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MATERNAL MORTALITY: TEN YEARS REVIEW STUDY AT GOA MEDICAL COLLEGE THE ONLY MEDICAL COLLEGE & TEACHING INSTITUTE IN THE STATE OF GOA

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ABSTRACT: Objective: Maternal Mortality: Ten year review study in The Department of Obstetrics and Gynecology, Goa Medical College. **Method:** A retrospective study was conducted in the Dept. of OBG GMC over a period of10 years spanning between Jan 4 to Dec 13 regarding Maternal Mortality. **Results:** There were total of 58 deaths out of 54604 live births during this 10 year period giving maternal mortality ratio(MMR) of 106.15/ 100000 live births which is 50% less as compared to MMR in India(212 maternal deaths/100,000 live births). In last 2 years i.e. in 2012 and 2013 it has come down 86.35-94.46 maternal deaths/100,000 live births, thus already reaching MDG 5 of WHO Referral cases accounted 87.85%. The majority of cases were in 21-30 year age group (93.2%) and mostly they were primigravida (55.1%). Hemorrhage (29cases) was the commonest cause of death followed by pregnancy induced hypertension (26cases). **Conclusion:** Hemorrhage (PPH, accidental hemorrhage, ruptured uterus), pregnancy induced hypertension including eclampsia, HELP Syndrome, Sepsis and DIC were found to be the direct major causes of death. Anaemia, cardiac disease, hepatitis etc. were other indirect causes of death. So if India has to achieve Millennium Development Goal of slashing the MMR by three quarters by 2015 then determinants of maternal mortality need to be identified and tackled on priority basis. Sustained reduction in maternal mortality will only be possible if modern high quality obstetric care is made available to all women through a system of professional midwifery and referral hospital care in the context of political commitment and accountability of health providers.

INTRODUCTION: A woman is the one who can take the place of all others, but whose place no one else can take and so the pregnancy care should culminate in healthy mother with a healthy baby. Maternal mortality ratio is a vital index of the effectiveness of prevailing obstretic services and socioeconomic affluences of a country.

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Various social, cultural and political factors determine the status of women, their health, fertility and health seeking behavior.

Maternal death is defined and classified according to WHO's International Classification of Diseases, 10th version (ICT-10). It states that, maternal death is the death of a woman while pregnant or within 42 days of the termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause to or aggravated by the pregnancy or its management but not from accidental or incidental causes [2]. Maternal mortality ratio is defined as number of maternal deaths per 100,000 live births during a given period. Maternal mortality differs from place to

place, country to country and institute to institute reflecting the type of care provided and health status of that regionThe lifetime chances of maternal death in the world in 2010 as a whole is about 1 in 80. It varies from region to region and from country to country. In the least developed countries the chances are about 1 in 37, in the developing countries about 1 in 150 and in the industrialized countries about 1 in 3800. In Sub-Saharan region the chances are very high, about 1 in 39 pregnancies [3].

In India approximately 28 million women experience pregnancy and 26 million have live births. An estimated 67000 maternal deaths and 1 million new born deaths occur each year [4]. Millennium development goal 5 (MGD 5) aims at reducing MMR also by 75% over the period of 1990-2015. National Rural Health Mission (NRHM) and MDG5, target to reduce MMR to less than 100 by 2015. When we look back at the twentieth centurywe feel proud of the scientific discoveries and breakthroughs that have taken place globally, however unfortunately very little has been achieved as far as the women health care and social status especially in the developing world. With 16% of world`s population, India accounts for over 20% of world`s maternal deaths.

The MMR per 100,000 live births is estimated to be 920 in Africa, 330 in Asia and 10 in Europe[5]. MMR in India has declined from over 750 in 1960's to about 677 in 1980's and about 400 in 1990, 254 in 2004 – 2006 and 212 in 2007 – 2009 [1]. Up to 80% of these deaths are directly due to 5 complications i.e. hemorrhage, sepsis, PIH, ruptured uterus (obstructed labor) and complications of abortions. It is roughly estimated that once bleeding starts, death can occur in around 2 hours compared with 10 hours for eclampsia and 72 hours for obstructed labor [6]. For a single death which we see there are at least 30 suffer injuries and often permanent disabilities.

Evidence shows that maternal mortality can be reduced without first attaining high levels of economic development. In fact maternal mortality itself contributes to under-development because of its severe impact on the lives of children, the family and society in general.

MATERIAL AND METHODS:

All maternal deaths occurring in the department of Obstetrics and Gynecology attached to government medical college (Goa Medical College, Goa) over a span of 10 years (January 2004-December 2013) were analyzed retrospectively. Each medical record was scrutinized for age, parity, booked/un booked/referred cases, medico legal/non-medico legal, mode of delivery (spontaneous vaginal delivery/caesarian section), outcome of deliveries (live births, intra-uterine death/still births), cause of deaths and admission to death intervals etc. statistical analyses was carried out using standard error of difference of proportion method.

Observations:

TABLE 1: YEAR WISE MATERNAL MORTALITY RATIO

Year(Jan to December)	Maternal death	Live births	MMR(maternal death per 100000 live births)
2004	4	5200	76.92
2005	7	5334	131.23
2006	5	5299	94.35
2007	6	5377	111.58
2008	6	5445	110.19
2009	7	5589	125.25
2010	7	5488	127.55
2011	6	5789	103.64
2012	5	5790	86.35
2013	5	5293	94.46

It was observed from Table 1 that MMR ranges from 76.92 to 131.23 maternal death/lac live birth per year, and average is approximately 106.

TABLE 2: RELATION IN AGE AND MATERNAL DEATH

Age in years	No of Deaths	Percentage
20 and less	4	6.8%
21- 25	19	32.7%
26- 30	15	25.8%
More than 30	20	34.5%

It is evident from above **Table 2** that maternal deaths are almost equal after age of 20 years and even after 30 years of age with little drop in age group of 26-30 years which is not much significant. It is interesting to note that only 6% death is in age group of 20 and less, may be because of literacy awareness etc or those who conceive they undergo safe abortion mainly.

TABLE 3: RELATION BETWEEN PARITY AND MATERNAL DEATH

Parity	No of Deaths	Percentage
Primi	32	55.1%
Para 2	15	25.9%
Para 3 & above	11	19.0%

From **Table 2 & 3** it is evident that after age of 20, no of deaths were almost equal but primis were more vulnerable almost 55% as compared to para 2 & para 3 and above where deaths were 25.9% and 19% respectively. In other words we can say that nearly half of the deaths occur in primi (55%), thus reflecting vulnerability of first time mother hood.

Table 4: RELATION BETWEEN ANTENATAL CARE AND NO OF DEATHS

Antenatal Care	No of Deaths	Percentage
Referred cases	51	87 .9%
Booked cases	3	5.2%
Unbooked cases	4	6.9%

From **Table 4** it is very clear how important is proper antenatal registration care, as almost 90% (87.9%) deaths were in the referred group of patients. Only 3 patients (5.2%) have taken proper antenatal care from our institution while 4 were totally unbooked patients. Maximum number of deaths were among referral cases which were booked at other facilities and cases were referred late after onset of complications.

TABLE 5: CAUSES OF MATERNAL DEATHS

Factors Detected	No of Cases	Percentage
Post-partum haemorrhage	18	31%
Preeclampsia	14	24%
Disseminated intravascular Coagulation	12	20.6%
Sepsis	11	19%
Eclampsia	8	13.8%
Acute Kidney Injury	8	13.8%
Accidental hemorrhage	7	12.1%
Severe Anaemia	7	12.1%
HELLP Syndrome	4	7%
Rupture Uterus	4	7%
Amniotic Fluid Embolism	3	5.2%
Psychiatric Illness	2	3.2%
Intracranial Bleed	2	3.2%
Acute Fatty Liver	2	3.2%
Peri-partum Cardiomyopathy with ischemic encephalopathy	1	1.7%
Congenital Heart Disease (ASD) With CCF	1	1.7%
Pulmonary Embolism	1	1.7%
Pulmonary Oedema	1	1.7%
Jaundice	1	1.7%
Hepatitis	1	1.7%
Hepatic Encephalopathy	1	1.7%
Hemetmesis	1	1.7%

TABLE 6: ADMISSION TO DEATH INTERVAL

Time	No of Deaths	Percentage
Within 24 hours	14	24.1 %
25 -48 hours	12	20.6 %
49-72hours	3	5.3%
>72 hours	29	50%

From **Table 6** it was observed that max deaths reported was after 72 hours of admission and was@ 50%, minimum death in 48-72 hours only 5%.It is important to observe that if patients survived for 48 hours and vitals are reversing back they can be prognosticated well but if they crossed 72 hours they worsened drastically.

TABLE 7: DELIVERY OUTCOMES

Babies	No of cases	Percentage
Live births	44	75.9%
Intrauterine death	5	8.6%
Still births	9	15.5%
Mode of Deliveries		
Spontaneous vaginal deliveries	40	69%
Caesarian section	18	31%
Associated operations		
Obstetric Hysterectomy	7	12%
With bilateral	4	7%

internal iliac artery ligation		
Without internal iliac artery ligation	3	5.2%
Subtotal hysterectomy	3	5.2%
Total hysterectomy	4	7%
Thoracotomy	1	1.7%
Temporal craniotomy	1	1.7%
Tracheostomy	1	1.7%
Exploratory laparotomy	1	1.7%

Major factors responsible for deaths were PPH, PET, DIC, Sepsis, Eclampsia accounting for 31%, 24%, 21%, 20% respectively. Almost 14% patients landed with Acute Kidney Injury causing ultimate death .Severe anaemia accounted for 12% death. Some were associated or contributory factors as is seen in Table 5. Uterine rupture was noted in 4 cases (7% death).

In our study we noticed that outcome of delivery was good as 75.9% women had live births and mode of delivery being spontaneous vaginal delivery in70% while 30% underwent caesarian section. During span of these 10 years in this group of maternal deaths7 women (12%) underwent obstetric hysterectomy with or without bilateral internal iliac artery ligation, few associated surgeries were also performed to deal with the complications like thoracotomy, craniotomy, tracheostomy etc, as is seen in **Table 7.**

DISCUSSION: After analyzing maternal deaths in our Department of OBG, Goa Medical College, Goa over a span of 10 years a decade (Jan 2004 to Dec 2013) we can say as for as maternal mortality is concerned it has been found to be considerably low even inspite of being only teaching and government hospital, and only referral centre for the state of Goa and border areas of neighbouring states. It is on an average 106 per 100000 live birth which is approximately 50 % less in comparison to maternal mortality ratio in India (MMR-212 /100000 live birth) as is seen in **Table 1**. One of the tertiary care study has shown MMR 73.17 in 2000 to 164 in 2009 [7]. Other studies from tertiary care institutions reported MMR of 371-4286 per 100,000 live births [8].

In our study most deaths were observed in 20 to 30 years age group but primis were more affected as is seen in Table 2&3, which was similar to other studies [9]. Hemorrhage was common cause of death and is comparable with most of other studies [10].

Thus, large variation in maternal mortality was seen in different part of the countries and from our hospital. The reason could be that our hospital (Dept. of OBG, GMC) is used for large no of admissions and deliveries thus bringing down maternal mortality ratio whereas in hospitals from UP, Bihar, Orissa etc, where most of the deliveries take place at home and even illegal abortions are carried out, women generally seek hospital care in emergency attributing to higher mortality. Deaths were more in referral groups as is seen in **Table 4**. Admission to death interval showed that maximum deaths were noted after 72 hours of admission as is seen in **Table 6**. Delivery outcome was good and also some lifesaving operations were as is seen in **Table 7.** This was also indicated by the fact that proportion of deaths duo to direct causes was more, other factors could be general awareness, antenatal care, women status, poverty and female literacy are important social risks factors and along with women`s status closely interlinked with maternal death. It was interesting to note that the major causes of maternal deaths were mixed picture of what present in developing and developed countries.

We found PPH, PET, DIC, Sepsis, Anaemia and Hepatitis were major causes as in developing countries but also noticed Embolism, Cardio myopathy, Psychiatric illness, congenital heart disease being causes of death as in developed countries as is seen in Table 5 . According to Health Information India,1990, despite legalization of abortion, facilities for abortion are far from satisfactory with @ 10% referral deaths being duo to abortion but we in our series didn`t see single death duo to abortion related death or even history of interference duo to septic abortion.

Maternal death is an avoidable tragedy and can be prevented by making emergency obstetric care an easy access to women even in the most remote area of India. Emergency obstetric care is one of the

recent strategies promoted by WHO for the reduction of maternal mortality and morbidity in developing countries[14].Although more pregnant women are accessing the health services, lack of adequately trained and motivated personnel at these sites probably resulted in the unfortunate women being picked up and referred late to a tertiary center[15]. Proper antenatal care, emergency obstetric care and routine audits for maternal mortalities are needed to decrease the maternal mortality as well as to evaluate the trends of maternal deaths and that will help to develop subsequent policies protocols to tackle life threatening obstetric emergencies [16]. The classical triad of causes of maternal mortality in our study remained heamorrhage, eclampsia and sepsis as in other studies [6]. Acording to W H O report (2005) ‘’make every women and child count” heamorrhage is the leading cause of maternal death[17].

The risk of pregnancy is present in every society and in every setting. In countries where MMR is very low these risks have been largely overcome because every pregnant woman has access to proper antenatal and intra natal care. Such is not the case in many developing countries where each pregnancy taken as rebirth for woman itself, as many women never returns from the `journey of pregnancy’. The risks that women face in bringing life into the world are not mere misfortunes or unavoidable natural disadvantages but injustices that society must remedy through its political health and legal system.

CONCLUSION: To conclude, though institutional delivery is safer, it is not possible in all cases and therefore, we need to ensure that all women have access to high quality essential and emergency obstetric services along with provision for effective contraceptive and safe abortion services to reduce mortalities due to unplanned pregnancies. Essential standards need to be set. For all these, intensive efforts need to be directed at policy, programme, training and research activity. So we will be able to reduce these preventable tragedies of loosing mothers and ultimately we reach `Zero’ maternal death, although target is < 100 /100000live birth by year 2015(National Socio demographic Goal For 2015). As in any medical illness `Prevention is better than cure’, it is true in maternal death also. Best way of prevention is screening by educating a woman. Also, a recent systemic review of the causes of death stressed the need for increased emphasis on prevention and treatment of obstetric hemorrhage and noted that most post-partum deaths should be avoidable by appropriate management [11].

``Educate a man and you educate an individual. Educate a woman, and you will educate a family’’.
- Mahatma Gandhi

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REFERANCES:

1. Govt. of India (2011), Annual Report to the People on Health, 2011, Ministry of Health and Family Welfare, New Delhi.
2. WHO (2005), Regional Health Forum, Vol.9, No.1, 2005.
3. WHO, UNICEF, World Bank (2012), Trends in Maternal Mortality: 1990-2010.
4. National Rural Health Mission: Framework for Implementation 2005-2012. New Delhi: Ministry of Health and Family Welfare, Govt. of India.
5. WHO/UNICEF/UNFPA Maternal Mortality in 2005 estimate developed by WHO, UNICEF, UNFPA and the World Bank, Geneva WHO:2007
6. AICOG Committee Opinion. Number 283, May 2003, New US. Food and Drug administration labeling on cytotec (misoprostol) use and pregnancy. Obstet Gynecol. @003:101:1049-50.
7. Konar et al. Maternal Mortality: A FOGSI Study(based on institutional data). J ObstetGynecol India. 2013; 63(2):88-95.
8. Bedi and Kambo et al. ICMR TASK Force Study. J ObstetGynecol India. 2001; 51:86-92.
9. Ashok.V.Santosh M. A Study on Maternal Mortality. J ObstetGynecol India. 2008; 58:229-9.
10. Bates I. Chapotera G et al, McKew S, et al. Maternal Mortality in sub-Sahara Africa: the contribution of ineffective blood transfusion services. BJOG. 2008; 115:1331-9.
11. Khan KS, Wojdyla D, Say l, et al. WHO analysis of causes of maternal death: a systematic review. Lancet. 2006:367:1066-74.
12. Dikid et al, Maternal and perinatal death inquiry and response project implementation review in India. J. of Obs. And Gynecol of India. 2013; 63(2):101-107.
13. Khumanthem et al. Maternal mortality and its causes in a tertiearycentre. J. of Obs. And Gynecol of India. 2012;62(2)168-171
14. Singh et al. Obstetric Emegencies: Role of Obstetric Drills for a Better Maternal Outcome. J. of Obs. And Gynecol of India. 2012; 62(3):291-296.
15. Guin et al. Trends in Maternal Mortality and Impact of Janani Suraksha Yojana on Maternal Mortality ratio in a tertiary referral hospital. J. of Obs. And Gynecol of India. 2012;62(3):307-311

16. Pathak Dinesh et al. changing Trends of Maternal Mortality: A comparative Study. J. of Obs. And Gynecol of India. 2011: pg. 161-165.

17. Puri et al. Maternal Mortality in an Urban Tertiary Care Hospital of North India. J. of Obs. And Gynecol of India. 2011: pg. 280-285.

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