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Original Research Article

Analysis of maternal mortality at a government teaching hospital GMKMCH, Salem, Tamil Nadu, India: a retrospective study

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ABSTRACT

Background: Mother is the pillar of the family. Maternal death is a great loss to the baby, family, society and country. Pregnancy although being considered as a physiological state carries risk of serious maternal morbidity and mortality . This is due to various complications that may occur during pregnancy, labour or thereafter. Maternal mortality ratio is a very sensitive index that reflects the quality of healthcare provided by the community to the women population.
Methods: A retrospective study of 204 maternal deaths over a period of 56 months from July 2013-february 2018. Demographic data were collected from maternal death review form and records. Data studied and analyzed.
Results: During the study period, there were 33968 deliveries and 204 maternal deaths with a MMR of 600.5/1,00,000 live births. Eclampsia was the leading direct cause of death. Anemia was the leading indirect cause of death. Most of the women died within 24 hours of admission suggesting that majority of patients reached the tertiary care hospital quite late. Majority of deaths occurred in the age group of 20-30 years and in postpartum period.
Conclusions: Most maternal deaths are preventable by optimal utilization of existing MCH facilities, identifying the bottleneck in health delivery system, early identification of high-risk pregnancy and therein timely referral to tertiary care centre.

Keywords: Anaemia, Eclampsia, Maternal death

INTRODUCTION

Maternal mortality is defined as the death of any 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 cause.[1]

Maternal mortality ratio is defined internationally as maternal deaths per 1, 00,000 live births. India is among the countries which has a very high maternal mortality ratio. Maternal Mortality ratio was 2000 per 1, 00,000 live births in 1938 which declined to 1000 per 1,00,000 live births in 1951 and dropped down to 540 in 1999.[2] Currently it is estimated to be 174 per 1,00,000 live births which is far above the goal of 100 per 1,00,000 live births as per the agenda of Millennium Development Goals(MDG).[3].MMR averages at 27/1, 00,000 live births in developed countries to 480/1, 00,000 live births in developing countries.

Global maternal mortality is at 529,000 women per year of which only 1% death occurred in developed countries.[4] The high number of maternal deaths in some areas reflect inequality in access to health services and highlight the gap between rich and poor. Hence the present study was conducted to review the existing maternal mortality ratio and to find out the cause of maternal death at tertiary care teaching hospital so that the corrective steps can be taken

to reach the goal within the stipulated time frame as most of the deaths are preventable.

METHODS

Type of study: Retrospective study.

The present study was a retrospective analysis conducted in the department of Obstet and Gynaecol of GMKMCH, Salem, Tamil Nadu, India. Data regarding maternal mortality was collected from medical record section of our hospital. The details of maternal death over a period of 56 months from July 2013 to February 2018 was collected and analyzed with respect to the following epidemiological parameters: distribution of maternal death in relation to age, parity index, period of death, referral status, mode of delivery and cause of death.

Inclusion criteria

- All maternal deaths during the period of 56 months from July 2013 to February 2018 was included for the study.

Exclusion criteria

- Brought dead cases and death due to suicide and homicide was excluded from the study.

The angle between the ultrasound beam and direction of blood flow was maintained below 450 for umbilical artery. The umbilical artery was studied in a free loop. Umblical artery (UA) systolic diastolic ratio >2SD above mean or absent or reversed end diastolic flow in umbilical artery was taken as abnormal. UA PI and UA RI were measured and value >2SD was taken as abnormal. The middle cerebral artery was visualised at the circle of Willis and was insonated soon after its origin from internal carotid artery and the angle of insonation kept close to 00. The pulsatility index was measured and cerebroumblical PI ratio calculated. MCA-RI was considered abnormal if measurement was 2 SD below the mean. All the ultrasound evaluations were done by a single obstetrician with expertise in Doppler sonography.

Results were analysed by using percentage and proportion.

RESULTS

In the present study there was 204 maternal deaths for 33968 deliveries giving MMR of 600.5 per 1,00,000 live births which is higher than the national average. GMKMCH being teaching institute and tertiary care center we receive many complicated cases from rural places.

Admission of moribund cases from periphery has reflected the high mortality ratio like other teaching institutes in India. The results were tabulated based on age, mode of delivery, period of gestation, parity index and cause of death (Table 1).

Table 1: Maternal death year-wise.

Year	Total deliveries	Live births	Maternal death
2013	3359	3301	22
2014	6976	6857	40
2015	6944	6863	55
2016	7687	7606	39
2017	9017	8909	45
2018	1215	1203	03

11.76% of maternal death occurred in the age group of less than 20 years (Table 2). In this age group incidence of preeclampsia and anemia was very high. Hence teenage marriages and pregnancy should be avoided.

Table 2: Age-wise distribution.

Age Group	Number of maternal deaths	Percentage
<20	24	11.76
21-30	104	50.98
31-40	65	31.86
>40	11	5.39

62% of death occurred following caesarean section (Table-3).

Table 3: Mode of delivery.

Mode of delivery	Number of deaths	Percentage
Vaginal	57	38
Caesarean section	93	62

Our institution is a referral centre hence the caesarean section rate is 50%. Since the caesarean section rate is high the incidence of maternal death following caesarean section is also high. 73.52% of deaths occurred in the post-partum period (Table 4).

Table 4: Period of Pregnancy at the time of death.

Period of pregnancy	Number of deaths	Percentage
Antepartum	48	23.52
Intrapartum	6	2.95
Postpartum	150	73.52

By improving the antenatal care and institutional deliveries, death during antepartum and intrapartum period has reduced. Postnatal care and follow up of the patient need to be improved to reduce the deaths in the post-partum period.

77.94% of deaths were in the referred patients (Table 5) (Table 6) (Table7). Since our institution is a tertiary care

referral central 70% our admission are referral patients. So, the percentage of death in the referral patients in high.

Table 5: Referral status.

Referral Status	Number of deaths	Percentage
Referred	159	77.94
Internal	45	22.05

Table 6: Parity index.

Parity index	Number of deaths	Percentage
Primi	138	67.64
Multi	66	32.35

Table 7: Causes of maternal deaths.

Cause of maternal deaths	Number of deaths	Percentage
Direct cause	160	78.43
Indirect cause	44	21.56

29.90% of deaths were due to preeclampsia and complications (Table 8).

Table 8: Direct cause.

Cause of death	Number of deaths	Percentage
Preeclampsia/ HELLP/ Eclampsia	61	29.90
PPH/ APH	49	24.01
Sepsis/ MODS	41	20.09
Pulmonary embolism/ amniotic embolism	7	3.43
Ectopic pregnancy	2	0.98

Hemorrhage accounts to 24.01% of death. Following active management of third stage of labour universally and availability of oxytocics, the death due to hemorrhage is reduced. 10.29% of death were due to anemia (Table 9).

Table 9: Indirect cause.

Cause of death	Number of deaths	Percentage
Anaemia	21	10.29
Heart disease	9	4.41
CVT/CVA	8	3.92
Renal Failure	1	0.49
Bronchopneumonia	3	1.47
Hepatic failure	1	0.49
HIV/HBV	1	0.49

DISCUSSION

In India most of the maternal death take place in institutions, more so in government teaching hospitals. In present study the maternal mortality ratio was 600.5/ 1,00,000 live birth which is comparable with the study done by Malipatil.P et al in 2016 where the MMR is 586/1,00,000 live birth.[5]

In present study the maternal death is more in the age group of 21-30 years which is 50.98% which is comparable to the study done by Kaur et al which showed 51.8 % (6) .and also comparable to the study done by Sengupta et al which observed that 61%of death occurred between the age group of 21-30 years.[7]

In present study 62 % of maternal death occurred following caesarean section which varied from the study done by Malipatil. P et al which showed 16.9 % of death following caesarean section.[5] Similarly it varied from the study done by Madhuri Badrinath et al which showed 20% of death following caesarean section.[8]

In present study postpartum death contributed to 73.52% which is comparable to study done by Malipatil. P et al which showed 60.8%.[5] Similarly, another study done by Purandare et al showed 73.33 % death were in postpartum period.[9]

In present study the death in primigravida is 67.64 % which is comparable with the study done by Ratan Das et al which showed 63.28% of death in primigravida.[10]

In present study 78.43 % of death were due to direct cause which is comparable with study done by Ratan Das et al which showed 81.64 % of death were due to direct causes.[10] It is also comparable with study done by Surekha et al which showed 61.51% of death were due to direct causes and study done by Chakraborty. S et al which showed 60-71% of death were due to direct causes.[11,12] In present study major cause of maternal death was preeclampsia and eclampsia which contribute to 29.90 % which is comparable with study by Chakraborty. S et al which showed 27.63 % were due to preeclampsia and eclampsia.[12] Similarly study done by Madhuri Badrinath et al showed 28.8 % of death were due to preeclampsia and eclampsia (8). Similarly, study done by Surekha et al showed 28.19 % of death were due to eclampsia and preeclampsia.[11]

CONCLUSION

Present study shows preeclampsia and its related complications and obstetric haemorrhage, and sepsis are the leading causes of maternal death which are potentially preventable. Maternal death can be prevented by improving the health care facility in rural areas by ensuring round-the-clock availability of delivery facilities, life-saving drugs like injection magnesium sulphate, injection oxytocin, and tablet misoprostol can reduce the death due to eclampsia and PPH.

Early detection of high-risk pregnancies and referring them to tertiary care centres at the earliest can reduce the complications and death.

National Rural Health Mission plays a major role in reducing the maternal mortality by advocating institutional deliveries, timely referral of high-risk cases and tracking of high-risk cases.

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