



ASSESSMENT OF MATERNAL MORTALITY DEATH REVIEW AT TERTIARY HOSPITAL:(2019-2022) A RETROSPECTIVE ANALYSIS

Obstetrics & Gynecology

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ABSTRACT

Introduction: Maternal mortality remains the leading cause of death and disability for reproductive age women. India contributes 1/5 of global burden of absolute maternal death however it has experienced on estimated 4.7% annual decline in maternal mortality ratio and 3.5% annual increase in skilled birth attendance since 1990 while on track to meet millennium development goal no.5. Within India there is marked variation in MMR and healthcare access between regions and in socioeconomic factors understanding the distribution related to cause specific mortality and access to obstetric service indicator essential to improve maternal health. **Aim:** To evaluate and assess causes of maternal mortality and measures to reduce it. **Method:** A retrospective study done at tertiary level care center from June 2019-May 2022. Data were collected from death review form, case-records studied and analyzed. **Results:** Total of 72.6% of deaths were due to direct causes with eclampsia and associated hypertensive disorders being the most common cause followed by Anemia as the most important indirect cause. Others include ARDS, sepsis, hepatitis, cardiovascular diseases, amniotic fluid embolism, aspiration pneumonitis, and diabetic ketoacidosis. **Conclusion:** Strengthening health system to collect high quality data in order to respond to needs and priorities of women. Early referral, easy transport, continued skill-based training, special training is required for ASHA and ANM worker and medical officers working at PHC, early recognition of high - risk women and their timely referral and management is highly required.

KEYWORDS

INTRODUCTION

Maternal mortality is among the most important public health concerns world-wide globally, in 2015 MMR was estimated as 216/1 lac. live birth. According to ICD 10, WHO defines maternal death as: The death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of 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. According to the United Nations Population Fund (UNFPA) estimated that 303,000 women died of pregnancy or childbirth related causes in 2015 and according to 2017 report, about every 2 minutes a woman dies because of complications due to child birth or pregnancy. For every woman who dies, there are about 20 to 30 women who experience injury, infection, or other birth or pregnancy related complication.^{1,6}

Maternal mortality was subject of united nation 5 millennium development goals (MDG) which was to reduce MMR by $\frac{3}{4}$ from 1990-2015. According to sustainable development goal (SDG) 3.1 countries are required to reduce there MMR to less than 70 death/ 1 lacs live birth by 2030.

India's MMR in 2016-2018 was 113/1,00,000 live birth. It accounts for 15% of global deaths and according to SRS (sample registration system) reports that MMR from 2014-2016 of Madhya-Pradesh is 173/1,00,000 live birth and stands on 3 position in maternal mortality after Assam and Uttar-Pradesh from last 2 decades.¹

WHO divides causes of maternal deaths in 2 categories and direct obstetric and indirect obstetric causes.

Direct obstetric cause of deaths are those resulting from obstetric complication of present pregnancy, labor, or puerperium which includes hypertensive disorder of pregnancy, hemorrhage, sepsis, obstructed labor which are responsible for about $\frac{3}{4}$ maternal deaths worldwide where-as Indirect cause of obstetric deaths are the pre-existing condition, developed during pregnancy or aggravated by physiological effects of pregnancy which interfere or worsen the existing condition, like anemia which is the most important and preventable indirect cause others are heart disease, hepatitis, diabetes, malaria, tuberculosis, epilepsy etc.^{1,3}

Overall, maternal mortality is an important marker of the overall health of the country and reflects on its health infrastructure. Lowering the

amount of maternal death is an important goal of many health organizations world-wide. Maternal mortality is just a tip of ice-berg, behind each mortality there are at-least 20 mothers who experiences severe morbidity. Although much research has been conducted; knowing the patterns and risk factors associated with maternal mortality in developing country helps to target scarce resources and intervention program to high risk areas for the greatest impact⁴

This study was carried out at Sanjay Gandhi govt. hospital, Rewa, Madhya-Pradesh a tertiary center where large no. of patients are referred from different district, sub-district, PHC and other parts of rural areas as well as urban areas. This study was done to analyze causes of maternal deaths, factors responsible for death, so early that intervention can be done to prevent and reduce the no. of maternal deaths.

OBJECTIVE

1. To assess the causes and factors associated with maternal mortality.
2. To suggest the measures to reduce MMR.

METHODS

This is a retrospective study carried out at Sanjay Gandhi government hospital, Rewa, Madhya Pradesh, a tertiary health care center. Demographic and other data were collected from individual case records and maternal death review forms of past 3 years from 2019 (June) – 2022 (may).

Inclusion criteria-

deaths during pregnancy, delivery or with-in 42 days of termination of pregnancy irrespective of site and duration of pregnancy due to cause related or aggravated by pregnancy or its management.

Exclusion criteria-

1. maternal deaths after 42 days of delivery
2. suicidal, incidental and accidental causes of deaths
3. women who died without being pregnant

Total 200 maternal deaths were carefully studied and analyzed.

RESULT

It is observed that a majority of patients died 154 (77%) belongs to rural area and 46 (23%) from urban areas. Most of the patients were

referred from are as 82 (41%) from district hospitals (D.H.), 46 (23%) from community health centers (C.H.C.), 31 (15.5%) from primary health care (P.H.C.), and 9 (4.5%) from private hospitals.

Most of the deaths 101 (50.5%) occurred from age group (25-30) year, 73 (36.5%) from age group (18-24) year, 23 (11.5%) from age group (31-35) year, 2 (1%) from age group (36-40) year and 1 (0.5%) from more than 40 years 110 (55%) patients have less than 3 ANC visits, 50 (25%) patients were with 0 ANC visits (even without basic investigations) and 40 (20%) patients were with 3 more than 3 ANC visits.

Sociodemographic characteristics	Cases	Percentage
Area of residence		
Rural	154	77%
Urban	46	23%
Patients referred from		
D.H.	82	41%
C.H.C	46	23%
P.H.C	31	15.5%
Private	9	4.5%
Age group		
18-24yr	73	36.5%
25-30yr	101	50.5%
31-35yr	23	11.5%
36-40yr	2	1%
>40yr	1	0.5%
No. of ANC visits		
Nil	50	25%
< 3	110	55%
=>3	40	20%

In the following data 41 (20.5%) patients died during antepartum period and 159 (79.5%) during postpartum period. With 91 (45.5%) died with 0 parity, 83 (41.5%) deaths were having parity between 1 to 4 and 26 (13%) were grand multi-para with parity equals to 5 or more.

Unfolding the mode of delivery data, most of the patients died had vaginal delivery that is 69 (34.5%), 49 (26.5%) had caesarean delivery, 5 (2.5%) underwent exploratory laparotomy with caesarean hysterectomy, and 41 (20.5%) were un-delivered. Among them 72 (59.01%) have live births and 44 (36.06%) were IUFD.

Timing of death	Cases	Percentage
Antepartum	41	20.5%
Postpartum	159	79.5%
Parity	Cases	Percentage
Parity -0	91	45.5%
parity 1-4	83	41.5%
parity =>5	26	13%
Mode of delivery		
vaginally delivered	87	43.5%
Caesarean section	67	33.5%
Exploratory laparotomy with Caesarean hysterectomy	5	2.5%
Un- delivered	41	20.5%
Outcome of delivery		
Live birth	72	59.01%
IUD	44	36.06%

In the study a total 145 (75.5%) deaths were due to direct obstetric causes among these direct causes hypertensive disorders of pregnancy accounts the most 66 (33%) and includes ante-partum eclampsia 32(16%), post-partum eclampsia 20 (10%), severe pre-eclampsia 14 (7%). About 29 (14.5%) died due to PPH, 23 (11.5%) from sepsis, 11(5.5%) due to abortion, 10 (5%) from obstructed labor/ rupture uterus and 5 (2.5%) from APH, and least 1 (0.5%) from amniotic fluid embolism.

Indirect obstetric cause of death holds 55 (27.5%) of total deaths in which anemia being the most important indirect cause accounts a total of 38 (19%) deaths, 8 (4%) deaths from heart disease and associated conditions, 6 (3%) from hepatic encephalopathy, and 1 (0.5%) from pulmonary embolism, aspiration pneumonitis and diabetic ketoacidosis each.

Cause of deaths	Cases	Percentage
Direct causes		
Abortion	11	5.5%
APH	5	2.5%
Obstructed labour / rupture uterus	10	5%
PPH	29	14.5%
Hypertensive disorder of pregnancy		
Severe Pre-eclampsia	14	7%
Ante-partum eclampsia	32	16%
Post-partum eclampsia	20	10%
Sepsis	23	11.5%
Amniotic fluid embolism	1	0.5%
Indirect causes		
Anemia	38	19%
Heart disease	8	4%
Hepatic encephalopathy	6	3%
Pulmonary embolism	1	0.5%
Aspiration pneumonitis	1	0.5%
Diabetic ketoacidosis	1	0.5%

Maximum patients 95 (47.5%) in our study died in less than 24 hrs. or less and about 61 (30.5%) died between 1-3 days and 44 (22%) patients died after 4 or more days.

Admission-death interval duration	Cases	Percentage
< 1 day	95	47.5%
1-3 days	61	30.5%
>= 4 days	44	22%

DISCUSSION

Maternal mortality is an index of reproductive health of the society. High incidence of maternal deaths reflects poor quality of maternal services, late referral and low socioeconomic status of community. This study has comparatively high MMR which could be due to the fact, that our hospital is a tertiary care centre and receives a lot of complicated referrals from other rural urban areas at a very late stage.⁵

Even today a large no. of maternal deaths is due to the classical triad of haemorrhage, sepsis, eclampsia. All these are preventable causes of maternal mortality provided the treatment started at time. Unfortunately, in many cases, patients were referred from nearby healthcare very late, in critical condition, unaccompanied by health worker.¹⁵ Most of the deaths are preventable if patients are given appropriate treatment at periphery and timely referral to higher centre health education of pregnant mothers and community about warning signs, training of ASHA workers, training of medical officers and staff nurses working in rural areas.

As most of the maternal deaths were within 24 hr or less these can be prevented by improving health care facilities in rural areas by ensuring round a clock availability of certain drugs such as injection magnesium sulphate, tablet misoprostol, tablet labetalol, tablet tranexa as most of maternal deaths in rural areas are still due to eclampsia and post-partum haemorrhage.²

Early detection of high risk cases and timely referral of these patients at tertiary care centre, promoting 100% institutional delivery, improving transportation, skilled manpower at every level can help in reducing maternal mortality rates.^{2,3}

CONCLUSION

In the context of the Sustainable Development Goals (SDG), countries have united behind a new 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 100 000 births, with no country having a maternal mortality rate of more than twice the global average".

Four elements are essential to maternal death prevention. First, prenatal care. It is recommended that expectant mothers receive at least four antenatal visits to check and monitor the health of mother and baby. Second, skilled birth attendance with emergency backup such as doctors, nurses and midwives who have the skills to manage normal deliveries and recognize the onset of complications. Third, emergency obstetric care to address the major causes of maternal death which are haemorrhage, sepsis, unsafe abortion, hypertensive disorders and obstructed labour. Lastly, postnatal care which is the six weeks following delivery. During this time bleeding, sepsis and hypertensive

disorders can occur and new-borns are extremely vulnerable in the immediate aftermath of birth. Therefore, follow-up visits by a health worker is assess the health of both mother and child in the postnatal period is strongly recommended.^{2,4}

Family planning has been reported to be a significant factor in maternal health. Governments should invest in their national healthcare to ensure that all women are aware of birth control methods. The government, through the ministry of health, should liaise with the private healthcare as well as the public healthcare division to ensure that women are educated and encouraged to use the right family planning method. The government should invest in this operation as when the rate of underage, as well as unplanned pregnancies, are reduced the healthcare cost stand a chance to drop by up to 8%. Healthcare will, therefore, be in a position to handle the other women who give birth. This will result in an improvement in maternal health.^{5,6}

REFERENCES

1. Meh C, Sharma A, Ram U, Fadel S, Correa N, Snelgrove JW, Shah P, Begum R, Shah M, Hana T, Fu SH. Trends in maternal mortality in India over two decades in nationally representative surveys. *BJOG: An International Journal of Obstetrics & Gynaecology*. 2022 Mar;129(4):550-61.
2. Kassebaum NJ, Barber RM, Bhutta ZA, Dandona L, Gething PW, Hay SI, Kinfu Y, Larson HJ, Liang X, Lim SS, Lopez AD. Global, regional, and national levels of maternal mortality, 1990–2015: a systematic analysis for the Global Burden of Disease Study 2015. *The Lancet*. 2016 Oct 8;388(10053):1775-812.
3. Alkema L, Chou D, Hogan D, Zhang S, Moller AB, Gemmill A, Fat DM, Boerma T, Temmerman M, Mathers C, Say L. Global, regional, and national levels and trends in maternal mortality between 1990 and 2015, with scenario-based projections to 2030: a systematic analysis by the UN Maternal Mortality Estimation Inter-Agency Group. *The lancet*. 2016 Jan 30;387(10017):462-74.
4. Bullough C, Meda N, Makowiecka K, Ronsmans C, Achadi EL, Hussein J. Current strategies for the reduction of maternal mortality. *BJOG: An International Journal of Obstetrics & Gynaecology*. 2005 Sep;112(9):1180-8.
5. Sitaula S, Basnet T, Agrawal A, Manandhar T, Das D, Shrestha P. Prevalence and risk factors for maternal mortality at a tertiary care centre in Eastern Nepal-retrospective cross sectional study. *BMC Pregnancy and Childbirth*. 2021 Dec;21:1-8.
6. Montgomery AL, Ram U, Kumar R, Jha P, Million Death Study Collaborators. Maternal mortality in India: causes and healthcare service use based on a nationally representative survey. *medRxiv*. 2014 Jan 15;9(1):e83331.