

# MEDICOLEGAL ASPECTS OF MATERNAL DEATHS OF OBSTETRICAL ORIGIN

(2006)

**Prof. Dr. OLA GABER HAGGAG** Professor of Forensic Medicine and Toxicology Benha Faculty of Medicine Benha University, **Prof. Dr. MARCELLE RAMSIS HAROUN** Prof. of Forensic Medicine and Toxicology Benha Faculty of Medicine Benha University, **Ass. Prof. Dr. ATEF ABD EL AZIZ FOUDA** Ass. Prof. of Forensic Medicine and Toxicology Benha Faculty of Medicine Benha University, **ABD ELMONIEM GODA MADBOULY** (M.B.B.Ch.).

## **Abstract:**

Understanding the extent of maternal deaths especially those due to medicolegal causes as homicide, suicide, accidents, illegal abortion and medical malpractice in women of childbearing age, may lead to improved identification of preventable problems that contribute to maternal morbidity and mortality. Maternal death due to unnatural (medicolegal) causes i.e. deaths due to violence, sudden and unexpected deaths, deaths due to medical malpractice and, in particular, those due to trauma- are increasing and forming the main causes of the maternal deaths. Maternal deaths due to natural causes i.e. direct or indirect obstetrical causes are decreasing nowadays, as a result of rapid progress in the methods of diagnosis and treatment of the various medical conditions affecting women during pregnancy, delivery and puerperium. Medical malpractice represented an important cause of the maternal deaths, especially with the development of the medical care standards. Because of this, if an accident happens the obstetrician more than any other doctor perhaps can find himself in the courts. To avoid this he has to know very well the causes of maternal mortality in order to avoid them as far as possible.

## **Introduction:**

Maternal death is death of a woman during pregnancy, labor or as a consequence of pregnancy or within 1 year of delivery or abortion. Direct maternal deaths, which resulted from obstetric complications of the pregnant state either from interventions, omissions, incorrect treatment or from a chain of events resulting from any of the above. Indirect maternal deaths, which resulted from a previous existing disease or disease that developed during pregnancy and was not due to direct obstetric causes, but which were aggravated by physiologic effects of pregnancy. Fortuitous (coincidental = pregnancy-associated) maternal deaths, which occur during pregnancy or the puerperium from any causes not directly related to the pregnancy or its complications or its management. (*Keeling & Gray, 2003*).

Information about unnatural death as a component of maternal mortality is incomplete and these deaths are likely to be under estimated due to a combination of factors. These deaths may be regarded as fortuitous deaths in some regions and largely ignored. As maternal deaths from both direct and indirect causes decline because of better provision of health care, before and during pregnancy, unnatural deaths comprise an increasing proportion of maternal deaths. It is important to look at unnatural deaths more critically as some would be better considered to be due to indirect rather than fortuitous causes and many are likely to be avoidable (*Krulewitch et al., 2001*).

### **Subjects and methods:**

This study based on the postmortem autopsy reports of maternal deaths of obstetrical origin i.e. during pregnancy, delivery and puerperium or from their complications that had been received at morgue of Zenhom - Ministry of Justice during the period from 1980 to 1990.

The collected data were be statistically analyzed as regard age, marital status (married or not), pregnancy stage (at which women died), causes of maternal deaths, mode (or mechanism) of maternal deaths, manner of maternal deaths, type of maternal deaths (according to the WHO classifications of maternal deaths), autopsy findings of maternal deaths, percentage of these cases in relation to the total number of deaths during the studied period.

### **Results:**

From the 135 cases of maternal deaths received at morgue of Zenhom - Ministry of Justice during the period from 1980 to 1990, we found that maternal deaths during the obstetrical period, i.e. during pregnancy, delivery and puerperium are distributed as shown in the followings tables:

**Table (1): Distribution of the studied group according to the circumstances of maternal deaths, whether natural or unnatural (medicolegal) deaths.**

Manner of death	No.	%
Natural	16	11.8
Unnatural deaths	118	87.5
Undetermined	1	0.7
<b>Total</b>	<b>135</b>	<b>100.0</b>

This table (or figure) clearly illustrates the higher prevalence of the unnatural (medicolegal) maternal deaths in relation to the natural maternal deaths, among the total number of maternal deaths during the study.

**Table (2): Number and percentage of each cause of unnatural (medicolegal) maternal deaths among the studied group.**

Cause of death	No.	%
Violent deaths	92	78.0
Malpractice	14	11.9
Sudden unexpected	12	10.1
Total	118	100.0

This table (or figure) shows higher prevalence of the violent maternal deaths in relation to the other causes of the unnatural (medicolegal) maternal deaths as medical malpractice and sudden unexpected maternal deaths.

**Table (3): Number and percentage of each cause of violent maternal deaths among the studied group.**

Cause of death	No.	%
Trauma	42	45.7
Poisoning	25	27.1
Burn	11	12.0
Illegal abortion	14	15.2
Total	92	100.0

This table (or figure) clearly illustrates the higher number and percentage of the traumatic causes of the violent maternal deaths followed by poisoning, abortion and burn.

**Table (4): Number and percentage of each type of the traumatic cases of maternal deaths among the studied group.**

Type of trauma	No.	%
Fall from height	2	4.8
Head trauma	8	19.0
Chest trauma	5	11.9
Abdominal trauma	9	21.5
Chest & abdominal trauma	2	4.8
Motor vehicle accident (MVA)	2	4.8
Firearm injury	6	14.1
Cut throat	3	7.1
Strangulation	5	11.9
Total	42	100.0

This table (or figure) illustrates the different types of the traumatic maternal deaths with higher percentage of abdominal, head and firearm injuries and small percentage for motor vehicle accident and fall from height.

**Table (5): Number and percentage of each type of the poisoning cases of maternal deaths among the studied group.**

Type of poisoning	No.	%
Organophosphorus compound (OPC) poisoning	18	72.0
Carbon monoxide poisoning	6	24.0
Digitalis toxicity	1	4.0
<b>Total</b>	<b>25</b>	<b>100.0</b>

This table (or figure) clearly illustrates the higher prevalence of the organophosphorus poisoning in comparison with the other poisoning causes of the maternal deaths as carbon monoxide poisoning and therapeutics toxicity.

**Table (6): Number and percentage of each cause of abortion related maternal deaths among the studied group.**

Cause of abortion	No.	%
Instrumental	13	87.0
Therapeutic	1	6.5
General violence	1	6.5
<b>Total</b>	<b>15</b>	<b>100.0</b>

This table (or figure) illustrates the wide spread of instrumental abortion in relation to the other methods of inducing it as general violence and therapeutic abortion which causing maternal deaths.

**Table (7): Number and percentage of the maternal deaths which were claimed to be medical malpractice cases.**

Malpractice Cause of death	No.	%
Uterine atony	4	38.6
Ruptured uterus	2	14.2
Eclampsia	3	21.5
Surgical shock	3	21.5
Anesthetic complication	1	7.1
Abortion (therapeutic)	1	7.1
<b>Total</b>	<b>14</b>	<b>100</b>

This table (or figure) shows that uterine hemorrhage either from complications of uterine atony or ruptured uterus represents the main cause of maternal deaths that were claimed as a malpractice cases

**Table (8): Number and percentage of each cause of the natural maternal deaths among the studied group.**

Cause of death	No.	%
Uterine atony	6	37.5
Puerperal sepsis	5	31.25
Eclampsia	2	12.5
Intrauterine fetal death (IUFD)	1	6.25
Cardiomyopathy	1	6.25
Pericardial effusion	1	6.25
<b>Total</b>	<b>16</b>	<b>100.0</b>

This table (or figure) illustrates that the most common natural causes of the maternal deaths are uterine atony, puerperal sepsis and hypertensive diseases of pregnancy (eclampsia).

**Table (9): Number and percentage of the maternal deaths according to the type of death (WHO classification).**

Type of death	No.	%
Direct	54	40.0
Indirect	2	1.5
Coincidental	78	57.8
Undetermined	1	0.7
<b>Total</b>	<b>135</b>	<b>100.0</b>

This table (or figure) clearly illustrates the high prevalence of the coincidental (fortuitous = pregnancy-associated) causes of maternal deaths among the other types of maternal deaths.

### **Discussion:**

Maternal mortality is an important problem in the world as every year almost 600.000 women (more than one every minute) die due to complications during pregnancy, delivery and puerperium. Whereas less than 1% of these occur in developed countries, the risk of death for pregnancy or delivery is very high (1/48) in the developing countries (*Biaggi et al., 2004*).

In the present study, we found that maternal deaths during the obstetrical period, i.e. during pregnancy, delivery and puerperium, due to natural causes have been significantly decreased as they accounting only for 16 cases (11.8 %) of the total 135 studied cases.

On the other hand, there was high prevalence of the unnatural (medicolegal) maternal deaths i.e. maternal deaths due to violence, medical malpractice and sudden unexpected maternal deaths which account for 118 cases (87.5 %) of the total 135 studied cases. This fact had been proved by *Keeling & Gray (2003)* who stated that maternal deaths from natural (direct and indirect) causes decline because of better provision of health care during pregnancy, whereas unnatural maternal deaths comprise an increasing proportion of maternal deaths, and it is important to look at them more critically as many are likely to be avoidable.

According to the present study, there was high prevalence of the violent maternal deaths among women during the obstetrical period which represents an important cause of maternal deaths and account for 92 cases (78.5 %) of the 118 unnatural (medicolegal) cases. This result was achieved by *Rizzia et al. (1998)* who stated that violence against women and mainly against pregnant women is a growing problem in developing countries.

According to the present study we found that the most important causes of violent maternal deaths were: trauma (42 cases = 46 %), poisoning (25 cases = 27%), illegal abortion (14 cases = 15%) and burns or fire (11 cases = 12%). In a study carried out by *Parsons & Harper (1999)* on 167 maternal deaths which occurred either during pregnancy or within the puerperium from 1992-1994, there was a significant increase in violent maternal deaths (62 cases = 38%), that distributed as follows: motor vehicle accidents (26 = 42%), firearm injuries (19 = 31%), poisoning (6 = 10%), cut and stab wounds (5 = 8%), burns (4 = 6%) and fall from height (2 = 3%).

The present study highlighted the role of poisoning as an important cause of maternal deaths during pregnancy and puerperium which represents alone about 25 = 27% of the violent deaths and about 18.5% of all maternal deaths during the period of the study. This result was proven by *Singh et al. (1997)* as the poisoning was the second most frequent cause of deaths in married women in Indian society.

According to the present study, abortion accounted for about 11.0 % of the total maternal deaths. This highlights the role of abortion and its complications as a cause of maternal deaths especially in the developing countries like Egypt as abortion is illegal except for limited situations. The maternal deaths as a result of abortion range between 60.000 and 100.000 per year with the majority of these in the developing countries (*Bernstein & Rosenfield, 1998*).

In the present study, the role of the medical malpractice as an important cause of the maternal deaths can not be ignored, as of 135 studied cases, 14 cases were claimed to be malpractice and represented about 10.3 %. *Brown (1993)* stated that there had been a noticeable increase in the number of obstetrical and gynecological medical malpractice cases. Developments in medical care standards have increased the patients' expectations from their physicians.

According to the present study, the distribution of causes of 14 medical malpractice maternal deaths was as follows: uterine atony (4 cases = 28.5%), eclampsia (3 cases = 21.4%), surgical shock (3 cases = 21.4%), rupture uterus (2 cases = 14.2%), anesthetic complications and therapeutic abortion (one case for each = 7.1%). In a retrospective study carried out by *Buken et al. (2004)* from 1990 to 2000, there were 636 cases of medical malpractice. It was established that 16.82% (n = 107) were due to obstetrical and gynecological medical malpractice. Among these cases, the primary cause of maternal death was hemorrhage, and the primary causes of hemorrhage were uterine rupture, uterine atony, eclampsia and retained placental fragments.

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