



## RETROSPECTIVE ANALYSIS OF TRENDS IN MATERNAL MORTALITY AT A TERTIARY CARE HOSPITAL OF BIHAR

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**ABSTRACT** **Background:** Maternal mortality is an indicator of the quality of obstetric care in a community directly reflecting the utilisation of health care services available. It is tragic that deaths occur during pregnancy and childbirth and most of these deaths can be prevented. The aim is to determine the incidence of maternal mortality, assess the epidemiological aspects, causes and various contributing factors and avoidable factors of maternal death in a tertiary care hospital of Bihar.

**Materials And Methods:** It was a retrospective analysis of hospital-based records of all maternal deaths occurring in a tertiary care hospital in Patna, Bihar over a period of one year from May 2019 to May 2020. Demographic details were collected, and the results were analysed using percentage and proportions.

**Results:** In the one year time period a total of 129 deaths occurred and maximum number of deaths occurred in the age group of 19-24 years (38.7%). Majority of maternal deaths happened among multigravida 56% while only 38% were primigravida. 66.6% women belonged from rural background while 33.3% were from urban area. HDP including eclampsia, pre-eclampsia and HELLP syndrome was the leading cause followed by haemorrhage both antepartum and postpartum. Among the indirect causes, severe anaemia was the leading cause.

**Conclusion:** MMR in our study was very high compared to the national average of 113/ 100,000 live births in 2016-18 as it being an apex referral centre of state. Most of the maternal deaths were preventable. Timely detection of complications and early referral to tertiary care centre with proper ANC can help mitigate the problem.

**KEYWORDS :** Maternal mortality, Direct and Indirect cause, Tertiary Care, Sepsis, Haemorrhage, Eclampsia

### INTRODUCTION

Maternal mortality is an indicator of the quality of obstetric care in a community directly reflecting the utilization of health care services available. Maternal mortality is defined as the death of a woman while being pregnant or within 42 completed days of termination of pregnancy, irrespective of the duration or site of pregnancy, from any cause related to or aggravated by pregnancy, but not from accidental or incidental causes.<sup>1</sup> Maternal mortality is defined internationally as maternal death ratio per 1,00,000 live births. It is an indirect parameter for medical services available and also indicates the socioeconomic well being of a community.

Maternal mortality ratio (MMR) of India has declined from 122/ 100,000 live births in 2015-17 to 113/ 100,000 live births in 2016-18 (7.4 per cent decline).<sup>2</sup> Among states, MMR of Bihar is 149 per lakh live births, which is far behind the national average. Although, Bihar has been able to bring down the maternal deaths in the recent years but still it has a lot of ground to cover to achieve the sustainable development goal of reducing the maternal mortality to less than 70 per lakh live birth by 2030.

This study was done in an apex tertiary medical college and hospital in the state capital of Bihar to assess the prevalence and associated direct and indirect factors contributing to maternal mortality, so as to employ certain adaptive measures to improve upon the current scenario, while addressing the major contributing factors.

### METHODS

#### Study design:

This study was conducted at Patna Medical College & Hospital (PMCH), Patna which is a tertiary care centre receiving patients from Patna and also other districts of Bihar. It was a retrospective analysis of all maternal deaths occurring in the Department of Obstetrics and Gynecology over a period of 1 year from May 2019 to May 2020. Maternal death information was collected from death register in department of obstetrics & gynecology. Demographic variables including age, parity, gestational age, delivery details, complications, interventions, cause of death and period from admission to death were studied. Descriptive data was tabulated as absolute figures and percentages.

**Table 1 - Demographic Details**

Socio demographic profile	Number	Percentage
<b>Age (in years):</b>		
<19	5	3.8
19-24	50	38.76
25-29	48	37.2
30-34	16	12.4
>= 35	10	7.7
<b>Parity:</b>		
Primigravida	49	38
Multigravida	72	56
Grand multigravida	8	6
<b>Referral status:</b>		
Referred	98	76
Direct	31	24
<b>Stage of pregnancy:</b>		
1st trimester	6	4.6
2nd trimester	3	2.3
3rd trimester	29	22.4
Postpartum	91	70.5
<b>Pregnancy outcome:</b>		
Live birth	50	38.7
lud	38	29.4
Undelivered	31	24
Still birth	4	3
Abortion	3	2.3
Ectopic	3	2.3
<b>Condition at time of admission:</b>		
Average	32	24.8
Critical	44	34.1
Very critical	53	41
<b>Duration of hospital stay:</b>		
<24 hours	76	59
Less than a week	47	36.6
More than a week	6	4.4
<b>Delivery status:</b>		
Total delivered women	91	70.5
Delivered at our institution	61	67
Delivered outside	30	33

Undelivered	31	24
Abortion	3	2.3
Rupture ectopic	3	2.3

Table 2 - Admission to death interval

Duration of hospital stay	No. Of maternal deaths	Percentage
Less than 24 hours	76	59
24 - 72 hours	32	25
3 - 7 days	15	11.6
More than 7 days	6	4.4

Table 3 - Causes of maternal deaths

Causes of maternal death	Number	Percentage
<b>Direct causes</b>	<b>84</b>	<b>64.9</b>
Haemorrhage (APH, PPH)	31	24
HDP (eclampsia, pre-eclampsia, HELLP syndrome)	37	28.6
Sepsis (puerperal)	5	3.8
Obstructed labour, rupture uterus	8	6.2
Ruptured ectopic	3	6.2
<b>Indirect causes</b>	<b>45</b>	<b>35.1</b>
Severe anaemia	16	12.4
Heart disease	7	5.4
Pulmonary embolism	7	5.4
ARDS	4	3.1
Cardiorespiratory arrest	4	3.1
DIC	2	1.5
Anaesthesia complications	2	1.5
Multiorgan failure	1	0.7
Chronic liver disease	1	0.7
Epilepsy	1	0.7

## RESULTS:

During the one year period from May 2019 to May 2020, a total of 129 deaths occurred. The epidemiological characteristics of maternal death are shown in table 1. In the present study, maximum number of deaths occurred in the age group of 19-24 years 50 (38.7%). Death among teenage pregnancies were 3.8%. Majority of the deaths happened among multigravida 72 (56%) as compared to primigravida 49 (38%). Most of the women 86 (66.6%) belonged to rural background and only 43 (33.3%) were from urban area. Majority of the patients 98 (76%) were referred from other hospital while only 31 (24%) came directly to the hospital. Out of total 129 deaths, 76 (59%) died within 24 hours of admission, 47 (36.6%) within a week and 6 (4.4%) died after one week (table 2)

Only 32 (24.8%) of mother's condition was average at the time of admission, 44 (34.1%) were critical and 53 (41%) were very critical. Majority of mothers died postpartum 91 (70.5%) while deaths occurring in the first and second trimester accounted for only 4.6% and 2.3%. Only 50 (38.7%) of the women delivered a live child before their death, 38 (29.4%) were IUD, 4 (3%) were still birth and rest either did not deliver 31 (24%) or were complications of abortion or ruptured ectopic 6 (4.6%).

Direct causes contributed 84 (64.9%) to the causes of mortality. Among the direct causes, hypertensive disorder of pregnancy (HDP) 37 (28.6%) was the major cause of maternal mortality followed by hemorrhage 31 (24%) including APH and PPH. Ruptured ectopic (2.3%) and sepsis (3.8%) were uncommon causes among the direct causes. Severe anemia 16 (12.4%) leading to cardiac failure was the common cause among indirect causes leading to maternal deaths. The other indirect causes of maternal deaths were heart disease, pulmonary embolism, ARDS, cardiorespiratory arrest, DIC, anaesthesia complications, multiorgan failure, chronic liver disease and epilepsy (table 3).

## DISCUSSION:

Maternal mortality is considered a key health indicator and the direct causes of maternal deaths are well known and largely preventable and treatable. Preventing unwanted births, proper antenatal care and institutional quality care and delivery coupled with women empowerment can help in mitigating maternal deaths in developing countries like India. A high incidence of maternal deaths reflects poor quality of maternal services, late referral and low socioeconomic status of the community. Present study shows comparatively a higher maternal mortality which could be due to the fact that our hospital is a

tertiary care center of the state and receives a lot of complicated referrals from rural as well as urban areas.

In our study, 75% of maternal deaths were in the age group of 20 to 29 years, as highest numbers of births are reported in this age group. Similarly, 56% of maternal deaths were reported in multiparous patients. All our findings were similar to studies by Jain,<sup>4</sup> Jadhav,<sup>5</sup> Pal<sup>6</sup>. Haemorrhage and hypertensive disease of pregnancy were the major direct killers and were comparable to other studies. Though sepsis was a direct cause of death as seen in other studies, it was a contributing factor in many direct and indirect causes. All these are preventable causes of maternal mortality provided the treatment is instituted in time. Unfortunately, in many cases, patients were referred very late, in critical condition, unaccompanied by health care worker. Most of these deaths are preventable if patients are given appropriate treatment at periphery starting from provision of iron tablets to all childbearing age group women, proper antenatal care and timely referral to higher centers. Training of medical officers and staff nurses working in rural areas by programs like basic emergency obstetrics care (bemoc) and skilled attendant at birth (sab) training gives a ray of hope of reducing maternal mortality.

## CONCLUSION:

The causes of maternal deaths are manifold but can be prevented. Even today most deaths are observed among low socio-economic group of patients, belonging from rural background, unbooked and not formally educated. Primary health care revamping apart from and upgradation of health infrastructure in rural areas along with targeted interventions for women right from preconception stage which includes nutritional supplements, free provision of iron and folic acid and necessary midwifery support to the required beneficiaries and with necessary ANC for the mother and fetus, ample targeted approach for early detection and management of high risk, skilled personnel at childbirth, good transport facilities, family planning and safe abortion can help to ensure the wellbeing of the mother and fetus can help in gradual decline of maternal mortality. Ease of accessibility of blood banks to the rural populace at first referral units (FRUS) and seamless dispensing of blood and blood products to the needy at the earliest can happen to save quite few lives. Health education of masses along with good quality health care and transport facilities can prevent many deaths.

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