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Original Research Article

An Autopsy Study of Maternal Mortality at Tertiary Care Centre at Kolhapur

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Article Info

Key words

Maternal death,
Medicolegal autopsy,
Direct causes,
Indirect causes,
Hemorrhage.

Abstract

Prevailing high maternal morbidity and mortality has always been source of concern and antenatal and intrapartum care aimed at reducing maternal morbidity and mortality have been components of the Family Welfare programme since inception. The major causes of maternal mortality continue to be unsafe abortions, ante and post-partum haemorrhage, anaemia, obstructed labour, hypertensive disorders and post-partum sepsis. Inadequate coverage, lack of training of health personnel in antenatal screening, risk identification and referral, had led to hindrance towards the reduction of maternal mortality. In this study we have retrospectively analysed the autopsy cases concerning the maternal mortality in the period between 2015 to 2018 referred to Rajarshree Chhatrapati Shahu Maharaj, Government Medical College & CPR hospital, Kolhapur, Maharashtra. Total 60 cases of maternal deaths which were brought for autopsy were studied during period of January 2015 to December 2018.

1. Introduction

Although pregnancy is considered as a physiological process in developed nations, for women from developing and underdeveloped countries it is a life threatening event. World wide about 830 women die every day of preventable causes related to pregnancy and childbirth, 20 % are from India.¹

Maternal mortality is defined as “ The death of a woman while pregnant or within 42 days of termination of pregnancy (delivery

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.²

Delivery includes miscarriages, abortions (spontaneous, legal and illegal), live or stillbirths, vaginal or cesarean deliveries.³WHO classifies maternal

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maternal deaths causes into four groups: 1) Direct 2) Indirect 3) late due to unanticipated complications of management, and 4) fortuitous deaths.²

- 1) Direct causes: The death is directly related to obstetric complications of pregnancy (pregnancy, delivery or puerperium); from interventions, omissions or treatment, or from chain of events resulting from any one of these.
- 2) Indirect causes: The death occurs as a consequence of the pregnancy exacerbating a pre-existing medical condition, or medical condition developing in pregnancy, but not directly attributable to the existing pregnancy, although the physiologic effects of pregnancy are partially responsible for the death.
- 3) Late death: The death occurring between 42 days and 1 year post-delivery from the conditions that are due to direct or indirect causes.
- 4) Accidental, incidental or fortuitous death: Death due to causes unrelated to pregnancy, delivery or puerperium. This many result from the accidental events (for eg. Vehicular accidents) or incidental causes (eg. Swine flu).⁴

Maternal mortality rate: The number of maternal deaths in a population divided by the number of women of reproductive age (15-49), usually expressed per 1,00,000 women of reproductive age per year. In India, it is about 120 as compared to 0.5 in the US.⁵The various causes of maternal deaths may be a combination of direct and indirect causes, and the deaths may be multifactorial.

Objectives:

1. To know the causes of maternal death subjected to postmortem examination.
2. To classify the causes according to groups.
3. To suggest measures to prevent maternal deaths.

2. Material & methods:

A total of 60 cases of maternal death which underwent medico-legal postmortem examination in the period of 4 year 2015 to 2018 were studied at the Department of forensic medicine and toxicology, Rajarshi Chhatrapati Shahu Maharaj Government medical college, Kolhapur, Maharashtra. All the autopsies in maternal death were performed by a team of forensic expert,

pathologist and a gynecologist, after an inquest along with the clinical papers were received for the same. The study includes cases of maternal deaths which were treated at the same institute, along with cases referred from private hospitals, peripheral government hospitals, remote areas, and the cases which were brought dead at the hospitals. Cases from the year 2015 to 2017 were studied retrospectively after detail analysis of the postmortem reports, inquest papers and histopathology reports, while cases from the year 2018 were studied prospectively.

3. Results:

It is observed from this study that out of the 60 cases of maternal mortality brought for autopsy in the period of 2015 to 2018, maximum number of maternal deaths were seen in age group of 20 to 29 years comprising 40 (66.4%) and 12(19.92%) cases were found in the age group 30 to 34 years of age. Only 3 cases belong to the age category below 20 years and 5 cases above the age 35 years (Refer to **table no. 1**).

Table no. 1 distribution of cases as per age groups

Age wise distribution %	Present study	Thomas et al	Kuralkar et al	Mukherjee et al	Soni et al	Patil et al
<20	3(5%)	3.1%	7.4%	10%	21.5%	7.94%
20-29	40 (66.4%)	70.8%	73.7%	68%	65.5%	74.6%
30-34	12(19.92%)	16.9%	11.6%	18%	7.53%	15.1%
>35	5(8.3%)	9.2%	7.4%	4%	2.15%	2.34%

Table no. 2 distribution of cases as per residence (urban/rural)

Urban/Rural	Present study	Kuralkar et al	Soni et al	Bangal et al	Patil et al
Urban (%)	16.6	61.1	36	1.8	61.9
Rural (%)	83.4	38.9	64	98.2	38.1

Maximum cases 50 (83.4%) were residing in rural area where as rest 10 cases (16.6 %) belonged to urban area. Most cases (30) of maternal mortality were referred for autopsy from the government hospitals including the present institute where the study was conducted, while 24 cases were from the

private hospitals, and 6 cases were directly brought as dead to the casualty (Refer to [table no.2](#)).

Table no. 3 Distribution of cases as causes of maternal death and their percentage

Causes	Number of cases with percentage		
	Present study	Thomas et al	Kuralkar et al
Direct maternal deaths	48 (80%)	39 (60%)	85 (89.4%)
Indirect maternal deaths	11 (18.3%)	24 (37%)	10 (10.5%)
Undetected deaths	0 (0%)	2(3%)	0 (0%)
Incidental causes	1 (1.66%)	0	0 (0%)

Most of the cases (32) were with full term gestation while only 2 cases belonged to the first trimester. Death occurring in the 3rd trimester were the second most with 18 no. of cases. 24 cases of maternal mortality were primigravida, while 18 cases were of second gravida and least no. of cases belonged to the 4th gravida and above.

Table no. 4 Distribution of cases as causes (direct/indirect)

Causes of death		No. of cases.
Direct causes	Hemorrhage	22 (36.66 %)
	Sepsis/ Respiratory causes	14 (23.33%)
	DIC/PIH/HELLP syndrome/ anemia	12(20%)
Indirect causes		11(18.3%)
Incidental		1(1.66%)

Most of the causes of death found during autopsy were direct causes, of which hemorrhage was the leading cause (22 no. of cases) followed by the respiratory causes and respiratory causes. 11 cases of maternal death were having indirect causes while only one case had incidental cause of death

4. Discussion:

Most maternal deaths occur in underdeveloped and even developing countries like India and are bundled around delivery and the immediate post-partum period, although there are variations depending upon the population. Maternal mortality reduction has been the topmost priority for the international community. The Millennium Development Goals⁶ and the WHO 'Make every mother and child count' Initiative⁷ describe the importance of maternal mortality reduction as a healthcare issue. A recent systematic review of the causes of maternal mortality and its geographic distribution has shown that the Indian

subcontinent has a significantly higher maternal mortality attributable to sepsis, infection and hemorrhage.⁸ Though maternal mortality has been the subject of a number of studies in India, very few detailed autopsy studies have been reported. A comprehensive summary of the magnitude and distribution of the causes of maternal deaths is critical to reform reproductive health policies. With this view we conducted the study based on the medicolegal autopsy done in cases of maternal deaths during the period of 2015 to 2018 at RCSM GMC Kolhapur.

In the present study, higher incidence of maternal deaths 40 (66.4%) in the age group 20 to 30 years is in accordance with that observed by Thomas et al⁹, Kuralkar et al¹⁰, Mukherjee et al¹¹, Soni et al¹², Patil et al¹³. Greater incidences of maternal deaths in the group of 20 to 30 years in the present study may be attributed to the common tradition of marriages in the early 20's and early pregnancy, especially in the rural areas.

In the present study, 16.6 % females were residing in urban area and rest 83.4 % in rural areas. The predominance of rural area in maternal death was in consistency with the observations of Soni et al¹² and Bangal et al.¹⁴ However, these results are in contrast with that observed by Kuralkar et al¹⁰ and Patil et al¹³ who noted maximum maternal deaths in urban locality. Majority of the women in rural area belong to lesser awareness about the healthcare to be taken during maternity, with fewer ANC visits and poverty causing more no. of deaths during the pregnancy and labour. Also distant health facilities at the rural areas in the vicinity of this region also may be responsible for the predominance of maternal deaths in females residing at rural areas.

A retrospective autopsy study of all cases of maternal deaths that underwent a medicolegal autopsy at this tertiary health centre from January 2015 to December 2018 where a total of 60 cases were autopsied, we found that in the autopsy cases most common causes of maternal mortality were due to direct causes i.e 80 % , among them hemorrhagic shock (36.66 %) was the most common. It was followed by septicemia (14 %) and disseminated intravascular coagulation due to pregnancy induced hypertension, anemia (12%). Indirect causes followed the direct causes which was 18.33 % which included death causes like

kidney infections, pneumonia, anemia, subarachnoid hemorrhage, hepatitis, etc. Only one incidental cause of death due to swine flu infection was observed in the study.

Predominance of deaths due to direct causes over the indirect causes was consistent with the observations by Thomas et al (60% direct causes over 37 % indirect causes)⁹ and by Kuralkar et al (89.4% direct causes over 10.5 % indirect causes).¹⁰ In both the studies it was observed that hemorrhage alone was most common cause of death in direct causes, which was followed by pregnancy induced hypertension.

In the current study, where hemorrhage was the leading cause, 3 cases died of hemorrhagic shock due to uterine rupture, 2 cases due to vaginal and cervical tears, 3 cases due to placental separations and abruption. One death was related to hemorrhage following lower segment caesarean section.

Most of the direct causes of deaths were from the rural areas which were either brought in dead or referred from primary health centres and rural hospitals with insufficient management to prevent the morbidity. Rural women face a series of restrictions that prevent necessary care leading to higher risks during pregnancy and birth. In study by Bangal et al¹⁴, it was observed that significant number of cases (46.42%) had one or the other form of delay in seeking or receiving care before death of which thirty-eight cases out of 56 had avoidable factors. In twenty-six cases there was delay in decision making to seek care. Eight deaths were seen due to delay in reaching care, mainly due to lack of transport facilities.

5. Conclusion:

The facility of health care at the terminal end of our health provisioning system in the rural are as urgently requires a headstrong political drive to improve the present situation. In addition, lack of acceptable referral facilities to provide emergency obstetric care for complicated cases also subsidize to high maternal mortality rate.

To lower maternal mortality following steps must be taken into consideration: -

1. Early registration and mandatory four antenatal check-ups

2. Dietary supplementation, including correction of hemoglobin
3. Early diagnosis of pregnancy induced hypertension.
4. Prevention of hemorrhage during delivery, puerperium
5. Promotion of institutional deliveries for women with bad obstetric history and risk factors
6. Identification of every maternal death and searching for its cause through autopsy
7. Provision of safe abortion services
8. Analysis of every maternal death through maternal death audit.

To conclude, it should always be remembered that Maternal mortality, even today, is a preventable tragedy.

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