



A 10 Year Retrospective Study of Maternal Mortality in A Tertiary Care Centre in North Kerala

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ABSTRACT

Retrospective study of maternal mortality was conducted in Dept of Obstetrics and Gynecology in ACME Pariyaram. Previous records of maternal deaths during period of 10 years (2006-2015) were reviewed in detail. The parameters studied were Age & parity, Booked / emergency, Referred / not referred, Gestational age, Admission to death time interval, Delivery to death time interval, Cause of death. The main causes are haemorrhage (25.5%), hypertensive disorders(16.2%) , heart disease(13.9%) , sepsis(9.3%), amniotic fluid embolism(9.3%)

KEYWORDS

maternal mortality, PPH, hypertensive disorders

Introduction

Before you were conceived I wanted you
 Before you were born I loved you
 Before you were here an hour I would die for you
 This is the miracle of life
 -Maureen Hawkins

The objective of obstetrics is that every pregnancy should culminate a healthy mother in possession of a healthy baby. Each year more than half million women and over 10 million children die largely from preventable causes. The world health organization commemorated world health day 2005 in Delhi by launching world health report which featured the theme " make every mother and child count".¹ No society can be proclaimed to be healthy , unless mother is healthy, since she is the backbone of society.

Globally there were an estimated 2.87 lakh maternal death in 2010 yielding a MMR of 210/ 1 lakh live birth. Global adult lifetime risk of maternal mortality is 1 in 180 ². Developing countries account for 99% of global maternal deaths Sub Saharan Africa and southern Asia account for 85 %. MMR in developing regions was 15 times higher than in developed regions² . At country level two countries account for one third of global maternal deaths: India at 19% and Nigeria at 14%.

As per the latest MMEIG report india is ranked 126 out of 180 countries in MMR. India accounts for the maximum number of maternal deaths in the world — 17 per cent or nearly 50,000 of the 2.89 lakh women who died as a result of complications due to pregnancy or childbearing in 2013 ³.

Maternal mortality is only the tip of the iceberg of maternal morbidity and women's suffering. For every death of a woman there are 10 more who are left with morbidities of various kinds. Maternal death audits form the mainstay of evaluation of maternal health services in developing countries.

Definitions

Maternal mortality

Defined as per WHO (1CD-10) as the death of woman while pregnant or within 42 days of termination of pregnancy irrespective of duration and site of pregnancy , from any cause related to aggravated by the pregnancy or its management ,but not from incidental or accidental cause ⁴.

As per ICD – 10, cause of maternal death are divided into Direct&Indirect obstetric deaths

Direct obstetric deaths

Direct obstetric deaths are those resulting from obstetric complications of the pregnant state (pregnancy , labour and puerperium) from interventions , omissions , incorrect treatment , or from a chain of events resulting from any of the above

Indirect obstetric deaths

Indirect obstetric deaths are those resulting from a previously existing disease or diseases that developed during pregnancy and which are not due to direct obstetric causes ; but which are aggravated by physiological effects of pregnancy

Late maternal death

Death of a woman from direct or indirect obstetric causes more than 42 days but less than 1 year after termination of pregnancy

Pregnancy Related Death

Death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of cause of death

Patients and methods

Retrospective study of maternal mortality was conducted in Dept of Obstetrics and Gynecology in ACME Pariyaram. Previous records of maternal deaths during period of 10 years were reviewed in detail. The parameters studied were Age & parity, Booked / emergency, Referred / not referred, Gestational age, Admission to death time interval, Delivery to death time interval, Cause of death.

Results

There was a declining trend in the total maternal deaths over a period of 10 years from 2006 to 2015. Maximum deaths were in 2006 (9) and minimum in 2015 (nil). Year wise break up of mortality is shown in table 1.

Table 1 about here

Most number of deaths were in the age group 21 – 30 years. The maximum mortality was in the subgroup of 26 to 30 years (39.5%). 20- 25 year age group contributed to 34.8% of cases of mortality as depicted in table 2.

Table 2 about here

More than half of maternal deaths were primi gravidas. Majority (57%) were term pregnancies. 20% were in antenatal period. Most number of deaths occurred in first 6 hours of admission. Majority of cases mode of delivery was emergency caesarean section.

Among causes of death PPH contributes maximum with atonic PPH in most cases as depicted in table 3 and 4. Rest of the causes were hypertensive disorders, heart disease, sepsis, amniotic fluid embolism, pulmonary embolism, ARDS and other causes.

Table 3 about here

Table 4 about here.

Discussion

There are three main measures of maternal mortality – maternal mortality ratio, maternal mortality rate and life time risk of maternal death. Maternal Mortality Ratio represents the risk associated with each pregnancy, i.e. the obstetric risk. It is calculated as the number of maternal deaths during a given year per 100,000 live births during the same period. Maternal mortality rate measures both the obstetric risk and the frequency with which women are exposed to this risk. It is calculated as the number of maternal deaths in a given period per 100,000 women of reproductive age (usually 15-49 year). The terms ratio and rate are often used interchangeably; for the sake of clarity it is therefore essential when referring to either of these measures of maternal mortality, to specify the denominator used. Life time risk of maternal death takes into account both the probability of dying of the pregnancy cumulated across a women's reproductive years. Lifetime risk can be calculated.⁵

Approaches for measuring maternal mortality are civil registration system, household surveys, census, RAMOS, verbal autopsy. Civil Registration System involves routine registration of births and deaths. Ideally, maternal mortality statistics should be obtained through civil registration data with good attribution of cause of death provides accurate data on the level of maternal mortality and the causes of maternal death. In countries with incomplete civil registration system, it is difficult to measure accurately the levels of maternal mortality.⁶ Household Surveys obtains information by interviewing a representative sample of respondents about the survival of all their siblings (to determine the age of all siblings, how many are alive, how many are dead, age at death and year of death of those dead, and among sisters who reached reproductive age, how many died during pregnancy, delivery, or within two months of pregnancy).⁷ Census with the addition of a limited no of questions, could produce estimates of maternal mortality. This approach eliminates sampling errors (because all women are covered) and hence allows a more detailed breakdown of the results, including trend analysis, Geographic subdivisions and social strata. Reproductive – age mortality studies (RAMOS) involves identifying and investigating the causes of all deaths of women of reproductive age in a defined area/population, by using multiple sources of data eg: Interviews of family members, civil registrations, health facility records, burial records, traditional birth attendants.⁸ Verbal Autopsy is used to assign causes of death through interviews with family or community members, where medical certification of cause of death is not available.⁹

Globally, there were an estimated 287 000 maternal deaths in

2010, yielding a MMR of 210 maternal deaths per 100 000 live births among the 181 countries. Developing countries account for 99 % (284 000) of the global maternal deaths. The majority of which are in sub-Saharan Africa (162 000) and southern Asia (83 000). These two regions accounted for 85% of global burden, with sub-Saharan Africa alone accounting for 56 %. The MMR in developing regions (240) was 15 times higher than in developed regions (16)

Causes of maternal death in Kerala

In Kerala, from 1st January 2004 onwards Kerala Federation of Obstetrics & Gynecology (KFOG) started a new approach - confidential Review of Maternal Death, similar to that of CEMD of U.K. First report on this series published in 2009¹⁰, which included review of maternal death during 2004-2006. Reliable data about causes of maternal death is available from CRMD report for the period of 2006-2009 (second report). During this period there were 676 maternal deaths (excluding late maternal death), Out of these 313 cases were analyzed by CRMD. The main causes are haemorrhage, hypertensive disorders, sepsis, heart disease, amniotic fluid embolism, respiratory disorders, hepatic diseases, renal diseases and thrombo embolism

Our study was conducted during the years 2006- 2015 in tertiary referral hospital (ACME Pariyaram). This hospital is the sole for large chunk of population over the Northern Malabar including the poor rural women and the tribal mothers. MMR was highest in 2006 among studied years and had a declining trend. Most vulnerable group was 21-30 years & primi gravidas. All were referred cases. Maternal mortality in booked cases were nil over the last 10 years. Antepartum deaths were 20 %. Around one fourth of deaths were in the first 24 hours of admission.

Post Partum hemorrhage (PPH) is the most common direct cause of death. Around a quarter of deaths are still due to PPH. Out of 43 maternal deaths 11 were (25.5%) were due to PPH, out of which 72 % cases were atonic PPH and rest were traumatic. In the study by KFOG of the 676 cases 19.38% death were due to obstetric hemorrhage. Out of the 75 cases analyzed by CRMD 60 them were due to PPH (43 atonic, 17 traumatic), 8 were due to abruption, 2 due to placenta previa and 5 due to placenta due to placenta previa accreta.

Hypertensive disorders contributed 16.2 % (7) of cases and there was a declining trend over the years in hypertension related deaths. In KFOG study second cause of death was hypertensive disorders (12%). Preeclampsia and eclampsia continues to be a major killer of pregnant women in Kerala. Out of these cases 24% patients had multi organ dysfunction. Multiorgan dysfunction is the final common pathway for many other causes of maternal death, especially hemorrhagic causes.

Heart diseases accounts for 13.9 % of maternal death. There is change in type of cases from previous reports, instead of rheumatic heart disease (RHD) congenital heart disease (operated or not operated) and patients with prosthetic heart valves contributed maximum cases. These are the patterns likely to persist in future with improvement in medical care and it brings new challenge in approach as most of them will be on anticoagulants (post surgical cases).

Sepsis is the fourth most common cause of maternal death accounting for 9.3% of total. In the KFOG study it was third cause of death. It was in the 12th position in 2004-2006 CRMD report. The major concern is that, multidrug resistant of bacteria are reported from intensive care unit all over the world. Some cases had very rapid progression ending in shock and DIC. The importance of prevention is all the more in our set up because most of our patients cannot afford very expensive antibiotics.

9.3 % of cases were due to amniotic fluid embolism, and same percentage were due to pulmonary embolism, ARDS. 3

maternal deaths were due to other causes: neurological causes (spinal tumor), RTA and G.I. bleed.

Conclusion.

Reviewing maternal death over last 10 years , it is evident that better hospital care and health care facilities have helped in reducing the mortality rate. Further reduction requires carrying essential obstetric care to remote and rural areas. Provision of transport facility is a must to the smallest unit like of health service and referral hospitals like DH should be equipped with blood transfusion facilities , anaesthesia , proper equipments and trained paramedical staff.

YEAR	NO OF DELIVERIES	NO OF DEATH
2006	1122	9
2007	1068	7
2008	1053	6
2009	1199	4
2010	1295	6
2011	1384	2
2012	1566	2
2013	1692	4
2014	1832	3
2015		

Table 1

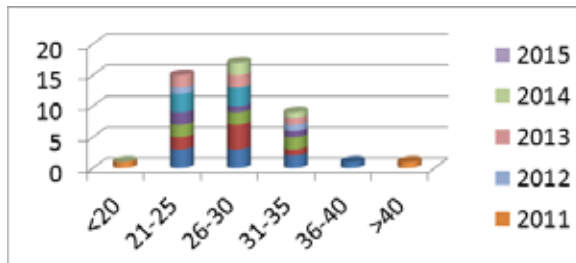


Table 2

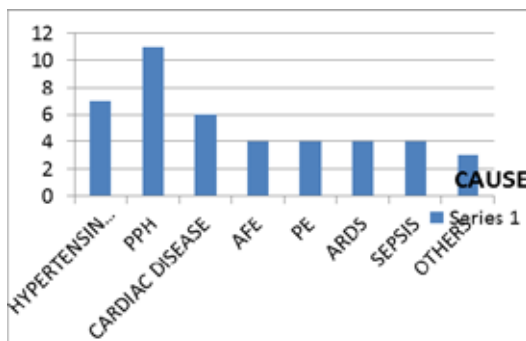


Table 3

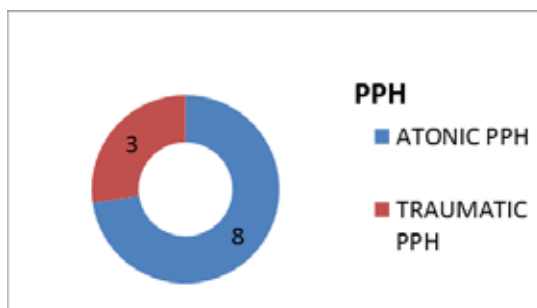


Table 4

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