Research article Available online www.ijsrr.org ISSN: 2279–0543

International Journal of Scientific Research and Reviews

Maternal Mortality Still A Challenge: Retrospective Study at A Tertiary Care Centre

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ABSTRACT

Maternal mortality is regarded as an index of quality of health services of a nation. Maternal deaths are still a major health challenge in our country. Despite appreciable decline in MMR in India, the target of reducing it by three fourthby 2015 (MDG-5) has not been achieved. The current MMR for India is 130while that for Uttar Pradesh is 201; much higher than the national average. Our study aimed at finding out the sociodemographic and epidemiologic factors associated with maternal mortality at a tertiary care centre in Uttar Pradesh and to suggest ways for its reduction.The study was carried out at Sir Sunderlal Hospital, IMS, BHU, Varanasi. We retrospectively checked the details of all the cases of maternal deaths at our hospital from the available records in the labor room over a period of one year (Jan'18- Dec'18). The data was analyzed in terms of maternal age, parity, residence, socioeconomic status, antenatal care, referrals, factors related to delivery and the cause of death and compared with other studies.

MMR was quite high in our study and all were unbooked pregnancies as compared with other studies. Therefore, we advocate for early booking and thorough antenatal care for each and every woman for improvement in maternal health and for reduction in maternal mortality. Non-obstetric causes accounted for high proportion of all mortalities in our study thus indicating the need of a more focused approach in this respect.

KEYWORDS: maternal death, MMR, maternal mortality.

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INTRODUCTION

Maternal mortality is defined as "death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of pregnancy, from any cause related to or aggravated by pregnancy or its management but not from accidental or incidental causes[1]." Apart from maternal death/mortality, the terms like late maternal death (death after 42 days but not less than one year of termination of pregnancy) and pregnancy related death (death due to any cause known or unknown) have also been introduced by WHO which though being similar to maternal death are not used for estimation of maternal mortality[2].

Maternal death is a tragic event and is a huge loss to the entire family, society and the nation as a whole. Every minute, a woman dies as a result of pregnancy and childbirth somewhere in the world. Every year, approximately 600,000 women die of pregnancy related causes and 98% of these deaths occur in developing countries. India accounts for over 20% of the world's maternal deaths[3]. Maternal mortality ratio (MMR) is considered as one of the most reliable indicator of quality of health care services and socioeconomic development of a nation[4]. It is defined as total number of maternal deaths per 100000 total live births in a particular time period and place[5]. Though there has been appreciable decline in MMR in India, the target of reducing it by three fourth as set by United nations for 2015 (MDG-5) has not been achieved[6]. The current MMR in India is 130[7].

The purpose of our study was to study and analyze the sociodemographic and the epidemiological factors of maternal mortality at a tertiary care centre in eastern region of Uttar Pradesh and to suggest ways for its reduction and improvement in maternal health. It was found that MMR of UP was 201[7], much higher than the national figure that is why we took up this study so as to figure out the exact causes of such a high MMR in this region and to propose the changes neededto be implemented for saving the lives of our women.

MATERIALS AND METHODS

The study was carried out at Sir Sunderlal Hospital, IMS, BHU, Varanasi which is a tertiary health care center covering both urban and rural population of eastern Uttar Pradesh and adjoining parts of Bihar, Chhatisgarh and Madhya Pradesh. Details of all the maternal deaths occurring in the Department of Obstetrics & Gynecology over a period of one year(Jan 2018 – Dec 2018) were noted from thelabor room records.Ethical clearance was taken from the institutional ethical committee. Only those cases who fulfilled the definition criteria of maternal death were included in the study.The maternal deaths were categorized as direct obstetric deaths, indirect (primarily medical/surgical) obstetrical deaths or combined (both direct and indirect causes) deaths.

The data of maternal deaths obtained from the hospital files of Dept. of OBGY for one year (Jan'18-Dec'18) wasanalyzed under following points-

- Maternal Mortality Ratio (MMR) at the tertiary care center in the study period.
- Maternal deaths in relation to sociodemographic variables like age, locality, SE status, parity and ANC care received.
- Maternal deaths according to place of their referral.
- Their duration of stay in hospital (admission-death interval).
- ICU availability of those patients.
- Their status at the time of death(post-abortal/antenatal/intrapartum/postpartum).
- Mode of delivery (in postpartum patients).
- The primary cause of maternal death (obstetric/non-obstetric/combined).

RESULTS

Table 1: MMR at the tertiary care center from Jan 2018 to Dec 2018.

Total no. of deliveries	Total no. of live births	Total no. of maternal deaths	MMR(maternal mortality ratio)
4983	4817	32	664.31

A total of 4983 deliveries occurred at our centre in the study period of which 119 had intrauterine fetal deaths and 47 were stillborn; thus total live births were 4817. 32 maternal deaths were noted in the same period thus the MMR (Maternal Mortality Ratio) being 664.31.

$$\text{MMR}^{5} = \frac{Total\ no.\ of\ maternal\ deaths}{Total\ no.of\ live\ births} \times 1{,}00{,}000$$

Table 2: maternal deaths according to sociodemographic variables

Sociodemographic factors	No.	%
1. Maternal age (yrs)		
Upto 20	2	6.2
21 - 30	24	75.0
>30	6	18.8
2. Residence		
urban	5	15.6
rural	27	84.4
3. SE status		
Lower	18	56.3
Middle	10	31.2
Upper	4	12.5
4. Parity		
Primigravida	12	37.5
Multigravida	20	62.5
5. Antenatal care		
Booked	0	0
Unbooked	32	100

Most of our patients were in 21-30yearsage group with mean age being 26.4 years. Majority were from rural areas, low socioeconomic status and multigravida. None of the patients booked at our center died, all the mortalities were unbooked.

Table 3: Maternal deaths according to place of referral

Place of referral	No.	%
Directly from home	4	12.5
Private centres	6	18.9
PHC	14	43.6
CHC	8	25.0

As shown in the table above, four patients had come directly from their homes whereas others were managed at some other centres too and finally been referred. About 44% were referred from PHC's and 25% from CHC's.

Table 4: Distribution of patients according to their duration of stay in hospital

Admission-Death interval (hrs)	No.	%
<12	19	59.3
12-24	3	9.3
24-72	4	12.5
>72	6	18.9

Table 4 shows that majority of patients approached our hospital in critical conditions as 59.3% of patients died within twelve hours of their admission. Delay in seeking expert care due to ignorance, lack of transport facilities or inappropriate care at periphery was the prime factor leading to death in majority of cases.

Table 5: Distribution of patients according to their ICU availability

Received ICU care	No.	%
Yes	8	25.0
No	24	75.0

Table 5 shows that majority (75%) of our sick patients could not get ICU care in time either due to unaffordability or due to unavailability and succumbed to death within span of hours. Few (25%) patients got ICU support but only after terminal damage had already occurred and therefore could not be survived at the end.

Table 6: Status of patients at the time of death

Status of patient	No.	%
Post-abortal	1	3.1
Antenatal	7	21.9
Intrapartum	3	9.3
Postpartum	21	65.7

Out of 32 mortalities, one was post-abortal, 7 died antenatally and 3 died during labor while majority (65.7%) died in the postpartum period specially within first 12 hours after delivery. This signifies the need of utmost observation and meticulous supervision in the immediate postpartum period.

Table 7: Distribution of patients according to mode of delivery

Mode of delivery	No.	%
Undelivered	9	28.1
Abortion	1	3.1
Vaginal delivery	4	12.5
LSCS	18	56.3

Among the patients who died at our centre, 9 were undelivered of which 7 were antenatal (not in labor) and 2 were eclampticintrapartum who died in the operation theatre just before administration of anesthesia for LSCS. One laboring patient died during laparotomy for rupture uterus subsequent to obstructed labor at PHC. One patient expired of post-abortal sepsis as result of abortion at a substandard private centre. Majority of the patients were postpartum of which 56.3% underwent LSCS while 12.5% had delivered vaginally. Among the vaginal delivery patients, one had unattended delivery at home resulting in both traumatic and atonic PPH followed by admission in a PHC and then delayed multilevel referral to our centre. Though we achieved hemostasis, she died within few hours of surgery due to severe acidosis. One NYHA grade IV rheumatic heart disease patient in second stage of labor died within 6 hours of delivery due to sudden pulmonary embolism. Rest two patients had severe jaundice and died 24-72 hours after delivery. Out of 18 LSCS patients, 11 had been operated outside at CHC or private set-up and referred here with PPH, AKI, MODS or septicemia in terminal stage and unfortunately did not get ICU support and could not be revived despite our desperate efforts.

Majority (56.1%) of maternal mortalities were due to obstetric causes among which eclampsia & its complications topped the list followed by hemorrhage. In our study, non-obstetric (medical/surgical) causes like heart diseases, jaundice and infections emerged as an important cause

of maternal mortality as 34.5% of patients died due to them. Combined causes (both obstetric and non-obstetric) accounted for 9.4% of maternal mortalities.

Table 8: Distribution of patients according to cause of death

Cause of maternal death	No.	%
1. Obstetric causes		
Antepartum hemorrhage	2	6.2
Postpartum hemorrhage	4	12.5
Preeclampsia& its complications	7	21.9
Complications of obstructed labor	2	6.2
Septic abortion	1	3.1
LSCS complications	2	6.2
2. Non obstetric causes		
Heart diseases	5	15.7
Liver ds & jaundice	5	15.7
Infections (dengue, typhoid…)	1	3.1
3. Combined causes	3	9.4

DISCUSSION

Maternal mortality is an index of reproductive health of the society. This study attempts to analyze the causes of maternal deaths to have a clear understanding of trend and the magnitude of maternal mortality so that, comprehensive preventive strategies can be formulated to prevent these unanticipated deaths. The maternal mortality ratio (MMR) was 664.3 in our study which is quite high when compared to WHO data for India (130) and UP (201)[7]. Studies by Singh S et al, Agrawal N et al and Bangal VB et al had the MMR values of 292.3, 230.1 and 302.5 respectively; much lesser than in our study whereas MMR was 590 in FOGSI study and 690 in a study by Puri A et al[8-12]. Such a wide variation in MMR at tertiary centresmay be due to the variation in patient profile of the centre chosen for study. At our centre, all the mortalities were of unbooked cases thus proving that regular antenatal care has a pivotal role to play for positive pregnancy outcome[13].

In our study, majority of the patients were in 21-30year age group (75%), from rural areas (84.4%), of lower socioeconomic status (56.3%) and were multigravida (62.5%) which is quite similar with the results of study by Yadav K et al who had 72.68% cases of 20-29 years, 88.65% from rural areas, 69.5% of lower SE status and 56.71% of multigravida patients in their study[14]. Study by Sethi PS et al too was similar to ours as they had 72.6% patients of 19-29 years, 90% patients from rural areas, 77% of lower SE status and 59% of multigravida patients in their study[15].

All these sociodemographic variables need to be improved for reduction in MMR and this requires a holistic approach to this problem. In our study all the maternal mortalities were of unbooked patients as compared to 82% in study by Sethi PS, 92.3% in study by Puri A and 94% in study by Yadav K et al[12,14,15].Quality antenatal care is an integral part of obstetric practice but in our set-up either due to financial constraints or lack of awareness, booking rate was very low and also the peripheral centres opted failed to provide the quality care and timely referral; all these leading to high maternal mortality even in many preventable cases.

Referral cases accounted for 87.5%of mortality in our study as compared to 25% in study by Puri A and 38% in study by Yadav K et al[12,14].Also, the majority (59.3%) of our patients died within hours of admission indicating that they were referred in the terminal stage of their illness. In a study done in Unnao district of Uttar Pradesh, it is clear that referral and transport services are very poor in entire UP and this can explain the high MMR in a centre like ours which takes up high number of referral cases[16]. Another major factor was the unavailability of ICU for critically sick patients.

Analysis of the causes of maternal mortality reveals that non-obstetric etiologies are emerging as a significant cause (34.5%) of maternal mortality similar to study by Shah P et al[17]. Jaundice and heart diseases are increasingly taking the lives of our pregnant women. Early antenatal booking and regular visits can identify a large number of cases with co-incident medical or surgical complications and help in their better management[13]. Since all our mortalities were from unbooked patients, high percentage of indirect obstetric deaths is understandable.

In our study, preeclampsia and its complications was the single most common cause of maternal mortality accounting for 21.9% of maternal deaths alone. This was in contrast to other studies who have reported hemorrhage as the commonest cause ofmaternal death[8-10,12,14].Hemorrhage lagged behind preeclampsia as the leading cause of maternal deaths in our study probably because we could avert such mortalities owing to round the clock availability of blood and its components and also expert surgeons at our centre[18,19]. However, we lost many our cases of preeclampsia because of inappropriate treatment and delayed referral at the PHC or even CHC level and due to unavailability of ICU for those patients in time[20,21].

CONCLUSION

Maternal deaths, though largely preventable are a serious threat in our society. Though a lot of attention has been given to this problem by both government and private sector, the ground reality is still darker and it continues to be a nightmare for the obstetrician and the entire health system; especially in our part of the country. Hence proper evaluation needs to be done and efficient management strategies need to be developed and implemented at every level to root out this problem.

We propose that every patient should have access to quality health care and for this apart from economic empowerment health education andawareness programs needs to be implemented specially in the peripheral areas. The quality of health services at the peripheral referral centres needs to be checked and round the clock availability of transport services must be ensured. The patient must be referred with a proper referral note andaccompanied withtrained healthcare personnel. Also blood transfusion and ICU facilities should be made freely available to critically sick patients. Finally, we need to focus upon non-obstetric causes too as they are emerging as an important cause of maternal mortality.

Ethical approval: taken from the institutional ethical committee

Conflict of interest: none

Funding sources: none

REFERENCES

1. WHO. International statistical Classification of Diseases and health related problems (ICD). 10th revision second edition. Geneva 2004; 2: 98-99.
2. WHO trends in maternal mortality, 1990-2015. WHO, UNICEF, UNFPA, The World Bank and The United Nation population division estimates. 2015.
3. Rao KA. Presidential address. The 44th All India Obstetric and Gynaecological Congress, Ahmedabad. December 27, 2000. J Obstet Gynaecol India. 2001; 51:25-8.
4. Wilmolth JR, Mizoguchi N, Oestergaard MZ et al. A new method for deriving global estimates for maternal mortality. Stat Polit Policy 2012; 3(2). DOI: 10.1515/2151-7509.1038.
5. Reproductive health indicators: guidelines for their generation, interpretation and analysis for global monitoring. Geneva, WHO 2006.
6. Millennium Development Goals – Final country report of India, Social statistics division, Ministry of statistics and programmeimplemention (MOSPI), Govt. of India. Nov 2017.
7. Special bulletin on maternal mortality in India 2014-16, Sample registration system (SRS), Office of Registrar General, India. May 2018.
8. Singh S et al.Maternal mortality at a tertiary health care: a retrospective study. Int J Reprod Contr Obs & Gyn 2018; 7(5):1733-37.
9. Agrawal N, Upadhyay SK, Hakim A, Mittal M. An analysis of trends in maternal mortalityat a tertiary care teaching hospital of western Rajsthan, India: a four years retrospective study. Int J Comm Med Pub Health 2017; 4(3):864-67.
10. Bangal VB, Giri PA, Garg R. Maternal mortality at a tertiary care teaching hospital of rural India: a retrospective study. Int J Bio Med Res 2011; 2(4):1043-46.

11. Konar H, Chakraborty AB. Maternal mortality: a FOGSI study (Based on institutional data). J ObstetGynaecol 2013; 63(2):88-95.
12. Puri A, Yadav I, Jain N. Maternal mortality in an urban tertiary care hospital of north India. J ObstetGynaecol 2011; 61:280-5.
13. WHO recommendations on antenatal care for a positive pregnancy experience, World Health Organization (WHO) 2016.
14. Yadav K, Namdeo A, Bhargava M. A retrospective and prospective study of maternal mortality in rural tertiary care hospital of Central India. Ind J Comm Health 2013; 25(1):16-19.
15. Sethi PS. Maternal mortality in a tertiary care in North India. Int J ReprodContrObs&Gyn 2017; 6(12):5559-62.
16. Raj SS, Manthari S, Sahoo PK. Emergency referral transport for maternal complications: lesson from the community based maternal death audit in Unnao district, Uttar Pradesh, India. Int J Health Pol Man 2015; 14(2):99-106.
17. Shah P, Shah S, Kutty RV, Modi D. Changing epidemiology of maternal mortality in rural India: Time to reset strategies for MDG-5. Trop Med Int Health 2014; 19(5):568-75.
18. E Guasch, F Gilsanz. Treatment of postpartum hemorrhage with blood products in a tertiary hospital: outcomes and predictive factors associated with severe hemorrhage. ClinApplHemost 2016; 22(7):685-92.
19. WHO recommendations on use of surgical intervention for the treatment of postpartum hemorrhage, World Health Organization (WHO), Geneva, Sep 2012.
20. Joshi SD, Veerendrakumar CM. Single dose Mgso4 regimen for eclampsia – A safe motherhood initiative. J ClinDiagn Res 2013; 7(5):868-72.
21. MTC Lam, E Dierking. ICU issues in eclampsia & HELLP syndrome. Int J CritIllnInjSci 2017; 7(3):136-141.