

Trends in Maternal Mortality in a Tertiary Care Centre Over a Period of 5 Years - A Retrospective Analysis

Ramaraju H E¹, Sachin Harkude², Karunya N³, Sharanya V⁴

¹Associate Professor, Department of OBG, VIMS, Ballari, Karnataka, India
Email: [drramaraju678\[at\]gmail.com](mailto:drramaraju678[at]gmail.com)
Mobile: 70190 34104

²Junior Resident, Department of OBG, VIMS, Ballari, Karnataka, India
Email: [sachinharkude.963\[at\]gmail.com](mailto:sachinharkude.963[at]gmail.com)
Mobile: 94823 34782

³Junior Resident, Department of OBG, VIMS, Ballari, Karnataka, India
Email: [karu1695\[at\]gmail.com](mailto:karu1695[at]gmail.com)
Mobile: 99649 29703

⁴Junior Resident, Department of OBG, VIMS, Ballari, Karnataka, India
Corresponding Author Email: [v.sharanya067\[at\]gmail.com](mailto:v.sharanya067[at]gmail.com)
Mobile: 94485 47129

Abstract: Introduction: Knowing epidemiological factors, causes and complications leading to maternal death is very important to design interventional programs to reduce MMR. Prevention and early diagnosis of complications is more important in prevention of MMR. Aims and Objectives: Analysis of trends and causes of maternal mortality in a tertiary care centre. Materials and Methods: The present retrospective hospital-based study was conducted in the Department of OBG, VIMS, Ballari from January 2017 to December 2021. The information regarding epidemiological data including cause of death will be collected from the MRD of the hospital. Results: Total of 211 maternal deaths were studied and analyzed. Most of the maternal deaths occurred in age group 20-24 years (49.2%), with no much difference between parity. Maximum patients are of rural origin (83.4%). Most patients died postnatally (84.3%) as compared to Antenatal (14.7%) and postabortal (0.9%) periods. Majority of the patients died within 24 hours of admission. 62.08% of cases were referred. Direct causes accounted for 70% of maternal deaths where as indirect causes accounted for 30% of maternal deaths. Conclusion: Even today most maternal deaths are seen in patients from rural areas. HDP, sepsis and Hemorrhage are the major causes of maternal deaths. Improvement in primary health care in rural areas and proper implementation of NRHM programs, early referral and up gradation of hospitals in rural areas can definitely bring down the number of maternal deaths. Identification of high risk pregnancies and early intervention including for complications can reduce the MMR significantly.

Keywords: MMR - Maternal Mortality Rate, NRHM, WHO, SDG, NMTP

1. Introduction

Maternal mortality is an indicator of quality of obstetric care in a community, directly reflecting the utilization of health-care services available.

In the context of the Sustainable Development Goals (SDGs), countries have united behind the target to accelerate the decline of maternal mortality by 2030. SDG 3 includes an ambitious target: "reducing the global MMR to less than 70 per 100000 births, with no country having a maternal mortality rate of more than twice the global average". The government of India is a signatory to the United Nations (UN) Sustainable Development Goals (SDGs), which adopted a global maternal mortality ratio (MMR) target of fewer than 70 deaths per 100000 live births by 2030².

The high number of maternal deaths in some areas reflects inequalities in access to quality health services. India contributes to one-fifth to the global maternal mortality¹. The MMR declined in India by about 70% from 398/100000live births in1997-98 to 99/100000 in 2020. About 1.30 million maternal deaths occurred between 1997-

2020, with about 23800 in 2020, with most occurring among women aged 20-29 years.²

Maternal mortality is ascribed usually to complications that generally occur during or around labor and cannot be accurately predicted¹. The direct causes of maternal mortality, that is, hemorrhage, unsafe abortion, eclampsia, obstructed labor, infection, and others account for about three-fourths of maternal deaths. The remaining one fourth are indirect causes such as anemia, hepatitis, heart disease, malaria, and human immunodeficiency virus (HIV)/acquired immunodeficiency syndrome (AIDS)¹.

Here in our study we evaluate the trends of maternal mortality over a 5 year period in a tertiary health care centre examining 211 maternal deaths.

2. Objectives

Analysis of trends and causes of maternal mortality in VIMS over 5 years.

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3. Methods

Data Source and Design

We applied the WHO definition of maternal death, i.e. the death of a woman while pregnant or within 42 days of terminating a pregnancy, irrespective of the site and duration of pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes.

The present study is a retrospective study conducted in the department of Obstetrics and Gynecology, Vijayanagara Institute of Medical Sciences, Ballari from January 2017 to December 2021. The information regarding demographic profile, reproductive profile, etiological profile (cause of death), and time interval from admission to maternal death was collected from the MRD of the hospital. There were total of 211 maternal deaths in the study period which was carefully studied and analyzed.

4. Results

The epidemiological characteristics of maternal deaths are shown in Table 1

Table I: Age group and maternal death

Age (years)	Number	Percentage
<20	14	6.63%
20-24	104	49.2%
25-29	73	34.5%
30-34	14	6.6%
>35	6	2.8%
Total	211	100%

Maximum maternal deaths were noted in the age group 20-24 years i.e. 49.2%.

Table II: Relationship between mortality and gravida para status

Parity	Number	Percentage
Primiparous	108	51.1%
Multiparous	103	48.8%
Total	211	100%

No much difference was observed between Primiparous and multiparous.

Table III: Residency wise distribution

Residence	Number	Percentage
Urban	35	16.5%
Rural	176	83.4%
Total	211	100%

Maximum maternal deaths were reported in women from rural areas accounting for 83.4% as compared to women from urban areas (16.5%).

Table IV: Time of death

	Number	Percentage
Antenatal	31	14.6%
Postnatal	178	84.3%
Postabortal	2	0.9%
Total	211	100%

Most patients died postnatally (84.3%) as compared to Antenatal (14.6%) and postabortal (0.9%) period.

Table V: Admission to death interval

Interval	Number of cases	Percentage
<24 hours	103	48.8%
24 hours to 7 days	91	43.1%
>7 days	18	8.5%
Total	211	100%

Majority of the patients (48.8%) died within 24 hours of admission

Table VI: Referred cases

	Number	Percentage
Referred	131	62%
Not referred	80	38%
Total	211	100%

62% of total cases were referred

Table VII: Year wise distribution of deliveries and maternal deaths (N=211)

Year	Deliveries	Maternal deaths	MMR/1, 00, 000 births
2017	7053	53	751
2018	8826	25	283
2019	8529	46	539
2020	8594	40	465
2021	8842	47	531
Total	41844	211	504

Table VIII: Distribution of Direct and Indirect causes (N=211)

	Number of cases	Percentage
Direct causes		
HDP	57	27%
Hemorrhage	42	20%
Sepsis	23	11%
Embolism	23	11%
Uterine rupture	2	1%
Indirect causes		
Anemia	17	8%
Jaundice	5	2%
Heart diseases	19	9%
Others	23	11%
Total	211	100%

During the study period 70% of maternal deaths were due to direct causes. Among which death due to HDP was 27%, Hemorrhage was 20%. Other causes include Sepsis (11%), Embolism (11%) and uterine rupture (1%) Indirect causes accounted for 30% of maternal deaths Anemia (8%), Jaundice (2%), Heart diseases (9%) and others 11%.

5. Discussion

Maternal mortality is the index of reproductive health of the society. High incidence of maternal deaths reflects poor quality of maternal services, late referral and low socio-economical status. Our study tells about the trends and causes of maternal deaths in a tertiary care centre.

In our study total of 211 maternal deaths were studied and analyzed. Most of the maternal deaths occurred in age group 20-24 years (49.2%), with no much difference between

parity. Maximum patients are of rural origin (83.4%). Most patients died postnatally (84.3%) as compared to Antenatal (14.7%) and postabortal (0.9%) periods. Majority of the patients died within 24 hours of admission. 62.08% of cases were referred. Direct causes accounted for 70% of maternal deaths where as indirect causes accounted for 30% of maternal deaths.

Large number of maternal deaths is due to the classical triad of hemorrhage, sepsis, and eclampsia which are the preventable causes of death. To avoid maternal deaths it is vital to prevent unintended pregnancies. All women, including adolescents, need access to contraception, safe abortion services and quality post abortal care. All women need access to high quality care in pregnancy, and during and after childbirth. It is particularly important that all the births to be attended by skilled health professionals, as timely referral, management and treatment can make the difference between life and death for the women.

As seen in our study 83.4% cases were from rural areas, 62% cases were referred and 48.8% patients died within 24 hours of admission. It implies that there is acute shortage of health care at primary level. To fill this gap Ministry of HFW has started National Midwifery Training Program from January 2023. Our study can act as a baseline to know the impact NMTP will have in the coming years.

By implementing WHO's strategies towards Ending Preventable Maternal Mortality (EPMM) and by implementing programmes of National Rural Health Mission (NRHM) by advocating institutional deliveries and timely referral of high risk cases can reduce the preventable causes of maternal mortality.

6. Conclusions

- 1) Even today most maternal deaths are seen in patients from rural areas.
- 2) HDP and Hemorrhage are the major causes of maternal deaths.
- 3) Implementing WHO's strategies towards Ending Preventable Maternal Mortality (EPMM) and by implementing programmes of National Rural Health Mission (NRHM) by advocating institutional deliveries, strengthening the primary health centres, first referral units, early detection and timely referral of high risk cases can reduce the number of maternal deaths.
- 4) National Midwifery training Programme started in January 2023 can be helpful achieving the same. Identification of high risk pregnancies and early intervention including for complications can reduce the MMR significantly

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