www.jmscr.igmpublication.org
Impact Factor (SJIF): 6.379
Index Copernicus Value: 71.58
ISSN (e)-2347-176x ISSN (p) 2455-0450
crossref DOI: https://dx.doi.org/10.18535/jmscr/v6i2.29

IGM Publication
Journal Of Medical Science And Clinical Research
An Official Publication Of IGM Publication

# Assessment of Various Causes of Maternal deaths – An Autopsy Study

Author
**Dr Mohammad Nasir Siddiqui**
M.D. Forensic Medicine
Medical Superintendent, Integral Institute of Medical Sciences & Research

**Abstract**
**Background:** *Maternal death has been used traditionally as a measure of quality of health care in a community with 16% world's population India accounts for over 20% of maternal deaths. The present study was conducted to assess causes of maternal deaths.*
**Materials & Methods:** *The present study was conducted in the department of forensic sciences. It included 22 pregnancy related deaths. Ethical clearance was obtained before starting the study.*
*General information such as gender, age, demographic profile and histopathological findings were recorded. Causes of deaths were also assessed.*
**Results:** *Age group 16-20 years had 7 cases, 20-24 years had 8 cases, 24-28 years had 4 cases, 28-32 years had 2 cases and 1 case was of age >32 years. The difference was significant (P-0.01). Causes of deaths was direct gestational (12), indirect gestational (6) and non- gestational (4) deaths. The difference was significant (P< 0.05). The most common direct gestational causes were pregnancy induced hypertension (4) followed by pre-eclampsia (3), amniotic fluid embolism (2), eclampsia (1), HELLP syndrome (1) and septic organ failure (1). The difference was significant (P< 0.05). Gestational causes as cardiac arrest (3), myocardial infarction (2) and pericardial temponade due to ruptured aortic aneurysm (1). The difference was significant (P< 0.05). Non gestational causes as multiple trauma (1), traumatic brain injury (2) and fatal nacrotic intoxication (1).*
**Conclusion:** *Pregnancy-induced hypertension, amniotic fluid embolism and cardiac arrest are the main contributors to directly gestation-related maternal death in pregnancy.*
**Keywords:** *Forensic, Gestational, Multiple trauma.*

## Introduction

The death of a woman in childbirth is a tragedy, an unacceptable and wasteful event that carries with a huge burden of grief and pain. Pregnancy is not a disease and pregnancy related morbidity and mortality are preventable. Maternal death has been used traditionally as a measure of quality of health care in a community with 16% world's population India accounts for over 20% of maternal deaths.[1]

The distinction between maternal death in pregnancy and pregnancy-related maternal death is not always easy. If maternal death occurs during or within 42 days after the termination of pregnancy, the criterion of ''gestational death'' is met. However, actual ''maternal deaths during pregnancy'' are only those deaths that can be traced back directly to gestational circumstances, and non-natural causes of death of pregnant women are not counted among them. Maintenance of data on maternal deaths is crucial to the implementation of maternal health programs in the country. Information provided by medical

autopsies has played an important role in increasing the accuracy of cause-of-death reports and improving clinical practice in the developed world. We carried out this study to understand the magnitude of maternal mortality in this region and also to know the cause of death and to find out preventive factor.[2]

Maternal deaths can again be divided into direct gestational deaths which are due to complications of gestation (pregnancy, delivery and postpartum) or by gestation related medical interventions, omissions and improper handling, (i.e., fatal gestational hypertension or fatal delivery complications). Indirect gestational deaths are caused by pre-existing cardiovascular diseases of non obstetric origin which decompensate due to the physiological effects of pregnancy, birth and postpartum; the heart rate increases by 10–30 bpm, and the cardiac output up to the 32nd week of gestation by 30–50 % etc.[3] The present study was conducted to assess causes of maternal deaths.

## Material & Methods

The present study was conducted in the department of forensic sciences. It included 22 pregnancy related deaths. Ethical clearance was obtained before starting the study.

General information such as gender, age, demographic profile and histopathological findings were recorded. Causes of deaths were also assessed. Results thus obtained were subjected to statistical analysis using chi- square test. P value less than 0.05 was considered significant.

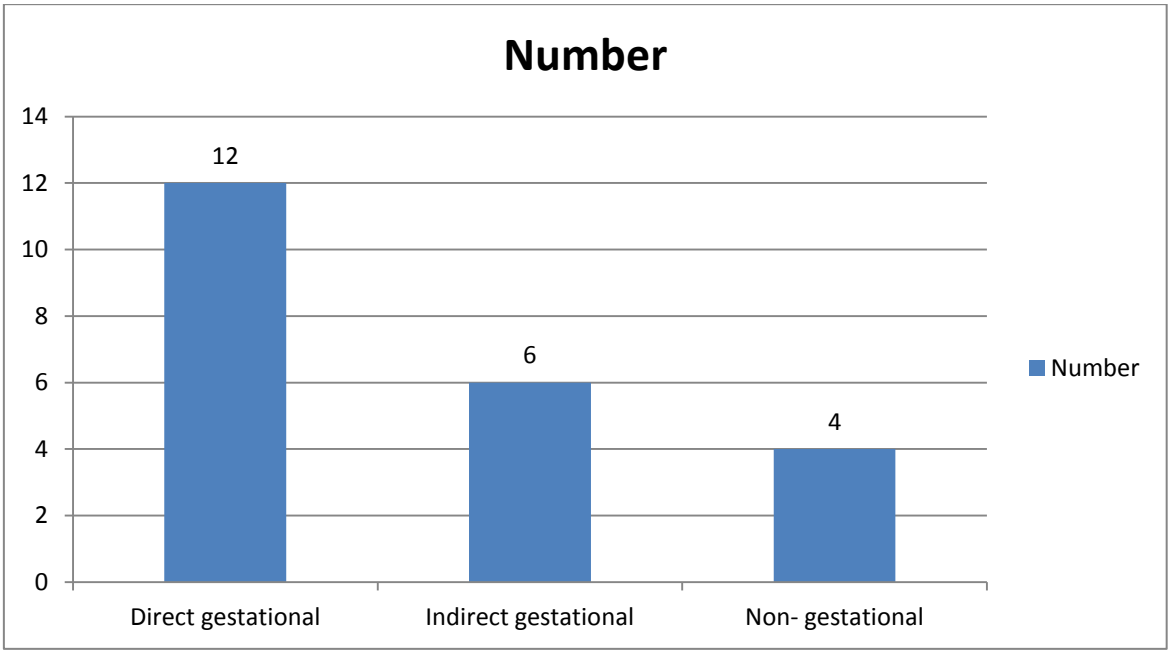
## Results

**Table I** Age wise distribution

| Age group (years) | Number | P value |
|---|---|---|
| 16-20 | 7 | 0.01 |
| 20-24 | 8 | |
| 24-28 | 4 | |
| 28-32 | 2 | |
| >32 | 1 | |

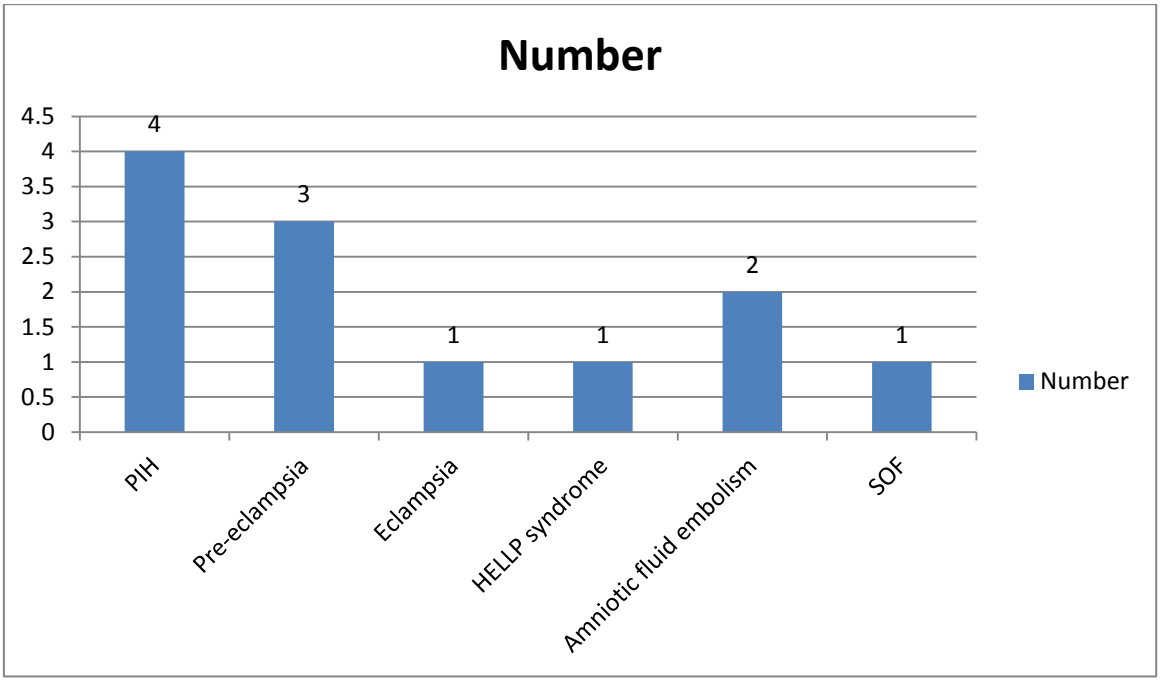
Table I shows that age group 16-20 years had 7 cases, 20-24 years had 8 cases, 24-28 years had 4 cases, 28-32 years had 2 cases and 1 case was of age >32 years. The difference was significant (P-0.01).

**Graph I** Causes of deaths



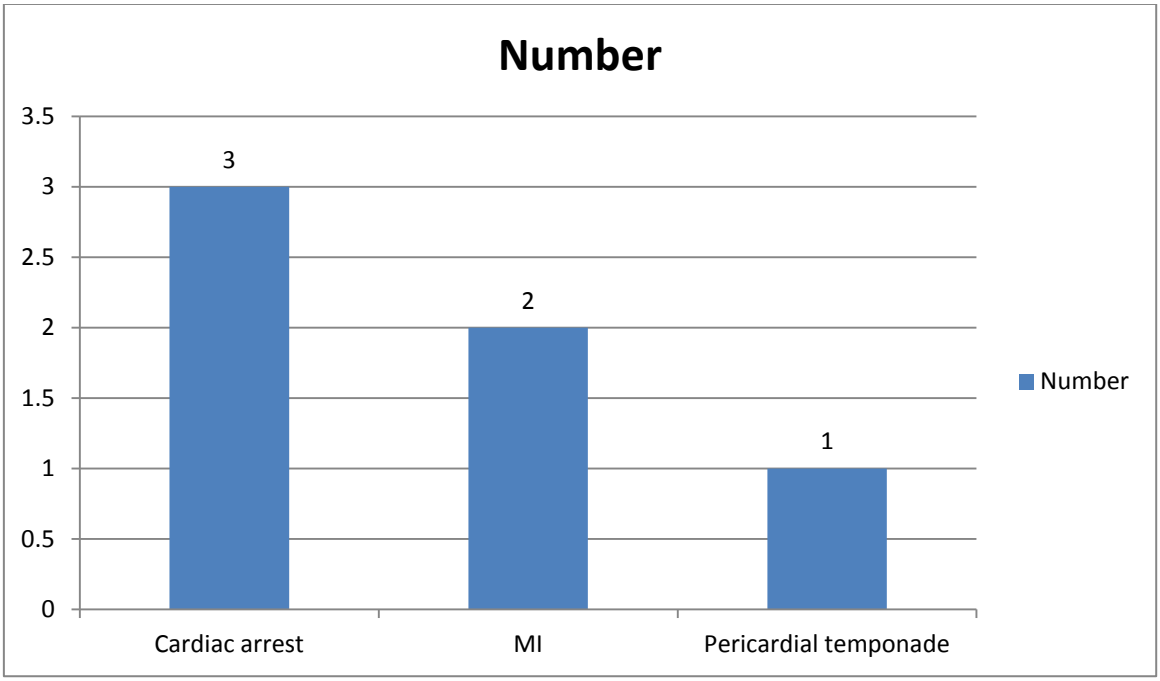

Graph I shows that causes of deaths was direct gestational (12), indirect gestational (6) and non-gestational (4) deaths. The difference was significant (P< 0.05).

**Graph II** Direct gestational causes



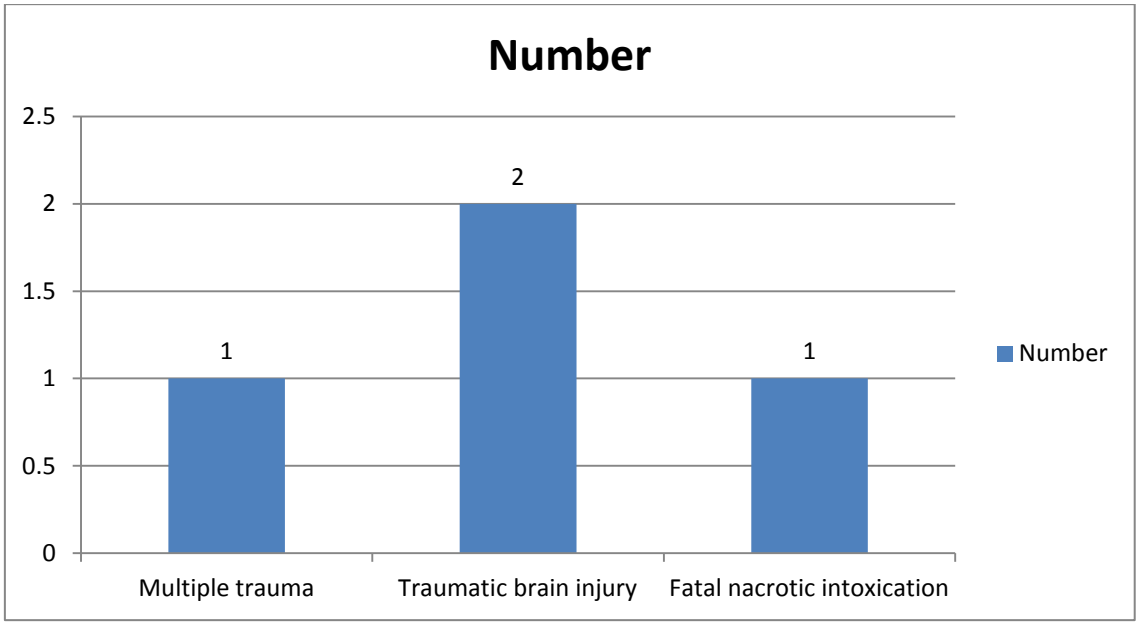

Graph II shows that most common direct gestational causes were pregnancy induced hypertension (4) followed by pre-eclampsia (3), amniotic fluid embolism (2), eclampsia (1), HELLP syndrome (1) and septic organ failure (1). The difference was significant (P< 0.05).

**Graph III** Indirect gestational causes




Graph III shows indirect gestational causes as cardiac arrest (3), myocardial infarction (2) and pericardial temponade due to ruptured aortic aneurysm (1). The difference was significant (P< 0.05).

**Graph IV** Non gestational cause




Graph IV shows non gestational causes as multiple trauma (1), traumatic brain injury (2) and fatal nacrotic intoxication (1).

**Discussion**

According to the World Health Organization, 55% of maternal deaths occur in Asia, 40% occur in Africa, and only 1% occurs in developed countries. Over 600000 maternal deaths occur each year worldwide. In India, many women dies due to pregnancy-related complications and those who survive suffer from severe maternal morbidity. Maternal death rate in India was 1000 per 100000 live births in 1959 and it decreased to 301 per 100000 live births in 2003. Complete and accurate identification of all deaths associated with pregnancy is a critical first step in the prevention of such deaths. Only by having a clear understanding of the changing trends and the magnitude of pregnancy-related mortality can be comprehensive prevention strategies be formulated to prevent these unanticipated deaths among women.[4]

We found that age group 16-20 years had 7 cases, 20-24 years had 8 cases, 24-28 years had 4 cases, 28-32 years had 2 cases and 1 case was of age >32 years. The causes of deaths were direct gestational, indirect gestational and non-gestational deaths. This is similar to Robertson et al.[5]

We found that most common direct gestational causes were pregnancy induced hypertension followed by pre-eclampsia, amniotic fluid embolism, eclampsia, HELLP syndrome and septic organ failure. This is in agreement with Huppertz B. et al.[6]

Gestational hypertension or pregnancy-induced hypertension (PIH) is the development of new hypertension in a pregnant woman after 20 weeks gestation without the presence of protein in the urine or other signs of preeclampsia. HELLP syndrome consists of a characteristic pathology of the liver with typical periportal necrosis in zone 1 and intraparenchymal hemorrhage.[7]

Amniotic and thromboembolic events are the second most common cause of maternal death in pregnancy difficult to determine, with frequency estimates ranging from 1:8,000 to 1:80,000.

An amniotic fluid embolism (AFE) is a rare childbirth (obstetric) emergency in which amniotic fluid, enters the blood stream of the mother to trigger a serious reaction. This reaction then results in cardiorespiratory (heart and lung) collapse and massive bleeding (coagulopathy).

We found that indirect gestational causes as cardiac arrest, myocardial infarction and pericardial temponade due to ruptured aortic aneurysm. Non gestational causes are multiple

trauma, traumatic brain injury and fatal nacrotic intoxication.[8]

Pulmonary embolism (PE) is a leading cause of death among pregnant women in the developed world. The fact that PE remains such a threat is a clear indication of the difficulty in diagnosing it. The coexistence of pregnancy makes the workup and management of PE even more problematic, for many reasons.[9]

**Conclusion**

Pregnancy-induced hypertension, amniotic fluid embolism and cardiac arrest are the main contributors to directly gestation-related maternal death in pregnancy.

**References**


1. Montagnana M, Franchi M, Danese E, et al. Disseminated intravascular coagulation in obstetric and gynecologic disorders. Semin Thromb Hemost. 2010; 36:404–18.
2. Thachil J, Toh CH. Disseminated intravascular coagulation in obstetric disorders and its acute haematological management. Blood Rev. 2009; 23:167–76.
3. Harun T. Amniotic fluid embolism. Eur J Gen Med. 2009; 6: 108–15.
4. Conde-Agudelo A, Romero R. Amniotic fluid embolism: an evidence-based review. Am J Obstet Gynecol. 2009; 201: 1–13.
5. Robertson WB, Brosens I, Dixon HG. The pathological response of the vessels of the placental bed to hypertensive pregnancy. J Pathol Bacteriol. 1967; 93:581–92.
6. Huppertz B, Peeters LLH. Vascular biology in implantation and placentation. Angiogenesis. 2005;8:157–67.
7. Gist RS, Stafford IP, Leibowitz AB, et al. Amniotic fluid embolism. Anesth Analg. 2009; 108:1599–602.
8. Kretzschmar M, Zahm DM, Remmler K, et al. Anaphylactoid syndrome of pregnancy. Anaesthesist. 2003; 52:419–26.
9. Prahlow JA, Barnard JJ. Pregnancy-related maternal deaths. Am J Forensic Med Pathol. 2004; 25:220–36.