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A STUDY OF MATERNAL MORTALITY IN A TERTIARY HEALTH CARE CENTRE IN WEST BENGAL

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ABSTRACT: BACKGROUND: An observation study was conducted at the Gynaecological and Obstetric Department ,Medical College and Hospital, Kolkata, of maternal deaths from 1st July 2009 to 30thJune 2010. **AIMS**: To analyze from data of maternal mortality how variables like sociodemographic factors, incidents surrounding maternal mortality, causes of it and time of death to admission interval affect maternal mortality. **DESIGN:** Observational secondary data based study **MATERIALS AND METHODS**: Maternal deaths between 1st July 2009 to 30th June 2010 were studied at the department of Gynaecology and Obstetrics, Medical College and Hospital, Kolkata. Data regarding detailed case history, routine antenatal investigations, time of detection of deteriorating patient status with treatment instituted along with referral card, if any, was collected. Data was collected and analysed using MS Excel and Stat cal. **RESULTS**: 48 maternal deaths were studied. Maternal deaths were notably more among rural ladies. Deaths were more due to direct causes and more among vaginal deliveries than instrumental deliveries and caesarean sections. Maximum number of deaths was within 24 hours of admission. **CONCLUSION**: Early registration, immunization, regular antenatal visits, trained birth attendants along with institutional deliveries, prompt referral and timely interventions go a long way in bringing down maternal mortality in a developing country like India.
KEYWORDS: Maternal deaths, MMR, causes, distribution

BACKGROUND: Maternal death is one of the leading causes of death for women of reproductive age in many parts of the world especially in the developing countries with majority of deaths occurring in Asia and Africa. In spite of the growing concern about reproductive health, information on levels, trends and differentials in maternal mortality remains fragmentary in most developing countries. In developing countries maternal mortality rate remains still very high.[1]

In India maternal mortality is very high and the rates tend to be lower in urban areas which reflect easier access of the city dwellers to medical services. To achieve MDG 5 and reduce the maternal mortality ratio by three-quarters before 2015 [2], improving health care for women and providing universal access to reproductive health services must be prioritized. This includes access to family planning, prevention of unplanned pregnancies and provision of high-quality pregnancy and delivery care, including emergency obstetric care.

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With this in view a study was done with the objective to analyze some pertinent variables surrounding maternal mortality in a tertiary level care hospital during a period of one year.It is a retrospective data based study where variables considered were sociodemographic parameters (as available from records), medical incidents surrounding mortality and time of morbidity with eventual mortality.

MATERIALS AND METHODS: The study was conducted in Department of Obstetrics and Gynaecology, Eden Hospital, Medical College, Kolkata a tertiary level care hospital from available records. All the maternal deaths occuring within one year (1st July 2009 to 30th June 2010) were reviewed, however the accidental and incidental cases of maternal mortality were excluded. Traditionally 42 days following delivery is the time duration taken in consideration when maternal mortality is discussed, however information for such a long period are not available from a hospital records. Hence the maximum longevity prior to death (in women admitted with pregnancy and its complication in the labour ward) in this study was found to be 7 days , which was categorised as within 24 hours and between 24hours- 7 days and analyzed. Also the time elapsed following admission to mortality was seen and categorised as within 24 hours or early, 24hours- 7 days as intermediate and late as beyond 7 days. Records were reviewed and considered; pertinent variables were collected in a structured proforma. The results were analysed in MS excel and statcal software was used for significance testing.

RESULT AND ANALYSIS: In the present there were 14952 live births and 48 maternal deaths from the study period 1st July 2009 - 30th June 2010. Out of 48 maternal deaths 5 cases (10%) where of <20 years of age and 43 cases (90%) where of >20 years. Here booked cases were taken as those mothers who had atleast 3 - antenatal visits are it in the same hospital or other, public, private or govt. setup Table 2 shows 26(54.2%) cases were unbooked and 22 cases (45.8%) were booked. Deaths were more among unbooked cases (p= 0.82). Only 8 cases i.e. (17%) belonged to urban areas whereas 83% were from rural areas, thus deaths were significantly more among mothers residing in rural areas(p= 0.00). Of the 48 maternal deaths 60% i.e. 29 cases were referred from peripheral health centres, district hospital, and private hospitals. Remaining 40% i.e. 19 cases were directly admitted to the hospital. Mortality was more among multiparous women as compared to primiparous though not significantly (52%/48%, p=0.8)

Table 3 shows that in cases where any form of operative ventures were done (EmLSCS 29%, Laparotomy 4%) mortality was less. It was more than vaginal delivery where mortality was 38 % (p=0.76). Mortality was also seen in 4% of abortion and in 25% undelivered cases. Thirty cases (67%) had a direct cause for their death like, hypertensive disorders of pregnancy (44%), hemorrhage (13%), unsafe abortion causing sepsis (6%), amniotic fluid embolism (28%) and uterine rupture (6%). Sixteen cases (33%) had indirect problems as their cause of death like, anemia (44 %), hepatitis (25 %), malaria (1 %). heart disease (19 %). 2 cases had one or more direct and indirect cause involved. In 35% cases death was prior to delivery whereas it was significantly more in the post delivery period (p=0.006) of 65%.

Table 3 also shows that deaths were more in institutional deliveries (61%vs10%)(p= 0.007)probably indicating a bias as the study is institution based and data reflected ,missed out on home delivery data

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Table4 .shows that 69% cases died within 24 hours of admission and 29% within 24 hours to 7 days of admission Two percent died after 7 days of admission

DISCUSSION: A maternal death is the outcome of chain of events and disadvantages throughout a women's life. According to the Tenth revision of International Classification of Diseases (ICD-10) by WHO, 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 the site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes.[3,4]

The cause of maternal death are multiple and these causes can be according to ICD -9 AND ICD-10 divided into, direct or indirect causes .Direct maternal deaths are those resulting from complications of the pregnant state (pregnancy, labour and Puerperium), from interventions, omissions, incorrect treatment, or from a chain of events arising from any of the above. Indirect maternal deaths are those due to previously existing disease or disease that develop during pregnancy, direct obstetric causes but which was aggravated by the physiological effects of pregnancy.[5] Maternal mortality rate (MMR), the most commonly used indicator of maternal death measures a woman's chances of dying from a given pregnancy, which is determined by total number of maternal deaths per hundred thousand live birth in a particular defined place in a defined time of one calendar year.

This study was done in order to analyze in detail about the factors responsible for maternal deaths. During the study period, there were 14952 live births and 48 maternal deaths. Thus maternal mortality in our hospital was 321 per 1,00,000 live births

Maternal mortality in the present study was high as against the national average reported by SRS 2004-2006 of 254 for India on a whole and 141 in West Bengal. This discrepancy can be explained by the fact that a higher concentration of maternal deaths is a resultant of a higher concentration of live birth as expected in a tertiary level care hospital. Furthermore due to referral from all parts of the state there is a load of exclusively high risk patients each with its own share of raised mortality risks.

In India maternal mortality is more in the unbooked case as compared to booked cases. In the present study a similar reflection was seen as deaths were more amongst unbooked cases. Shanthi Roy (1998) reported it to be 89%.Pal Amitava, Ray Prasanta, Hazra Sami*r*, Mondal *T* 87-91[6,7,8,9] ,Dilpreet kaur & Vaneet kaur (96.3%)[15.]

Booking ensures a minimum checkup and necessary precautionary methods to anticipate high risk cases demanding special attention. It has been proved here beyond doubt that the benefits of booking and subsequent antenatal care are enormous.

In the present study 80% of maternal death occurred in age group 21-30yrs . Similar findings were seen (age bracket of below 30 years) by Shanthi Roy (1998) as 73% and Sengupta (1983) 61% Reena J wani(2004) 65.8% ,Rashmi Singh (2009) 56.54% [6,8,10,11].

In the present study maternal mortality in multigravida was 52%, in primigravida 48%.A similar observation of more mortality among multigravida was seen by Madhu Jain & Shilajee Maharahaje who reported in mortality among multigravida 36% and that among primigravida as 26% with deaths among grand multigravida as 36%[15] Shanthi Roy in their study found mortality among multigravida as40% while that among primi as37% and deaths in grand multigravida as 23%.

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[8]. Apparently as number of gravida increases there is reluctance towards seeking as also delivering care which is reflected in almost all the studies showing an increased percentage of deaths among multigravida. This calls for perhaps a more rigorous scrutiny of cases presenting as multigravida instead of a lackadiscal approach on account of the expected ease of delivery.

In the present study 40 cases (83%) were from rural areas i.e. significantly more than urban residing area. Observation by Pal Amitava was 61.66% residing in rural area [11] and that of Dilpreet kaur & Vaneet kaur was 98%[15]. Considering the fact that about 70% of Indian population resides in rural area, and reflection from these findings are poor health care services in rural area, perhaps programmes like NRHM require more boost up.

In the present study the maternal deaths were more in referred cases (60%, p=0.07). Findings in seen in study by Shantha seetharam showed death among referral to be 72%[8]and 68% by Dilpreet kaur & Vaneet kaur[15] Perhaps these factors are taken in account when national programmes like NRHM, emphasize so much on well equipped first referral unit(with facility for 24 hours operation ,anaesthetist and blood transfusion facility).

 In the present study it was seen that 69% of the deaths occurred within 24 hrs of admission, 29% within 24 hrs -7 days and 2% after 7 days. Figures for the same in study by Shanthi Roy were 62%, 30% and 8 % respectively[12]. Rashmi Singh found 58.36% maternal death to be within 24 hrs - 7 days. [14]

In the present study 65% of mothers died in post delivery (i.e post natal) period, 25% died without having delivered, this in comparison with Shantha seetharam et al 78%, and 21% [13]. Dilpreet kaur & Vaneet kaur, (62.3% and 37.7%) [15] salient points from all these findings were mortality is highest within first 24 hours. The present day emphasis on emergency obstetric care, wherein it has been recognised that skillful management in the peri delivery period can go a long way in decreasing maternal mortality.

Among all the maternal mortality cases 38% delivered spontaneously, about 33% required operative procedures (LSCS, laparotomy), and nearly 25% undelivered (includes post abortal).Similar percentages was seen by Shanthi Roy where 32.8% mortality were in mothers having spontaneous deliveries, 22.7% operative deliveries, and 25.9% post-abortal[12]. Both these data are suggestive of the fact that while attention is often focused on operative cases a significantly large percent of apparently normal delivery cases develop complication enough to warrant death. Hence all delivery cases necessitate vigilance. Presently safer abortion methods are provided under RCH programme to address the unmet needs of family planning programme perhaps due to reflection from data like high mortality among abortion cases.

In the present study direct cause of maternal deaths accounted for 63% of maternal deaths and indirect cause 33% whereas in 4% both direct and indirect causes were involved. Here eclampsia constituted majority of the deaths (26%) among direct causes. These are similar findings by to Pal Amitava [5] 46% and Rashmi Singh[14] 24%. Other causes are pulmonary embolism 19% and PPH 8%. In the present study haemorrhage was the 3rd leading cause of death, which mirrors the global scenario as reported by WHO in 2005.[6] The Indian scenario reported by Rehana Kausar[14] haemorrhage is the most common cause of death accounting for 25% of the deaths. Amongst the indirect cause anemia accounted for majority of the deaths i.e in 44% of cases. Eclampsia is preventable by routine blood pressuring checking as also anaemia. Keeping this in mind again the

time tested value of routine antenatal care can certainly be useful in avoiding the catastrophe of maternal mortality.

Time of death surrounding delivery and admission reflects mortality to be highest within the first 24 hours both of admission. Again present day emphasis on emergency obstetric care mirrors the fact managing the peri delivery incidents efficiently can actually reduce the greatest bulk of maternal mortality.

CONCLUSION: From the above study it can be said that surrounding a maternal mortality there are modifiable and unmodifiable factors. However some unmodifiable factors are amenable to modification which can possibly alter the picture of unforced errors towards maternal deaths. For instance although rural residence cannot be altered, health care facility at the rural level can be upgraded, likewise referral cannot be avoided but effective first referral unit can be instituted. Early registration along with regular checkups is to be emphasized.

Even though childbirth is considered a normal physiological process a watchful vigilance during pregnancy or booking can not only strain out the pathological cases from the physiological cases but also provide essential medical care to avert death from direct causes like hypertension and indirect causes like anemia.

Proposed initiatives of the health sector like 100% institutional deliveries, emphasis on emergency obstetrics care further reduce the number of deaths surrounding the delivery time which forms the bulk of maternal deaths.

Statistics regarding maternal mortality are improving but the unfortunate mother who succumbs to this statistics is a hundred percent dead. Our target is thus not only to improve the statistics but to realize that no women should die while giving birth.

TABLE 1: Showing age wise distribution

Age	no	percent
15-20yrs	5	10%
21-25 yrs	18	38%
26-30 yrs	20	42%
31-35yrs	5	10%

Maximum mothers were in the age group of 26-30.

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TABLE 2: Showing relevant sociodemographic variables of causes of mortality

Residence	
Rural	83.3%
Urban	16.7%
Sig : z=6.3, p=0.00(sig)	
Booking status (regular visit)	
Booked	22%
unbooked	26%
Sig: z=0.22,p=0.82	
Referral status	
Referred	60%
Not referred	40%
Sig : z=1.76, p=0.07	
Parity	
Primi parous 48%	
Multiparous 52%	
Sig z=0.19,p=0.8	

TABLE 3: Showing distribution of maternal deaths according to incidents surrounding mortality

Mode of delivery		
Vaginal	38%	Z=0.3,p=0.76
Instrumental	33%	
Abortion	4%	
Undelivered	25%	
Place of delivery		
Institutional#	61%	Z=5.01,p=0.00(sig)
Home	10%	
undelivered	14%	
Time of death with respect to delivery		
Prior to delivery **	35%	Z=2.74,p=0.006(sig)
Following delivery	65%	
Cause of death		
Direct	63%	
Indirect	33%	
both	04%	

referred or direct admission to place of study

** involves antenatal, abortion, undelivered cases.

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TABLE 4: Showing distribution of time related variables of of death

Time of death following admission		
Within 24 hours	33	69%
24 hours- 7 days	14	29%
More than7days	1	2%

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