ISSN: 0975-3583,0976-2833 VOL13, ISSUE 05, 2022

ORIGINAL RESEARCH

MATERNAL MORTALITY IN A TERTIARY CARE HOSPITAL IN NORTH INDIA- A THREE YEAR REVIEW- ANALYSING THE LACUNAE

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Abstract

Background: Pregnancy is a physiological phase in the lifetime of a woman that carries the risk of maternal mortality due to various complications that may arise during pregnancy, labour and post partum period.

Aims and Objectives: To find the causes leading to maternal death, and analyse the lacunae that attributed to maternal mortality.

Material and methods: This retrospective study was conducted in the Department of Obstetrics and Gynaecology, Government Medical College, Amritsar that caters health services to nearly seven districts in the state of Punjab. The record pertaining to maternal mortality for the period Jan 2019 to Dec 2021 were scrutinized for various factors like maternal age, gravidity, registered /referred case, cause of deaths and level of delay likely associated with maternal death.

Results: Over the study period 237 maternal deaths were recorded at our institution in 16943 delivery cases. Majority of the deaths occurred in the age group 20 to 29years (66.24%). A higher mortality was recorded in multigravidae (59.49%). Referred patients accounted for 93.67% maternal deaths in the study group. Hypertensive disorders of pregnancy (25.74%) and obstetrical haemorrhage (13.92%) were the leading direct causes. Respiratory infections (viral/bacterial pneumonia, TB) were incriminated as the leading indirect cause in 42(17.72%) cases. Level I delay was noticeable in (74.26%) cases.

Conclusion: Maternal mortality can be further curbed by ensuring regular antenatal care, screening for high risk pregnancies, early referral to higher centers, institutional delivery, postpartum follow-up and promoting comprehensive abortion care. Peripheral centres need to be strengthened in terms of infrastructure and manpower to deal with the unforeseen complications in low risk antenatal cases as deaths in transit do occur.

ISSN: 0975-3583,0976-2833 VOL13, ISSUE 05, 2022

Key words: Maternal mortality, Direct obstetrics cause, Indirect obstetrics cause.

Introduction

"Maternal mortality or Death is defined (as cited in International Classification of Diseases or ICD-10, WHO 1992) as the death of a woman while pregnant or within 42 completed days of termination of pregnancy irrespective of the duration or site of pregnancy and can arise from any cause related or aggravated by pregnancy or its management but not by incidental or accidental causes."(1)

In 2015 globally 3,03,000 women died of various causes related to maternity.(2) National Rural Health Mission (NRHM) and Millennium Development Goal's target was to reduce Maternal mortality ratio (MMR) to less than 100 by 2015 in India. United Nation analysis of the Millennium Development Goal-5 reveals that the India along with other South Asian countries, which account for 25% of maternal deaths globally, failed to reach the destined goal.(3)Yet at the same time, the Sample Registration System (SRS) Report of the Registrar General of India, highlights that the MMR in India has been witnessing a progressive reduction in the MMR from 130 in 2014-12016, 122 in 2015-17, 113 in 2016-18 and to 103 in 2017-19.

The Sustainable Development Goal 3(SDG3)Plan is to reduce the global mortality ratio to fewer than 70 per 1,00,000 live births by 2030 and have suggested that no country should have MMR greater than 140 per 1,00,000 live births, a number twice the global target.(4)

Analysis of data pertaining to maternal deaths serve to highlight the existent lacunae and to formulate evidence based interventions to avert maternal death.

Objectives

- To study the causes of Maternal Mortality in our hospital.
- To analyse the existent lacunae in these maternal deaths.

Methodology

The present study is a retrospective observational study conducted in the department of Obstetrics and Gynaecology, Government Medical College, Amritsar, Punjab. It is a tertiary care centre that caters services both to the registered patients and to the referrals from the adjoining regions. The data pertaining to maternal mortality from Jan 2019 to Dec 2020 was collected from case sheets and Facility Based Maternal Death Review Forms. These forms had been filled by the treating doctor and reviewed by the supervising faculty within 24 hours of the death of the woman. The maternal deaths had been audited every month by a committee constituted by the senior faculty of the department along with experts from other specialities like Medicine, Surgery, Blood Bank, Anaesthesia....The recommendations of the committee, that were put on record in the minutes of meeting, were subsequently conveyed to the district nodal officer at the time of monthly maternal death review meeting. The collected data was analysed with respect to the following parameters:

- Age-wise distribution of maternal deaths
- Gravidity-wise-distribution
- Registered/ Referred case

ISSN: 0975-3583,0976-2833 VOL13, ISSUE 05, 2022

- Cause of maternal death
- Any evident delay leading to the recorded maternal death

Inclusion criteria

All maternal deaths that occurred in our institution during the study period.

Exclusion criteria

Maternal deaths that occurred after 42 days after the termination of pregnancy.

Definition of study variable

Status of the patient

Registered: A patient who was already visiting our hospital for antenatal check up.

Referred: a patient referred from some other health facility (Public /Private)or came directly from home.

Classification of maternal mortality

Direct Obstetrics Death are those resulting from complications of pregnancy, labour, puerperium, from interventions, omissions, incorrect treatment or from chain of events resulting for any of the above .

Indirect Obstetrics Death are those that are present before pregnancy or developed during pregnancy and got worsened by the physiological effects of pregnancy and strain of labour.

Cause of maternal mortality

Primary cause: The disease /event which initiated the chain of events leading to death.

Contributory cause: Condition that may exist prior to development of the primary cause of death or developed during chain of events leading to death.

Types of delay

Level I: Delay in deciding to seek care.

Level II: Delay in reaching the healthcare.

Level II: Delay in receiving care.

Results

During the study period 237 maternal mortalities were recorded at our institute.

ISSN: 0975-3583,0976-2833 VOL13, ISSUE 05, 2022

Table 1: Maximum maternal deaths, 157 (66.24%) were reported in the age group 20-29 years.

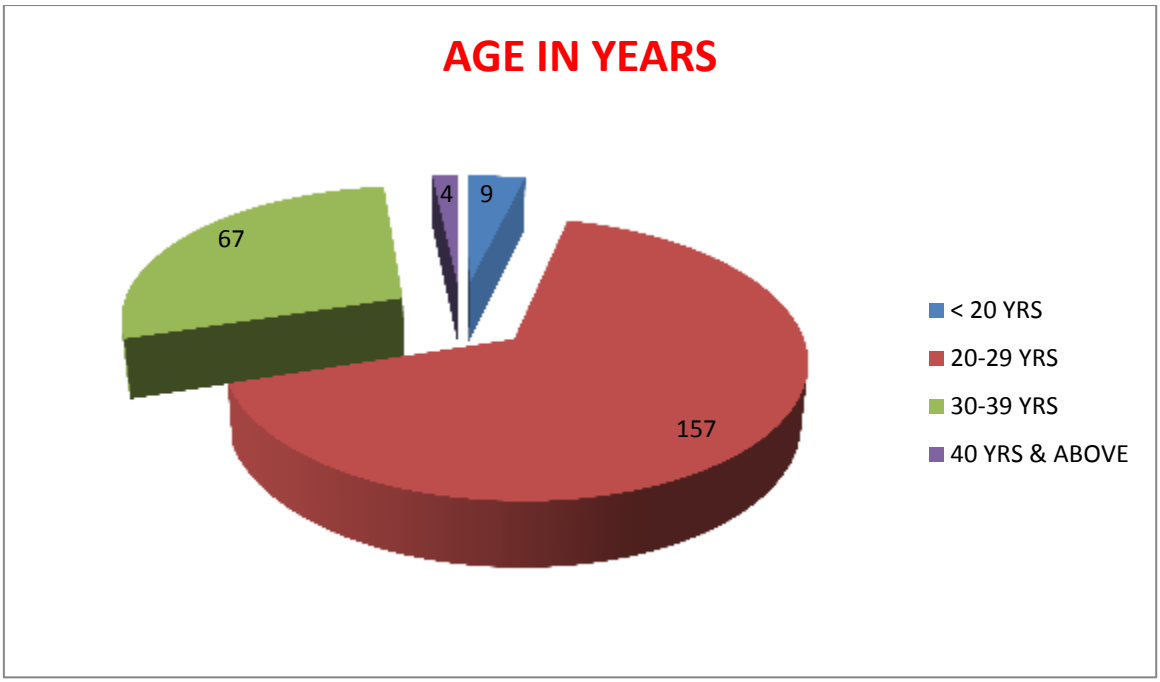
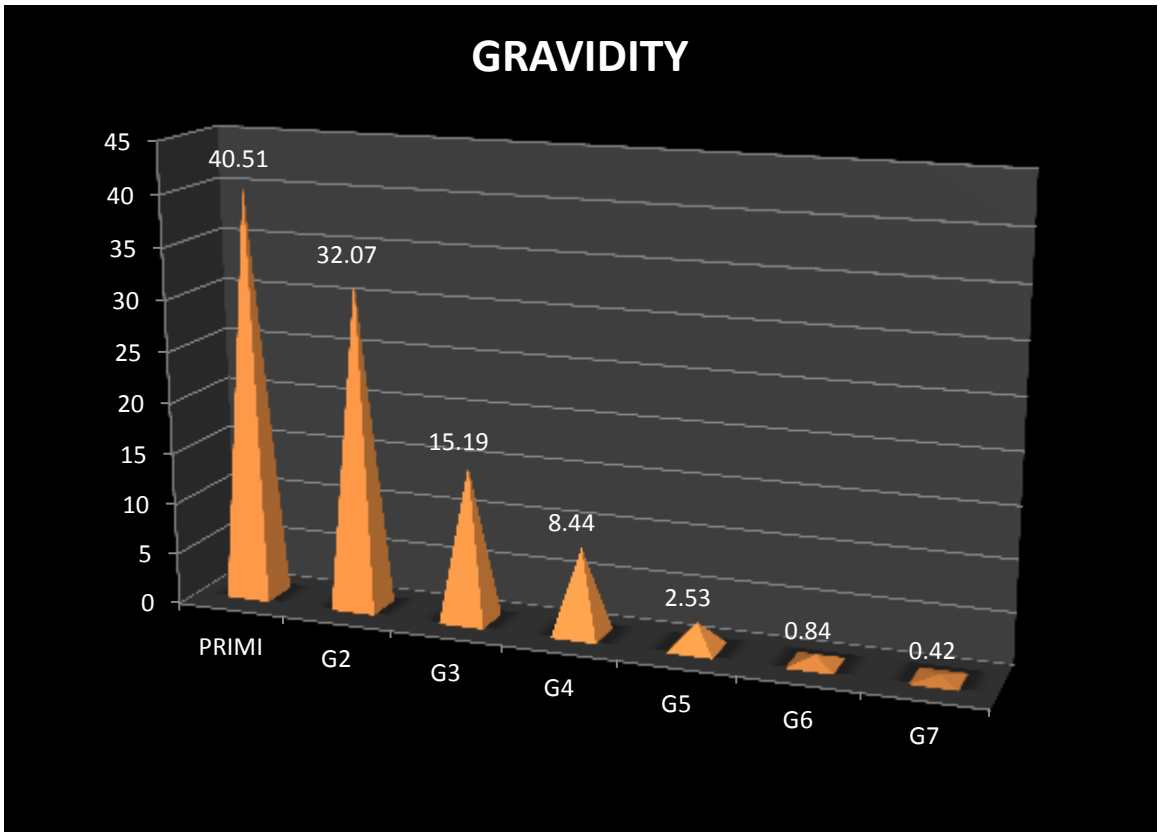


TABLE 2:141(59.49%) deaths were recorded amongst multigravidae females in comparison to 96(40.51%) amongst the primigravidae.



ISSN: 0975-3583,0976-2833 VOL13, ISSUE 05, 2022

Table 3: 222 (93.67%) mortality occurred in referred category of patients as against the figure of 15(6.33%) in registered patients.

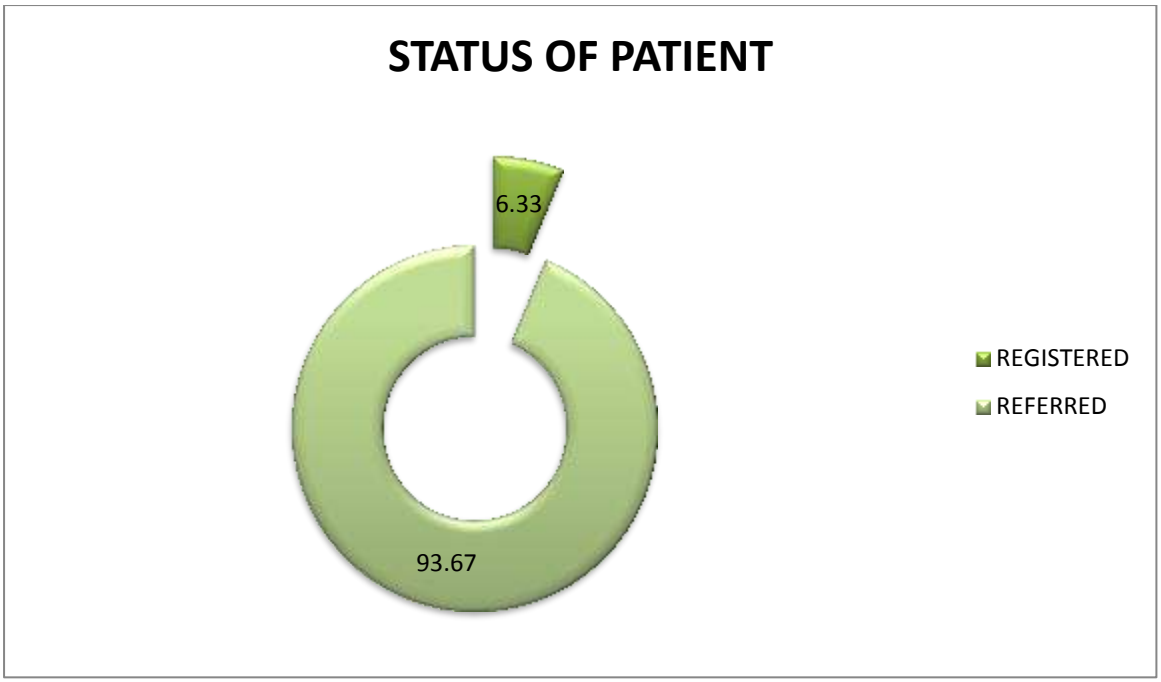
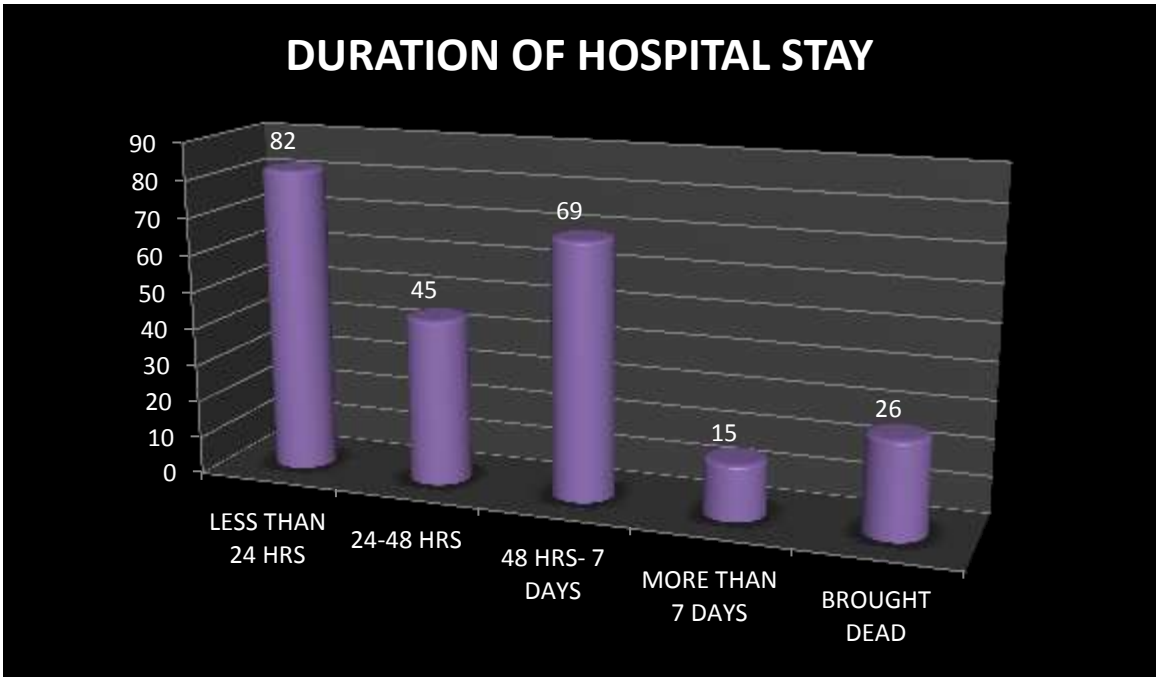


Table 4: The figure focuses on the time interval between arrival at the hospital and maternal death.

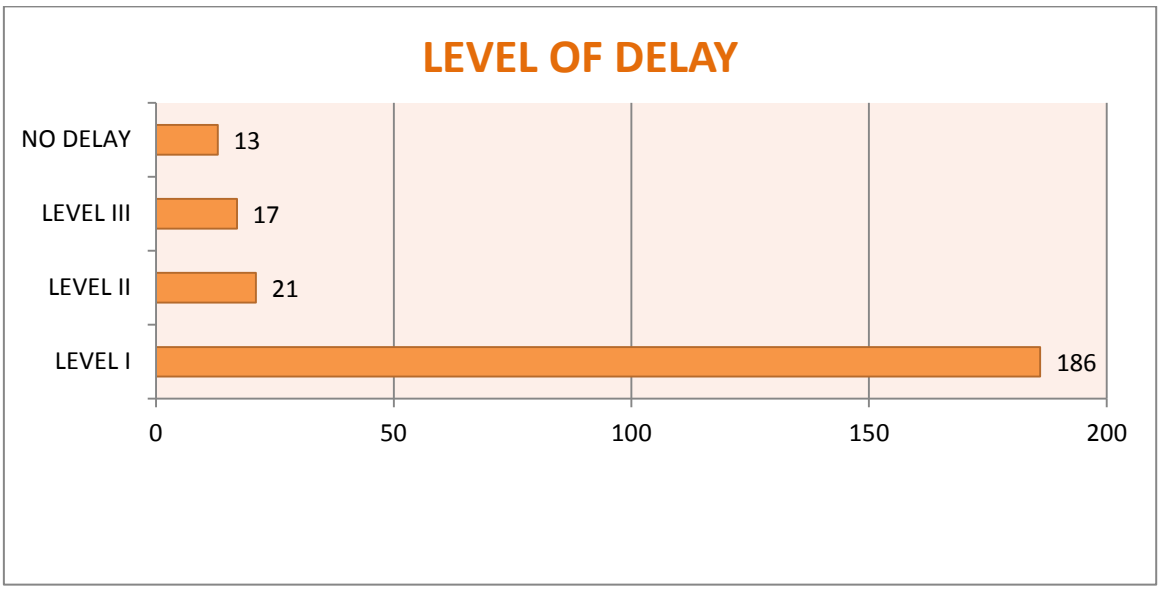


ISSN: 0975-3583,0976-2833 VOL13, ISSUE 05, 2022

Table5: Causes of maternal mortality according to WHO ICD- 10 MM (5)

Groups According To ICD 10 code	Type And Group	No. Of Maternal Deaths (%)
1	Direct: Pregnancies with abortive outcome	7 (2.95%)
2	Direct: Hypertensive Disorders of Pregnancies	61 (25.74%)
3	Direct: Obstetrics hemorrhage	33 (13.92%)
4	Direct: Pregnancies related Infections	15 (6.33%)
5	Direct: Other obstetrical complications(Embolism, Inversion, complications of Surgery ……)	10 (4.22%)
6	Direct: Unanticipated complications of anesthesia	0
7	Indirect: Non Obstetrics complications Respiratory Diseases Digestive System Diseases(e.g.Hepatitis) Cardiac Diseases Infections not direct result of Pregnancy CNS Complications (Epilepsy, Meningoencephalitis ……) Anaemia Genito-Urinary System Diseases	 42 (17.72%) 32(13.50%) 8 (3.38%) 6 (2.53%) 5 (2.11%) 4 (1.69%) 1 (0.42%)
8	Unspecified : Unknown/Undetermined	13 (5.49%)
9	Coincidental Causes	0

Table 6: Highlights the level of delay that contributed towards the loss of maternal life.



ISSN: 0975-3583,0976-2833 VOL13, ISSUE 05, 2022

Discussion

Maternal mortality is an index of the reproductive health of the society. A high incidence of maternal mortality throws a question onto maternal services being provided by the health sector and also happens to reflect the low socio-economic status of the community.The Government of India is a signatory of the United Nations (UN) Sustainable Development Goals (SDG) which adopted global MMR target of lesser than 70 deaths per lakh live births by 2030.

In this study, majority of the deaths,157(66.24%) were recorded in the age group 20-29 years.. Similar findings of maximum maternal mortality of 58% being confined to the age group 20-29 years were seen in study by C meh et al. (6).This age group being the peak of the reproductive years in the lifespan of a woman.

141(59.49%) multigravidae deaths were noted in comparison to 96(40.51%)primigravidae deaths which conform to the findings of the study by Suresh A et al(7) who recorded 61.5% deaths in multigravidae and 38.4% amongst the primigravidae.3(1.27%) deaths of grand multipara (=/> Gravida 6)were put on record in our study. Septic abortion formed the underlying cause of the death in 2 of these deaths and severe anaemia invited complications with the resultant death of a G7P6L4 woman who had not sought any antenatal check up until the arrival at our hospital where she had presented with failure. Each maternal death needs to be acknowledged; for life of every mother counts. More stress needs to be laid on to contraceptive counselling both during antenatal and postnatal period. Women need to be aware of their reproductive rights and to seek terminations only at a legalised centre in accordance with the MTP Act of the country which has been enacted to safeguard the health of the women at large rather than seeking these services from untrained and unauthorised persons.

Table 3 depicts that 222 (93.67%) cases of maternal death had been referred from other public/private health facility or had reported on their own at our hospital when the symptoms of complication had set in. These figures stresses upon the need for optimum antenatal check-ups, screening for high risk pregnancy, early referrals of such patients in whom tertiary level care requirement is self evident and adequate support during the transit to the higher health facility.

Table 4 throws light on to the time leading to maternal death since her arrival at the hospital. 26(10.97%) maternal deaths were recorded as brought dead along with the figure of 82 (34.60%) maternal deaths having occurred within 24 hours of arriving at the tertiary care centre. This finding is an indirect pointer towards the serious maternal condition by the time she was brought to the higher institution. Some of these patients reached our institution after being taken to one or two other health facilities from where they were further referred. The need of the hour is to understand the referral scenario which has to be individualised for each patient as not all health facilities across the state are equipped with blood bank, ICU facility, emergency obstetric care and trained manpower. This often results in the patient being referred from one facility to another, thus leading to a delay in initiation of the treatment. Inadequate support during the transit cannot be overlooked especially in cases where patient has been referred from a far off health facility.

In the present study 53.16% of maternal deaths were due to direct obstetrics cause. Amongst these hypertensive disorders of pregnancy accounted for maternal mortality in 61(25.74%)

ISSN: 0975-3583,0976-2833 VOL13, ISSUE 05, 2022

cases and obstetrical haemorrhage culminated in 33(13.92%) maternal deaths. A study done by Khandale et al. reported eclampsia and pre-eclampsia (28.19%) and haemorrhage(10.25%) as underlying cause for maternal deaths which is close to our results.(8)

Amongst the indirect obstetrics cause of maternal mortality, respiratory tract infections were implicated in 42(17.72%) maternal deaths. This could be attributed to the outbreak of Covid pandemic in the years 2020- 2021 when 21(8.86%) Covid +ve pregnant women lost their life at our institute during the study period. Digestive system complications were implicated in 13.50% maternal death. Anaemia was implicated as the primary cause in 1.69% of maternal mortality which is similar to the findings of 1.24% in the study carried out by Basu et al(9). On further analysis of the data, anaemia was found to have acted as a contributory factor in 69 (29.11%) maternal deaths. This highlights the need to correct anaemia at the earliest. Other medical causes of maternal demise in our study included: Cardiac disease (3.38%), complications with origin in the CNS (2.11%), genitourinary system (0.42%). 5.49% of the maternal deaths occurred on account of infections that were not direct result of pregnancy. In cases of maternal death, where the cause was not itself evident from the referral slip (especially in those patients who were brought dead), the departmental maternal review committee had consensually agreed to obtain the consent from the relatives for getting the post-mortem done. But consent was not given many a times.13 (5.49%) maternal deaths remained unspecified.

186(78.48%) of maternal deaths happened in those pregnant females who either had not registered themselves for antenatal care or where the warning signs of underlying disease were ignored for too long and this led to delay in their seeking care (Level I delay).Here, the role of the patient and her relatives is of paramount importance in ensuring her well being. 21(8.86%) mothers lost their life on account of Level II delay. This delay was more evident in cases that were referred from far off health facilities. Hence, the support to the patient during the transit is equally important. Another Indian study by Khandale et al.(8) also reported a Level I delay (85.89%) and Level II delay (10.25%) respectively. Upgradation of the of the existent peripheral health facilities in terms of infrastructure, posting of specialist doctors along with trained manpower in adequate number would serve to bring down the figure of Level III delay(7.17%) as some of the maternal lives could have been saved if these complications had been dealt at the site of the referring health institution. If that is not feasible, then after stabilising the patient, referral should be straightaway to the appropriate higher health facility (as per the clinical status of the patient) rather than the patient moving across various hospitals. This would ensure early initiation of the treatment and prevent the further damage to the health of the patient once the complication sets in.

Conclusion

Maternal mortality is largely preventable. It requires collaborative efforts from the community and the health personnel. To further lower the maternal mortality figures: regular antenatal care, screening for high risk pregnancy, early referral, institutional delivery, postpartum follow up needs to be ensured for each pregnant female. Adequate support during the referral transit period should be in place. Family planning and comprehensive abortion care awareness needs to be spread amongst women of reproductive age group. Upgradation of peripheral health facilities in terms of both infrastructure and manpower would guarantee

ISSN: 0975-3583,0976-2833 VOL13, ISSUE 05, 2022

early initiation and in-house treatment and serve to safeguard the life of a woman who was looking forward to embrace motherhood.

Author's contributions

AKR and KKS conceptualised the idea,collected data and drafted the manuscript. AKD revised the manuscript for intellectual content. All the authors approved the final version of the manuscript.

Funding

Nil

Conflict of interest

The authors declare that they have no conflicts of interest.

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