A study on maternal mortality in a tertiary care center in South India

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Abstract

Introduction: Maternal mortality has long been considered as a very good indicator for healthcare quality provided. Pregnancy is considered to be a physiological phase in the lifetime of a woman carrying serious implications on morbidity and mortality. It has been agreed upon that many of the maternal deaths in developing countries can be prevented.

Aim: To study the prevalence of maternal mortality between March 2014-March 2018 in our hospital.

Methods and Materials: It's a retrospective observational study done at a tertiary care centre in southern part of India. Maternal deaths from March 2014 to March 2018 were looked into. Maternal mortality ratio and causes for the maternal deaths were analyzed and compared. Demographic details were collected and data regarding parity, mode of delivery, gestational age at delivery, antenatal check-ups, co morbid conditions, causes of death were noted and neonatal outcomes were noted.

Results: Overall live births in the period between March 2014-March 2018 were 18978, of which the number of LSCS were 9590(50.5%), the number of vaginal deliveries were 9388(49.5%), the number of maternal deaths were 39(MMR-205/100000 live births).The leading cause was sepsis 48.6% followed by postpartum hemorrhage (20%). The most common indirect cause was anemia (42.85%).

Conclusion:

Sepsis & hemorrhage emerged as the greatest killers. Many of the reasons of maternal mortality were found to be preventable. Early identification and stratification of risks with prompt initiation of necessary management measures are necessary to prevent these deaths.

Keywords: Maternal mortality, Sepsis, hemorrhage, preeclampsia, direct cause, indirect cause

Introduction

"Maternal death is defined as the 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 the pregnancy or its management, but not from accidental or incidental causes".[1] Maternal death is a heavy loss to the family and society. Maternal mortality reflects the health care facilities available to the community. In India maternal mortality statistics has been showing a decreasing trend.[2] It was at an alarming rate of 677 per one lakh live births in 1980, which fell to 174 per one million live births in 2015,[3] still it is on a high.

In 2015 globally 303,000 women died of various causes related to maternity.[4] It has been learned that in Northern Europe the risk of a woman dying because of pregnancy and childbirth in her lifetime is about 1 in 30,000 where as in Afghanistan is about 1 in 6.[5] National rural health mission (NRHM) and Millennium development goal's target is to reduce MMR to less than 100 by 2015in India.[1] This was not achieved despite countless measures.

In India the numbers vary drastically from region to region. Socio demographic factors also cast a major influence. A wide variation in the maternal mortality rate has been shown by various studies done in India in the last 15 years ranging from 47/100000 to 625/100000.[6] "What was significant is the data from the state of Karnataka :maternal mortality rate in the state has decreased from 144 in 2011-13 to 134 in 2017-18."[3]

Mortality occurring due to complications related to pregnancy, labor and the puerperium, which can be due to commission and omission of interventions, injudicious treatment or may be due to combination of these factors is termed as the direct causes of obstetric death. Deaths as a result of previously existing condition or a disease, that first occurred during pregnancy which are not direct obstetric causes.[7] Indirect causes of maternal mortality can be worsened by physiological changes of pregnancy. Maternal deaths are most commonly caused by complications associated with pregnancy or delivery or a combination of both.[8] These complications include hemorrhage, unsafe abortions, infections postpartum, hypertensive disorders during pregnancy, obstructed labour etc which accounts for more than 75-80% of direct maternal deaths.[9] The risk multiplies when more than one factor is involved.

Pregnancy is not a disease but a physiological state; hence pregnancy related mortality is almost always preventable.[10] But this demands a great amount of effort and caution from us. We need to have more of institutional data to pin point the various lacunae that led to the increase in maternal mortality over the years in this southern state of India.

The purpose of orchestration of this study is to determine the magnitude of maternal mortality and the various factors contributing to it in our tertiary care centre.

Aim

To study the prevalence of maternal mortality during March 2014-March 2018 in a tertiary care centre.

Materials and Methodology

Study setting

Government Lady Goschen Hospital Mangalore and KMC Hospital, Attavar, Mangalore.

It is a retrospective observational study done in a tertiary care centre in Dakshina Kannada district of Karnataka, India. Maternal deaths from March 2014 to March 2018 were studied. Maternal mortality ratio and causes for the maternal deaths were analysed and compared. Demographic details were noted including age, parity, mode of delivery, gestational age at delivery, antenatal checkups, pregnancy related complications, long standing co morbid conditions, causes of death and neonatal outcomes were noted.

Results

Overall live births in the period between March 2014 to March 2018 were 18978, of which the number of LSCS were 9590 and remaining were vaginal deliveries, the number of maternal deaths were 39(MMR-205/100000 live births). Highest mortality was recorded in the months of October, (6) November (5) and December (8).

Maximum number of mortality was in the age group of 26-30 years (48.7%). Fifteen (38.4%) of the 39 were primigravida and remaining (61.5%) were multigravidas.

Among the 39 maternal deaths, 46% had vaginal delivery and 46% had lower segment caesarean section and 3 patients were not delivered (7.7%). 46% (18) delivered after term gestation. 79.4% had regular ANCs. 35.9% had co morbid conditions of which anemia constituted the majority i.e., six mothers (42.85%). The number of mothers who had regular antenatal care and delivered in our hospital were sixteen patients (41%), antenatal care elsewhere and delivered in our set up were 13(33.3%), antenatal care and delivery elsewhere and referred to our centre were 6 (15.38%) and those with no antenatal care were 4(10.2%).

Direct causes that resulted in maternal deaths were thirty five (89.7%). Sepsis proved to be the biggest contributor to maternal mortality in our centre, resulting in seventeen (48.6%) maternal deaths followed by postpartum hemorrhage and amniotic fluid embolism which caused seven (20%) and four (11.4%) maternal deaths respectively. Venous thromboembolism and ante partum hemorrhage resulted in one death (2.85%) each. Eclampsia resulted in two deaths (5.7%). Indirect causes leading to maternal death were Guillain-Barre syndrome, peripartum cardiomyopathy, pulmonary artery hypertension and carcinoma breast with extensive metastasis each resulting in one maternal death each. Of the mothers who died fourteen (35.9%) had chronic co morbid conditions of which anemia was identified to be the most prevalent with six (42.85%) mothers featuring anemia followed by diabetes (14.3%) and chronic hypertension (14.3%)

Of the 39 maternal deaths that occurred, 25(64%) had surviving live births without any complications or needing management in a neonatal intensive care unit, 13(33.3%) were intrauterine deaths/ still born and one neonatal death (2.56%).

Table 1: Observed co morbid conditions in the mothers who died (in percentage).

Comorbidity	N	Percentage
Chronic hypertension	2	14
Gestational diabetes	2	14
Anemia	6	43
Depression	1	7
Malignancy	1	7
Cardiac disease	1	7
thyrotoxicosis	1	7

Table 2: Causes resulting in maternal mortality

Cause	N	Percentage
Direct	35	90
Indirect	4	10

Table 3: Direct causes resulting in maternal mortality

Cause	N	Percentage
Amniotic fluid embolism	4	11
Venous thromboembolism	1	3
sepsis	17	49
Eclampsia	2	6
Antepartum haemorrhage	1	3
Postpartum haemorrhage	7	20
metastasis	1	3
Cardiac cause	2	6

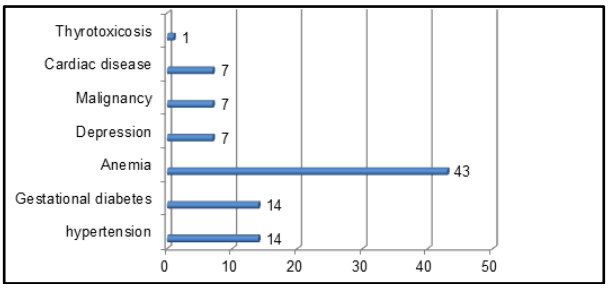

Fig. 1: Co-morbidities in pregnancy".

Discussion

In this study majority of the deaths belonged to 26-30 years age group, which can be due to the social situation seen in our community, where most of the pregnancies happen in this age group. At the same time it is noteworthy that teenage pregnancies and advanced maternal age did not pose a major threat to maternal health at least in this study setting in the prescribed time period. This is due to the decreased rate of teenage pregnancies in this part of Karnataka. It is in contradiction to the findings in many other studies.[11] In the National representative survey between 2001-2003 by the registrar general of India of the 1096 maternal deaths (which accounted for 11.9% of all deaths of women in the age group between 15-49 years), half the deaths were in the age group of 20-29 years with a median age of 26 years.[12] This is similar to the observation made in this study.

The caesarean section rate in our hospital during the study period was 50.5%(9590). This is about five fold

higher than the national average of 10 %.[7] This could be mainly associated with the fact that our hospital is a tertiary care centre with most of the cases being referred here for various complications. The lower segment caesarean section rate among the mothers who died was 18(46%) and remaining had vaginal deliveries 18(46%) and 3 were not delivered (7.7%). None of the deaths resulted as a direct consequence of the surgical complications. None of the studies have compared the mode of delivery conducted and its relation with maternal mortality.

46% of the deaths occurred at term gestation, this is comparable to other studies where most of the complications leading to maternal mortality arose at term gestation. A study by Pratima devi et al had shown that majority of death had occurred at term (57.5%)[16] which is comparable to this study.

The number of mothers who had regular antenatal care and delivered in our hospital were sixteen (41%), ante natal care elsewhere and delivered in our set up were 13(33.3%), antenatal care and delivery elsewhere and referred to our centre were six (15.38%) and those with no antenatal care were 4(10.2%). It was noted by Montgomery et al that mothers who had more than one antenatal visit was about 58.3% which is comparable in this scenario[7]. This undermines the importance of regular and meticulous antenatal care with deep insight into any associated high risk factors which plays an important role in prevention and early identification of complications leading to maternal deaths.[13]

In our study direct causes that resulted in maternal deaths were thirty five (89.7%). Sepsis proved to be the biggest contributor to maternal mortality in our centre, resulting in seventeen (48.6%) maternal deaths followed by postpartum hemorrhage and amniotic fluid embolism which caused seven (20%) and four (11.4%) maternal deaths respectively. Venous thromboembolism, metastasis and ante partum hemorrhage resulted in one death (2.85%) each. Eclampsia resulted in two deaths (5.7%). This finding agrees with most of the other studies as well as the general consensus in this regard. One such study observed that more than one fourth of the maternal deaths were due to obstetric hemorrhage (n = 296) with most occurring in the intrapartum period (n =258) followed by sepsis (n=184).[7] A study done by Abilasha et al showed that 67.7% of maternal deaths are due to direct causes and common direct causes encountered where hemorrhage (33.8%),eclampsia (10.3%) and sepsis (8.2%).[17] This data is not corresponding to what we have seen in this particular study.

Indirect causes leading to maternal death in our study were Guillain Barre Syndrome, peripartum cardiomyopathy, pulmonary artery hypertension and carcinoma breast with extensive metastasis each resulting in one maternal death each. These conditions may vary from place to place and time to time. These conditions need multi-disciplinary involvement for adequate management and do not always limit itself to obstetric management alone.[14] Pratima et al have found higher incidence of cardiovascular causes as major indirect factor which could not be elicited in this study.[16]

We found that fourteen (35.9%) of the mothers who died had chronic co morbid conditions among which anemia was identified to be the most prevalent with six (42.85%) mothers featuring anemia followed by diabetes (14.3%) and chronic hypertension (14.3%). It has to be noted that despite the multiple programs by the central and state Government anemia still has high prevalence and poses a great threat to maternal health.[15] we have found an higher prevalence of anemia in mothers who died when compared to studies done by Pratima et al (15%)[16] and Abilasha et al (14.7%).[17]Anemia is one condition which can be the causative factor for almost all obstetric complications leading to maternal death. As previously discussed, regular antenatal care can alleviate the burden of anemia in mothers who are at high risk developing anemia.

Conclusion

1. Maternal mortality ratio in our hospital is 205 which is quite high. This is probably because our hospital is a tertiary care centre where many cases are referred in view of complications.
2. Sepsis is the major cause and more emphasis should be put on undertaking all the necessary measures for asepsis.
3. Timely referral to tertiary care centers should be encouraged in primary health care facility.
4. Regular maternal death reviews need to be conducted to look into the causes and take necessary steps to prevent them in future.

Conflict of Interest: None.

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