic disease
GU	Genitourinary
HCG	Human chorionic gonadotropin
HELLP	hemolytic anemia, elevated liver function tests and low platelet count
HIV	Human Immunodeficiency Virus
ICPD	International Conference on Population and Development
IHD	Ischemic heart disease
IUDs	Intrauterine devices
IV	Intravenous
LSCS	lower-segment cesarean sections
MDGs	Millennium Development Goals
MFMER	Mayo Foundation for Medical Education and Research
OL	Obstructed labor
PID	Pelvic inflammatory disease
P. falciparum	Plasmodium falciparum
PPH	Postpartum hemorrhage
PT	Prothrombin time
PTAH	Phosphotungstic acid-hematoxylin stain

PTT	Partial thromboplastin time
RCP ath	Royal College of Pathologists
RHD	Rheumatic heart disease
TF	Tissue factor
UNPF	United Nations Population Fund
U/S	Ultrasonography
VBAC	Vaginal Birth After Caesarean
VTE	Venous thromboembolism
WHO	World Health Organization



Introduction
