ISSN: 2581 – 3633
PubMed - National Library of Medicine - ID: 101745081

International Journal of Medical Science and Advanced Clinical Research (IJMACR)

Available Online at:www.ijmacr.com

Volume – 9, Issue – 3, May – 2026, Page No.: 59 – 68

A Retrospective Autopsy Based Study to Estimate Frequency and to Assess the Causes of Antepartum, Intrapartum and Postpartum Deaths

[1]Dr. Tejas Kumar M, Assistant Professor, BGS Global Institute of Medical Sciences, Kengeri, Bengaluru

[2]Dr. Snigdha Parui, Senior Resident, Vydehi Institute of Medical Sciences & Research Centre, Nallurhalli, Bangalore

[3]Dr. Fathima Fahmi Shirin. M, Assistant Professor, East Point College of Medical Sciences & R C, Bidarahalli, Bengaluru

[4]Dr. S Venkata Raghava, Professor and HOD, Department of Forensic Medicine & Toxicology, Bangalore Medical College and Research Institute, Bangalore

Corresponding Author: Dr. Fathima Fahmi Shirin. M, Assistant Professor, East Point College of Medical Sciences & R C, Bidarahalli, Bengaluru

How to citation this article: Dr. Tejas Kumar M, Dr. Snigdha Parui, Dr. Fathima Fahmi Shirin. M, Dr. S Venkata Raghava, "A Retrospective Autopsy Based Study to Estimate Frequency and to Assess the Causes of Antepartum, Intrapartum and Postpartum Deaths", IJMACR – May – 2026, Volume – 9, Issue – 3, P. No. 59 – 68.

Type of Publication: Original Research Article

Conflicts of Interest: Nil

Abstract

Maternal mortality is considered a key health indicator of maternal and child health. Maternal deaths can be due to direct and indirect obstetric causes. Autopsy and histopathology based study helps in the holistic understanding of these pathological features that can be clinically correlated. In order to prevent maternal deaths, obtaining insights into the underlying pathophysiological factors as well as sociodemographic details that leads to maternal deaths is crucial. This is an autopsy based study done in Department of Forensic Medicine and Toxicology of Victoria Hospital, Bengaluru. Pregnancy is associated with a combination of social and emotional changes along with the physiological challenges. Hence mental health issues that are associated with pregnancy have also been analysed in this study This study will aid in identifying the data needs related to maternal deaths and inform the stakeholders responsible for maintenance and formulating new health policies that can be implemented in the grass root level of the maternal health care system of the country.

Keywords: Maternal death, Histopathology, Sepsis, DIC (Disseminated Intravascular Coagulation), Autopsy, PPH (Postpartum haemorrhage)

Introduction

Maternal mortality ratio in India is 97 per one lakh live births as per SRS (Sample registration system) 2000 in the year 2018-20.[1] This is 6 points lower than year 2017-19 when it was 103 per one lakh live births.[1] Upon achieving this, India has achieved its target of MMR of

less than 100/lakh live births as per the Sustainable development goals. The state of Karnataka (69) ranks 8th in India in the order of various states with the lowest MMR with Kerala leading the scoreboard at 19.[1] This improvement can be attributed to the various government schemes like Pradhan Mantri Surakshit Matritva Abhiyan (PMSMA) and Surakshit Matritva Aashwasan (SUMAN) are aimed at identifying high risk pregnancies and facilitating the appropriate management in all such cases.[2]

Continuous surveillance and monitoring is required at ground level for further lowering of the MMR with special emphasis on the tagline "Healthy mom = Healthy baby". However, attention should be paid to the mental health care needs of both pregnant and post-partum mothers – a topic which is seldom taken into heed.

Even though there are literature regarding maternal deaths, majority of them are based solely on clinical findings. An autopsy and histopathology based study confirms, contradicts or collaborates the clinical diagnosis. In scenarios where the cause of maternal death was aggravated by coexisting or undiagnosed pathological conditions, gross and microscopic examination of individual organs will help us in elucidating the etiology in a more reliable way. The present study is an attempt to bridge this lacunae of findings between clinical diagnosis and histopathology and autopsy based observations.

The study aims to understand the main causes of female deaths -antepartum, intrapartum and postpartum whether due to medical or psychiatric causes to give a baseline data for the policymakers to make adequate changes in existing or future government initiatives.

Materials and Methods

Retrospective analysis with data collection done from postmortem reports and final opinion furnished by Department of Forensic Medicine and Toxicology, Victoria hospital. The samples were gravid females who died due to certain antecedent pregnancy complications or suicide during pregnancy or intra-partum/birth causes and the post partum females who died due to pregnancy related complications till 6 weeks following termination of pregnancy.

Objectives

- To estimate commonest cause of antepartum, intrapartum and post-partum deaths.
- To estimate prevalence of maternal deaths according to the age group.
- To estimate prevalence of Anemia.

Study Population: Cases of females died during pregnancy and postpartum sent for autopsy to Department of Forensic Medicine and Toxicology, Victoria hospital.

Study Period: 1/1/2021 to 31/12/2023 for a period of 3 years.

Inclusion Criteria

1. All gravid female dead bodies sent for autopsy to Victoria hospital mortuary.
2. All postpartum cases sent for autopsy to Victoria hospital mortuary.

Exclusion Criteria

1. Maternal deaths due to assault, road traffic accident.

Study Design: 3 Year Retrospective Descriptive case series

Definitions

Maternal deaths: The death of a woman during pregnancy or within 42 days of termination of pregnancy

- Any site or any duration of pregnancy

- Any cause related to or aggravated by pregnancy o its management
- Death not from accidental causes

Direct Obstetric Cause

Deaths due to pregnancy including labour and postnatal period up to 6 weeks, due to any interventions, incorrect management and complications

Indirect Obstetric Cause

Deaths due to diseases that were present prior to or developed during pregnancy

Direct Obstetric Causes	Indirect Obstetric Causes
Eclampsia	Hanging
Shock consequent upon injury to uterus	Burns
Sepsis	Hypoxic ishchemic encephalopathy
Septic abortion	Chronic respiratory disease
Shock due to rupture due to ectopic pregnancy	Cardiac failure
Intrapartum rupture of uterus	Shock due to esophageal variceal rupture
DIC due to placental abruption	Respiratory failure (TB)
Amniotic fluid embolism	
Postpartum haemorrhage	

Antepartum Deaths

Cause	% of Cases	Number of Cases
1) Hanging	37	13
2) Eclampsia	2.8	1
3) Burns	5.7	2
4) Shock Consequent Upon Injury To The Uterus	2.8	1
5) Treated Hanging/ Hypoxic Ischemic Encephalopathy	2.8	1
6) Poisoning	2.8	1
7) Respiratory Failure (Diffuse Alveolar Hemorrhage)	2.8	1
8) Septic Abortion	2.8	1
10) Sepsis Due To IUFD	2.8	1
11) Cardiac Failure	2.8	1
12) Shock And Hemorrhage Due To Rupture Of Oesophageal Varices	2.8	1.
13) Shock And Hemorrhage Due To Ruptured Ectopic Pregnancy	2.8	1
14) Cause Cannot Be Ascertained	5.7	2

Intrapartum Deaths

1) Rupture Uterus (Shock And Hemorrhage)	2.8	1

Postpartum Deaths

Cause	% Of Cases	Number Of Cases
1)Dic/Placental Abruption	5.7	2
2)Postpartum Hemorrhage	8.57	3
3) Amniotic Fluid Embolism	2.8	1
5) Respiratory Failure(Tb)	2.8	1

Age Range in Postpartum Deaths

Age Range(Years)	% Of Cases	Number Of Cases.
10-20	28	2
21-30	57	4
31-40	`14	1
41-50	0	0

Age Range in Antepartum Deaths

Age Range (Years)	% Of Cases	Number Of Cases
10-20	14	4
21-30	66	18
31-40	18.5	5
41-50	0	0

Deaths Correlated with Area of Residence

Area Of Residence	Urban	Rural
Postpartum Deaths	4	3
Antepartum Deaths	11	16
Intrapartum Deaths	NA	1
Total	15	20

Results

This study includes 35 maternal deaths which were brought for autopsy in Mortuary of Department of Forensic Medicine of Victoria Hospital. Out of 35 cases, 7 cases (20 %) were postpartum deaths, out of which 28 % were due to between the age group of 10 – 20 years, 57 % belong to age range of 21- 30 years,14 % were in the 31 – 40 years age group.

A total of 27 cases (77 %) were antepartum deaths, out of which 14 % belonged to age range between 10 – 20 years, 66 % were in age between 21 – 30 years, 18. 5 % were in age group of 31 – 40 years. NO cases were reported between the age group of 40 – 50 years in antepartum, intrapartum or postpartum deaths.

Out of all the maternal deaths, twenty-seven (77 %) cases were antepartum deaths. Thirteen cases (37 %)

were due to hanging, one case (2.8 %) was due to eclampsia, two cases (5.7) were due to burn injuries sustained, one case (2.8 %) was due to shock consequent upon injury sustained to the uterus, one case (2.8%) was due to hypoxic ischemic encephalopathy due to hanging, one case was due to poisoning (2.8 %), one case (2.8 %) due to diffuse alveolar damage, one case (2.8 %) due to septic abortion, one case (2.8) was due to sepsis consequent upon intra uterine fetal death , one case (2.8 %) due to cardiac failure due to preexisting cardiac condition, one case (2.8 %) due to haemorrhagic shock due to rupture of oesophageal varices , and one case (2.8 %) due to haemorrhagic shock due to ruptured ectopic pregnancy.

The death due to eclampsia was that of a 30 years old female, 32 weeks' gestation with history of gestational diabetes and hypertension. She presented with generalized tonic clonic seizures with post-ictal unconsiousness. On the way to referral hospital, she had another episode of seizures and died on the way. Histopathological examination of lung parenchyma shows focal areas of pulmonary oedema with congested blood vessels and neutrophilic infiltration in the interstitium. Aggregates of chronic inflammatory cells comprising of lymphocytes and macrophages at places were observed. Hence the death was due to eclampsia.

The case where death due to shock consequent upon injury to the uterus was that of a 37 years old female with history of fall. Histopathological examination of uterus revealed myometrium showing hemorrhage with extravasated RBCs and congestion at the site of discoloration hence indicating antemortem injury of uterus with a male dead fetus as its content.

The case where death due to hypoxic ischemic encephalopathy due to hanging is that of a 20 years old female with history of attempted hanging but she was subsequently treated. However she developed septic shock, aspiration pneumonia and hypoxic ischemic encephalopathy and succumbed to the same.

The case of poisoning was that of a 25 years old female with a period of gestation 25 weeks. On perusal of chemical analysis report from forensic science laboratory death was due to respiratory failure as a result of consumption of substance containing phosphide ions.

The case of death due to diffuse alveolar damage to the lungs was that of a 28 years old female with period of gestation 26 weeks who had chronic respiratory disease of noninfectious nature. Histopathology of lungs revealed the diagnosis.

The case of septic abortion was that of a 23years old female who had consented for MTP via D&C (Dilatation and curettage) which in itself caused a accidental perforation at the uterine fundus followed subsequently by peritonitis and septicemia with ischemic enteritis. On histopathological examination uterus shows exudates and necrosis and sigmoid colon shows full thickness ischemic necrosis.

The case of ruptured ectopic pregnancy was that of a 23 years old female with rupture of ectopic pregnancy in the right fallopian tube with subsequent death due to shock and hemorrhage.

In 2 cases (5.7%) cause of death could not be ascertained due to the body being discovered in an advanced state of decomposition.

Among the 35 cases of maternal deaths, two cases (5.7 %) were due to disseminated intravascular coagulation (DIC) associated with placental abruption, three cases (8.57 %) were due to postpartum haemorrhage(PPH),

one case (2.8 %) was due to amniotic fluid embolism and one case (2.8 %) was due to pulmonary Tuberculosis. Among the seven postpartum deaths, three cases had moderate to severe anemia.

Among the two cases associated with DIC one of them was a 24 years old female. The patient had presented with complaints of pain, bleeding p/v, blurred vision and absent FHS (fetal heart sounds). On further examination patient was diagnosed as 39 weeks, 2 days gestational primi with single IUFD in breech with pre-eclampsia grade 3, placental abruption, oligo-hydramnious, severe anemia (Haemoglobin level=4gm/dl), thrombocytopenia and DIC in latent labour. USG revealed positive Spalding's sign. Patient was shifted to OT for emergency Lower Segment Cesarean Section. After extraction of dead fetus, Couvelaire uterus was noted and ligation of both internal iliac arteries were done intra operatively. Post op vitals of patient destabilised and she died in spite of adequate resuscitatory and anti-infective measures. Histopathology report shows featured of DIC with fibrin thrombi noted in the small vessels and thrombi within larger vessels and alveolar haemorrhage. Kidneys shows features of acute tubular injury and heart shows extravasation of RBCs in the pericardium. The second case with DIC was a 16 years old female with associated anaemia and placental abruption.

Out of the 3 cases with PPH, one of the case was that of a 27 years old female who had spontaneous rupture of membranes with dropping fetal heart rate hence patient was shifted for LSCS. A stillborn fetus was extracted however atonic Post-partum haemorrhage was noted for which unplanned hysterectomy was conducted. However, patient succumbed to shock and haemorrhage due to atonic PPH. Another case with PPH was that of a 20 years old female who after delivery of a live fetus expired due to shock and haemorrhage. The third case was a 33 years old female with complaints of low daily fetal movement count. On examination she was diagnosed to have IUFD. After extraction of dead fetus, she had bleeding p/v and was diagnosed to have PPH. She died due to shock and haemorrhageas a result of PPH.

The one case of amniotic fluid embolism was a 24 years old female who after delivering a live baby through normal vaginal delivery developed frothing at mouth, GTCS (generalized tonic – clonic seizures), bilateral crepitations over both lung fields, feeble pulse but died instantaneously inspite of adequate resuscitatory efforts. Histopathological examination revealed presence of amniotic fluid embolism.

The death due to respiratory failure was that of a 26 years old female P2L0/POD2 of hysterotomy had associated pulmonary tuberculosis with acute kidney injury and posterior reversible encephalopathy syndrome.

There was only one case of intrapartum death in our study which was due to rupture of uterus. She was a 34yrs old female hence was an elderly gravid with postdated pregnancy associated with severe anemia which was corrected with blood transfusion. She was induced for normal vaginal delivery however due to non progressive labour, LSCS was planned. However, convulsions developed before the planned LSCS and the blood pressure started to plummet. On opening the abdomen, rupture uterus was diagnosed hence hysterectomy was done. However, patient succumbed to hemorrhagic shock.

Autopsy and Histopathological Findings

Feature	No of Cases
Haemorrhage in genital tract	10
Diffuse Tubular necrosis of kidney	6
DIC	9
Shock Liver	7
Shock lung	4
Anaemia	10
Flabby uterus	5
Focal hepatic Necrosis	4
Mitral stenosis	1
Diffuse alveolar injury	2
Peritonitis	3
Elongated Skin epithelial cells ,vacuolization of epidermal and dermal cells	2
Varices at gastroesophageal junction	1
Retroplacental hematoma	2
Chorion cells, fat globules and fetal squames in pulmonary vessels	1
Scattered cavitations in lungs	1
Acute tubular necrosis of Kidney	3
Myometrium showing haemorrhage with extravasated RBCs and congestion	1

Discussion

Maternal deaths are a great tragedy for the family and the infant that becomes motherless. According to WHO, every day in 2000, almost 800 women died from preventable causes related to pregnancy and child birth. [4] Maternal mortality rate reflects the quality of obstetric care given to the patients as well as the policies adopted by the Government of that country.

Blood bank facilities, prompt transportation facilities, availability of adequately trained doctors and nurses and perception and economic status of the family of the pregnant women are some of the factors attributing to maternal morbidity and mortality.

Janani shishu Suraksha Karyakram is a central Government sponsored Program is running in states to increase institutional deliveries.[5]

Surveys in different parts of the country shows that about 50 – 60 % of women belonging to low socio economic groups are anaemic in the last trimester of their pregnancy. Anaemia is associated with high incidence of postpartum haemorrhage, puerperal sepsis and thromboembolic phenomenon. [6]

The pace of decline in maternal mortality has shown increasing trend from 4.1 % annual rate of decline during 2001 – 03 to 5.5 % in 2004 – 06 to 5.8 % in 2007 -09 and is maintained in the almost same level of 5.7 % in 2010 – 12. [7]

The SRS report has grouped into three categories. Category A includes states of Bihar, Jharkhand, Madya Pradesh, Orissa, Rajasthan, Uttarpradesh, Assam. These states have high mortality indicators. Category B includes southern states of Andhra Pradesh, Karnataka, Kerala and Tamil Nadu, these states have comparatively better health indicators. Category C includes remaining states.[6]

Some of the key indicators of maternal health such as antenatal checkup, institutional delivery, deliver by trained and skilled personnel, post natal care etc are regularly monitored through health management information system "(HMIS) and also periodically through District Level Household surveys (DLHS), National Family Health surveys (NFHS). Independent surveys are also done by Coverage Evaluation Surveys (CES) by UNICEF.[7]

All though, the cases of suicide due to burns or hanging doesn't fall under the definition of maternal deaths , these cases has been included in our study with the intention of highlighting the importance of other non-medical factors like support from family and spouse, addressing the anxiety, depression and other mental health issues that lead to perinatal deaths by suicide. In the present study, higher incidence of maternal deaths were seen in age group of 21 – 30 years ,which is in accordance with that observed by Patekar M B, Jagtap N S, Pawale D A.[8] 20 – 30 years of age is coinciding with the average time of having first child in Indian scenario. Similar Results were obtained in study conducted by Nootan Dayal, Anjali Srivastava[9]. Study conducted by A.N Kavatkar, N S Sahasrabudhe et al also found similar results.[10]

The mode of delivery was cesarian section in four (57 %) cases out of seven postpartum death cases. Among the seven postpartum deaths, three cases (42 %) had moderate to severe anaemia. The area of residence was urban in fifteen (42 %) and twenty (57 %) cases belonged to the rural area. This result is similar with that observed by the study conducted by Patekar MB, Jagtap N S, Pawale D. A [8]

Proportion of hypertensive disorders of pregnancy and child birth were related to (seven cases (20%) to the overall maternal mortality.

Death was due to sepsis in six cases (17 %), the causes that lead to sepsis being septic abortion, intra uterine fetal death, postpartum haemorrhage, tuberculosis and burn injuries.

Conclusion

Ensuring that all mothers have access to the high quality maternal care is of crucial importance to the development of the country as a whole. Maternal health encompasses Family planning, preconceptional, prenatal and postnatal care. [11]

Fourteen cases that were due to suicide highlights the importance of universal screening for suicidal tendencies and for anxiety and depression for all the pregnant women as part of the routine antenatal investigations. Doctors must be vigilant for the risk of suicide especially in pregnant women with a pre-existing psychiatric illness or history of suicide attempt. The significant number of suicides committed by women in our study highlights that there is an urgent need to address the psychiatric issues experienced by pregnant and puerperal women. This could be anxiety, depression, postpartum blues etc which may be undiagnosed in early phase of pregnancy or underestimated by the caretakers of the woman. If proper medical aid was been provided at the right time, such unfortunate incidents could have been avoided. This also highlight the inadequacy of

emotional support from family members including the spouse.

Many of the maternal deaths could have been prevented if there was no delay in the diagnosis and treatment given. The primary health care should be strengthened enough to screen the risk factors at an earlier stage of pregnancy. Adequate number of Doctors and other health care staff who are well trained must be posted in peripheral health care institutions. It has also been concluded through our study that many cases were referred to higher centres only after some severe complications have developed or at a very critical stage of the pregnant and childbirth. In the case of intrapartum rupture of uterus, the family waited for normal vaginal delivery as they were hesitant for ceasarian section. It has also been found out in the study that even in this time, prompt identification and treatment of ectopic pregnancy is not done.

Management of third stage of labour and postpartum haemorrhage requires great expertise in obstetric care. For the successful prevention of death in such cases needs detecting the risk factors early, timely diagnosis and management. Many of the women who died were suffering from anaemia. Even after routine haemoglobin checkups been done during antenatal visits and prescription of iron tablets to all pregnant women, we were not able to raise the haemoglobin levels. This could be due to non- compliance to treatment by the patient as well as unawareness of the hazards due to iron deficiency.

Reducing the patriarchal decisions involved in the family planning and post-delivery care of women, providing nutrition that is adequate to meet the needs of a pregnant women, better access to the health facilities by mothers belonging to disadvantaged and vulnerable groups of the society along with continuing the support to uplift the educational status of women should be done to fulfil our long term dream of uneventful, positive and healthy maternal health care in our country.

References

1. Special bulletin on maternal mortality in India 2018 – 20,sample Registration system,[internet] available from: https://censusindia.gov.in/ nada/index.php/ catalog/44379/download/48052/SRS_MMR_Bulletin_2018-2020.pdf
2. PMSMA:Pradhan Mantri Surakshuit Matritva Abhiyan [intermet]. Available from : https:// pmsma.mohfw.gov.in/
3. DC Dutta. Normal puerperium. DC Dutta's Textbook of Obstetrics. 8 th edition, Jaypee Brothers Medical Publishers; Nov 2015. Chapter 14,p.168.
4. Maternal mortality. Available from: [internet]https:// www.who.int/news-room /fact- sheets/ details/ maternal - mortality
5. Banasree Bhadra, Ronita Rouy, Choudhury, Suvobrata Sarkar, Dhrubajyoti Sarkar, Journal Of Family Medicine and Primary Care, 2017 April vol 6 (2): 270 – 273
6. K. Park, Park's Preventive&Social medicine textbook, 23rd edition, Banarsidas Bhanot Publishers; p560-563.
7. Maternal health Programme, Annual Report 2013-2014, Chapter 4.[internet] Available from. https:// main.mohfw.gov.in/sites/default/files/chapter415.pdf.
8. Patekar M B, Jagtap N S, Pawale D A ,Perspective of maternal deaths : A Retrospective Autopsy Study. Indian Journal of Forensic Medicine and Toxicology, July – September;2020; Vol 14:No.3

9. Nootal Dayal, Anjali Srivastava, A retrospective study of maternal mortality in a tertiary care hospital. IOSR J Dent Med Sci.2019;18:15-8.
10. A N Kavatkar, N.S Sahasrabudhe, M V Jadhav, S D Deshmukh, Autopsy study of maternal deaths. International Journal of gynecology and Obstetric, 81 (2003); 1-8.
11. https:// en.m. Wikipedia .org/wiki/maternal health