 DOI: 10.18231/2394-2754.2016.0014

Insight into five year maternal mortality of tertiary referral hospital in central India–destination far ahead

Bharti Sahu[1], Poorva Badkur[2,*]

[1]Assistant Professor, [2]Senior Resident, NSCB Medical College, Jabalpur, Madhya Pradesh

***Corresponding Author:**
Email: poorvadoc@gmail.com

Abstract

Aims and Objectives

1. To study five years maternal mortality in the tertiary referral hospital of MP.
2. To find out various causes of these maternal deaths.

Method: A retrospective analysis of maternal deaths from hospital records and death summaries of five years between Jan 2010 to Dec 2014 at NSCB Medical College and Hospital, Jabalpur in Madhya Pradesh.

Results: During the review period, there were 349 maternal deaths and 22,260 live births direct causes were 69% (n = 243), of which 49.2% (n = 174) from pregnancy induced hypertension and 8.8% (n = 30) from hemorrhage, were the leading causes of mortality. Out of total, indirect causes were 30.37% (n=106) of which severe anemia 20.06% (n=70) had topped. Of all, 94% (n=340) women were unbooked, 83% (n=290) were resident of rural areas, 82% (n=286) belong to age group 20-30 years and 56% (n=197) were primigravidas, 80% (n=281) were referred, and 62% experienced delay in care.

Conclusion: The load of maternal mortality was found to be intolerably huge. Most women died of direct causes and experienced delay in care. Improvement in the quality of skilled maternity care, need to avail good, proper and effective antenatal care, timely referral, prompt transportation, provision of family planning services, among other factors, can drastically curtail the maternal deaths.

Introduction

Almost all maternal deaths (99%) occur in developing countries.[1,2] Between 1990 and 2010, maternal mortality worldwide dropped by almost 50% but still it is very high. India is among those countries, which has a high maternal mortality ratio. Maternal mortality varies from state to state and region to region in India itself.

Maternal mortality ratio is an important indicator of existing obstetric services and socioeconomic status of a country.[3] It also reflects the educational and public health consciousness of a country. Institutional mortality rates are 2–10 times higher as compared with field surveys because most of the seriously ill patients are referred to the nearest tertiary care centre.[3]

Maternal demise is a great set back on the family, the society and the nation. The Government of India is committed and struggling to tackle the health and mortality statistics of the rural poor, and of the scheduled caste and tribal peoples, who significantly contribute to the global mortality rates of mothers and children under the age of 5 years.[4]

Hence, this present study was conducted to review the existing maternal mortality ratio and the causes of maternal death at a tertiary care teaching hospital in Central India. So that, corrective measures can be taken to reach the goal within the stipulated time frame as most of the deaths if timely intervened are very much preventable.

Materials and Method

The present study is a retrospective study of maternal mortality occurred in Obstetrics and Gynecology Department of Netaji Subhash Chandra Bose, Government Medical College and Hospital, Jabalpur a tertiary level health care referral centre, in Madhya Pradesh. In this study, "maternal death" defined according to the tenth revision of International Classification of Diseases(ICD-10) by WHO. It is described as the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and the site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes. All maternal deaths of 349 during the period of 5 years from 1st Jan 2010 to 31st Dec 2014, were analyzed with the special emphasis on cause of death. In the critical study of maternal mortality the details were recorded in the designed proforma & influences of variables such as age, parity, marital status, age at marriage, booked vs unbooked, geographical location, educational status, socio-economic status, time interval since admission, mode of delivery, causes of death and various other factors have also been considered. The results were analyzed and calculated in percentage form.

Inclusion Criteria: All maternal deaths occurring during pregnancy and within 42 days of delivery including ectopic pregnancies, septic abortions, and molar pregnancies.

Exclusion Criteria: All maternal deaths falling out after 42 days of delivery.

Results

Total no. of live births during the study period was 22,260 while total no. of maternal deaths were349. (Table 1)

Amongst the direct causes(69%), eclampsia and pre-eclampsia together accounted for 49.57% of the deaths, while obstetric hemorrhage stood second at 8.6%. (Table 6)

Amongst the indirect causes(30.2%), anemia topped at 20.3% (Table 7). 30% died undelivered and 70% died in the postnatal period.

Discussion

Trend towards maternal mortality rate: In the present study, 349 maternal deaths amongst 22,260 deliveries during study period, which is much higher than the national average of 190.

NSCB Medical College and Hospital is situated on the outskirts of Jabalpur city and it caters population from approximately 300km periphery. The tertiary care hospitals, regrettably, receives usually complicated and referred cases, sometimes, the patients are admitted only during the terminal stages of their illness. This may be the reason for such an inflated MMR like other teaching institutions of India.

The maternal mortality rate at teaching hospitals in India is very high and varies from 3778 (Allahabad U.P.) to 215 (Trivandrum, Kerala) per 100,000 live births. Dr. R. V. Bhatt, in 2000 shows an MMR of 30.9 per 100,000 births in over 41000 private sector deliveries. Unfortunately, Janani Suraksha Yojana has put an extra load on institutional deliveries without making as earnest an effort to promote the dire need of good antenatal care in reducing maternal morbidity and mortality. As the total number of institutional deliveries has gradually risen, also those women who were taking their last breath at home are rushed in a very critical state in the hospital with MMR aiming skyward.

Death of mother is a tragic event. The young surviving children left motherless, are unable to cope with daily living and are at an increased risk of death. By better health services and proper health care in remote and rural areas there will be definite reduction in maternal mortality.

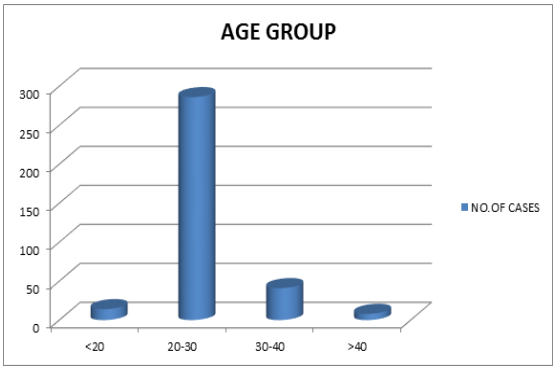
Table 1: Year-wise deaths (from 2010 to 2014)

Year	2010	2011	2012	2013	2014
Maternal deaths	78	56	78	62	75

Age-wise distribution of maternal deaths: The present study show 82% maternal deaths were observed in the age group of 21-30 yrs. (Table 2) Begum S. et al and Rahul Shah et al also reported high mortality in age group of 21-30 yrs.[5,6]

Table 2: Age-wise distribution of maternal deaths in number and percentage

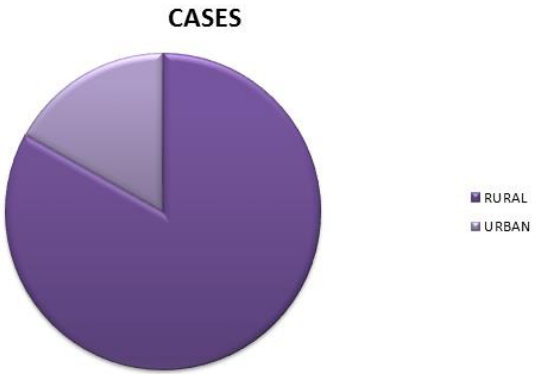
Age group	No. of cases 349	Percent
<20 yrs	14	4%
20-30yrs	286	82%
30-40yrs	41	12%
>40yrs	8	2.29%



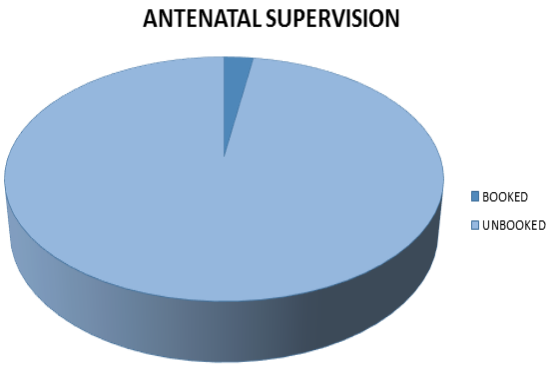
Maternal deaths in accordance with antenatal supervision: The high percentage of deaths in unbooked cases indicates the importance of adequate antenatal care. In studies by Dilpreet Kaur et al,[7] Amitav Pal et al[8] and Verma Ashok et al[9] more than 80% maternal deaths were unbooked. The quality of the care is also very important as the facilities may lack even the most basic resources like the drugs (iron, calium), the means to measure the blood pressure and hemoglobin. Most of our Indian population lives in rural areas. Besides poor resources of health facilities and illiteracy in these areas, they fail to understand the seriousness of problems they may land up into due to complications of pregnancy at times if not taken proper care. Poor quality or inadequate antenatal care was seen in 97.4% of maternal deaths (Table 3) 90.6% in Kulkarni, Sunanda and Huligol[3] study were unbooked. This does not imply that fewer pregnant women are receiving ANC, but that, those women who comply with their prescribed plan of antenatal care are rescued from the tragedy of death.

Table 3: Distribution according to residence and antenatal supervision whether Booked or unbooked

Rural	290	83%
Urban	59	17%



Booked	9	82%
Unbooked	340	97.5%



Distribution of maternal deaths according to gravidity: In the present study, 56% of maternal deaths were primigravida which is comparable to study by Surendranath Panda et al.[10] The above profile shows that our poor rural girls are still married at tender age and die young. Childbearing remaining a stopable cause of these untimely deaths.

Kulkarni Sunanda and Huligol,[3] and the ICMR task force study[11] showed an almost similar demographic profile. Poverty, illiteracy, unawareness and casual acceptance of child bearing together with a shortage of trained and more importantly, dedicated health professionals remain a major hurdle in providing good antenatal care.

Distribution of admission- interval and maternal deaths: In present study, 62% of the subjects gave up their battle with life within 24 hour of hospital admission and within 48 hrs up to 73.6%. Other studies have reported an incidence ranging from 54 to 70%.[3] The subjects or more truly, their families, compounded by poor transportation, bring them late to the hospitals, and very little time for positive intervention is available.

In the study by Verma Ashok et al,[9] 46.15% of maternal deaths occurred within 24hours and in Dilpreet Kaur et al study majority maternal deaths (48.10%) occurred within 24–48 hours of admission.[7]

Distribution of direct causes of maternal deaths deaths: In the present study, most of maternal deaths 69% were due to direct causes which include death due to toxemia 50.56%, from hemorrhage 8.6% and from sepsis were 5.73%, each of these are avoidable by proper high risk screening and timely effective management. Deaths due to eclampsia is very high in our study. This is mainly because many patients come to hospital without any blood pressure recording ever before or during their pregnancy reflecting poor quality of antenatal care. These were likely avoidable deaths if pregnancy was terminated early. Early referral to a higher centre may have helped these patients.

In Ratan Das et al study,[12] direct cause contributed to 81.64% of maternal deaths, amongst them, 43.75% were due to eclampsia, 21.87% due to hemorrhage and 13.28% by sepsis, comparable to our study.

Distribution of indirect causes of maternal deaths: In the present study, 20.06% of maternal deaths were because of anemia which corelates with the results from Surendranath Panda et al (2000)[10] and Verma Ashok et al (2008).[9] Amongst the indirect causes anemia is the topmost cause of death which is absolutely Preventable to a great extent by iron, folic acid, protein supplement, anti-helmenthics, revealing the dismal nature of primary prevention from childhood through adolescence into pregnancy. Pre-existing anemia deteriorates gradually as pregnancy advances leading to congestive heart failure and death. It also impairs the mother's ability to fight infection or cope with hemorrhage and increases the chances of her dying four times during childbirth.

Availability of better antibiotics on demand (under various schemes and privileges by government) has resulted in good outcome and fewer number of subjects dying of infection. Similarly, good blood banking and transfusion services, have shown a positive impact in reducing mortality due to obstetric hemorrhage (Table 6). For the above reasons as well as due to better diagnostic modalities, death from ectopic pregnancy and abortions has also significantly decreased. Due to increasing aptitude and practices of contraception, legal abortion services and better methods and drugs for abortion and prophylactic antibiotic use, deaths because of septic abortions has also declined.

Although more pregnant women are approaching the health services but, lack of adequately trained and dedicated health personnel at these rural areas probably resulted in the unfortunate women being picked up and referred very late to a tertiary centre. For every pregnant woman who succumbs, there remains behind many who suffer from short or long-term morbidities. Antenatal and intranatal care has taken a backseat to the only goal of institutional deliveries providing monetary incentives to the patients' family and health care providers irrespective of the outcome of pregnancy.

Table 4: Distribution according to maternal deaths and their gravid status

Gravida	No. of Cases	%
G1	197	56%
G2	74	21%
G3	45	12%
G4	20	5.7%
>G4	13	3.7%

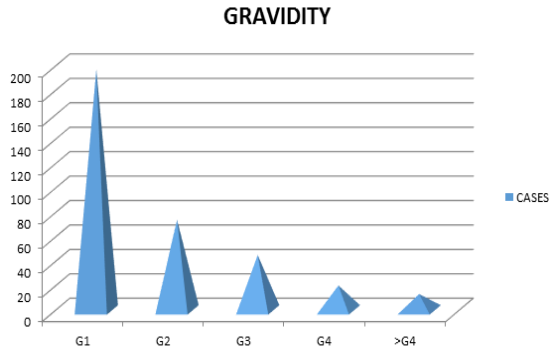


Table 5: Distribution of Admission-interval and maternal deaths

Duration of stay in hospital	No. of cases	%
<12 Hrs	145	41.5%
12-24 Hrs	72	20.6%
24-72 Hrs	82	23.4%
72 Hrs-5Days	27	7.7%
>5Days	23	6.6%

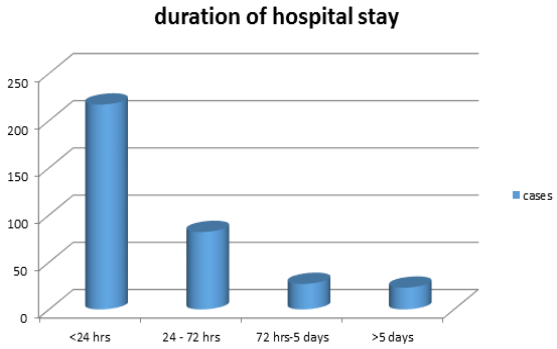


Table 6: Distribution of direct causes of maternal deaths

Direct Causes	243	69%
Eclampsia	141	40.11%
Pre – eclampsia	33	9.46%
Obstructed labour	19	5.44%
Sepsis	20	5.73%
Haemorrhage	30	8.6%

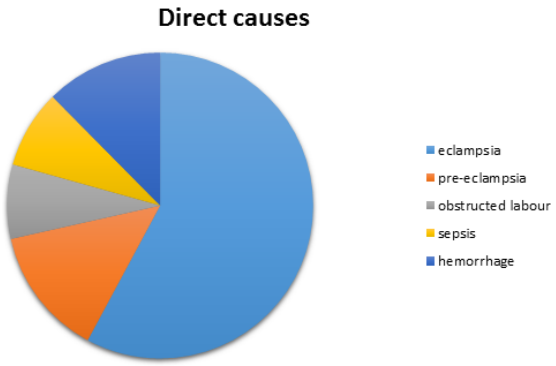
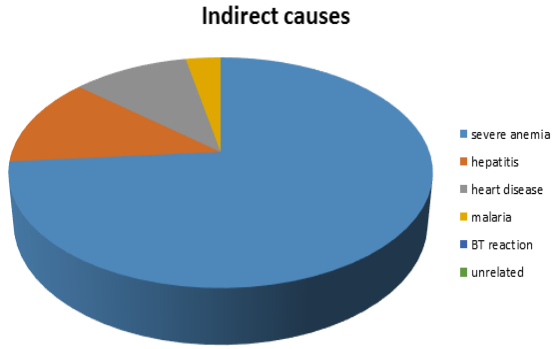


Table 7: Distribution of indirect causes of maternal deaths

Indirect Causes	106	30.37%
Severe Anaemia	70	20.06%
Hepatitis	12	3.44%
Heart Disease	10	2.87%
Malaria	3	.86%
B T Reaction	0	0%
Unrealated	11	3.15%



Conclusion

Since the decades, despite government all efforts and energy, the fall in this direction in MMR has been slow, especially in our vicinity. Much needs to be done for maternal health care in rural areas as most of the deaths reported are referrals from peripheral centres.

This study shows first delay, second delay, lack of resources and lack of focus on effective strategies (emergency obstetrics care and skilled birth attendance) were responsible for maximum preventable and treatable direct deaths. There should be a good health communication system between health centers at urban slums and tertiary care centre. It is necessary even in tertiary centres to channel the working of emergency obstetric care by which 40% MMR can be bought down. Death reviews to be attended by all personnels (health and administrative; public and private)[13] involved in the care of pregnant women should be held, accountability discussed and fixed (presently, there is no such system in place). Taking appropriate remedial steps for filling lacunae noted in the management of these cases will be of paramount value in reducing the maternal mortality.

If the trend persists, we may be derailed from the track in achieving the Millennium Development Goal 5 with respect to maternal mortality.

Instituting integrated maternal health services with emphasis on primary health care, emergency obstetric care, holistic approach including literacy, nutrition, social and economic empowerment can achieve remarkable improvement and shed the burden of MMR from India.

References

1. Countdown to 2015 for maternal, newborn and child survival: accountability for maternal, newborn and child survival. Geneva: Who Health Organisation, 2013 (http//www.countdown2015mnch.org/documents/2013Report/Countdown_2013-Updates_noprofiles.pdf).
2. Trends in maternal mortality: 1990-2010—estimates developed by WHO, UNICEF, UNFPA and the World Bank. 2012. (http//www.unfpa.org/public/home/publications/pid/10728).
3. Kulkarni Sunanda R, Huligol A. Maternal mortality: 10 years study. J Obstet Gynecol India.2001;51:73–76. doi: 10.1159/000052897. [Cross Ref]
4. World Health Organization & Unicef. Countdown to 2015 Decade Report(2000–2010):Taking Stock of Maternal, Newborn and Child Survival. Geneva: WHO and UNICEF, 2010 [http//www.childinfo.org/files/countdownReport 2000-2010.pdf] Accessed 17 August 2011.
5. Begum S, Aziz-un-Nisa, Begum I. Analysis of maternal mortality in a tertiary care hospital to determine causes and preventable factors. J Ayub Med Coll. Abottabad 2003;15:49-52.
6. Rahul Jabeen Shah, Imtiaz Ali, Altaf Banday, Anjum Fazili, Imran Khan, Analysis of maternal mortality in a small teaching hospital attached to tertiary care hospital (a 10 yr review), Department of Community Medicine, S. K. Institute of Medical Sciences, Srinagar, India2008; vol. 33, issue 4:260-262.
7. Kaur D, Kaur V, Yuel VI. Alarmingly high maternal mortality in 21st century. JK Science 2007;9(3):123-126.
8. Pal Amitava, Ray Prasanta, Hazra Samir, Mondal TK. Review of changing trends in maternal mortality in a rural medical college in West Bengal. J Obstet Gynecol India 2005;55(6):521-524.
9. A study on Maternal Mortality Verma Ashok, Minhas Santosh, Sood Anupa, Dr. Rajindra Prasad Government Medical College, H.P. J Obstet Gynecol India Vol. 58, No. 3: May/June 2008: Pg-226-229.
10. Prof. S.N. Panda, as a keynote address on 21/09/02, atthe6thWorld Congress and 14th Indian Conference on Reproductive and Child Health Care held at New Delhi from 20th. 22nd, September 2002, organised by the National Association for Reproductive and Child Health of India Delhi Branch A Study on Septic Abortion at a Tertiary Hospital - Prof. S.N. Panda & Dr. S. Bandyopadhyay.
11. Bedi N, Kambo I, Dhillon BS, et al. Maternal deaths in India—preventable tragedies (An ICMR Task Force Study) J Obstet Gynecol India. 2001;51:86–92.
12. Ratan Das, Soumya Biswas and Amitava Mukherjee Maternal mortality at a teaching hospital of rural India; A Retrospective Study International Journal of Biomedical and Advance Research 2014Feb (05) (02) 578.
13. Veille J-C. Maternal mortality Programme Obstet Gynaecol. 2008;18:125– 142.