Why Do Mothers Die?

HANIF S.
Department of Obstetrics and Gynaecology, Fatima Memorial Hospital College of Medicine and Dentistry, Lahore
Correspondence: *Dr. Shamayela Hanif, Assistant Professor* ***E-mail:*** *shamayela1@yahoo.com*

Objective: To identify the main causes and associated risk factors contributing to maternal deaths.

Study Design: Analysis of retrospective data.

Place and Duration of Study: Department of Obstetrics and Gynecology, Fatima Memorial Hospital from January 2001 to December 2005.

Method: The medical records of the women dying were reviewed. Demographic record including age, parity, socioeconomic status and antenatal care were analyzed from patient's records.

Results: Seventeen maternal deaths were recorded during the study period with the maternal mortality ratio MMR of 58.53/100,000 live births (17/29042). The causes of death in all 17 cases were made on clinical assessment done jointly by Gynaecologist, Anaesthetist and Physician as post-mortem examination was not done. The major causative factor for maternal death was hypertensive disorder 6 (35.29%) followed by coagulation disorder due to intrauterine death 2 (11.76%), amniotic fluid embolism 2 (11.76%) and fatty liver of pregnancy 2 (11.76%). Causes like thromboembolism, haemorrhage, anaesthetic complications and puerperal myocarditis were responsible for a single death each. No cause could be ascertained in one case. The age of the women who died ranged between 21-39 years. There were 7 primigravidas (41.17%), 7 (41.17%) were Para 1-4 (41.17%) and 3(17.64) women had parity more than 4. Most of them had poor socioeconomic status. Only 4 women were booked (23.52%). The rest 13 women (76.47%) were unbooked.

Conclusion: Most of the causes of maternal deaths are preventable if timely identified and treated by skilled health care professionals.

Key Words: Maternal Mortality, Haemorrhage, Eclampsia

According to the **WHO**, "A 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 the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes."[1] Every woman can experience sudden and unexpected complications during pregnancy, childbirth and just after delivery. Although high quality and accessible health care has made maternal death a rare event in developed countries, these complications can often be fatal in developing world. [1] There are over 500,000 maternal deaths each year due to complications of pregnancy and child birth which amounts to one woman dying every minute of every day.[3] Most of the deaths occur in Asia but the risk of dying is highest in Africa. Women in countries with high fertility and high maternal mortality run the highest life time risks of deaths. It is as high as 1 in 16 in sub-Saharan Africa and 1 in 65 in Asia as compared to Europe with1 in 2000. In North-America it is as low as 1 in 3500[3].

UNICEF estimation of MMR in Pakistan is 340 per 100,000 live births with major cause of maternal mortality being haemorrhage followed by hypertensive disorders, infections and unsafe abortions[6].

Pregnancy is a natural phenomenon which if associated with complications can lead to maternal mortality. In Pakistan socio-cultural milieu safeguarding a pregnant woman's health is not given the importance which is due. In order to chalk out a plan of action to reduce maternal mortality figures, one has to understand the size of the problem empirically. Most of the causes of maternal death can be corrected using simple common sensical solutions. It is towards finding the preventable causes that this study was carried out.

Material and methods

The study was done in the Department of Obstetrics and Gynaecology at Fatima Memorial Hospital, Lahore. It is an analysis of retrospective data. Records of deliveries conducted during the last five years (2001-2005) were studied. Demographic record including age, parity, socio-economic status and ante-natal care were analyzed. The socioeconomic status was divided into four categories according to monthly income {poor class i.e. less than Rupees (Rs.) 3000 per month, lower middle class i.e. Rs. 3000-10,000, upper middle class i.e. Rs. 10,000-20,000 and high class i.e more than Rs.20,000}. Probable cause of death was made on clinical assessment done by Gynaecologist, Anesthetist and Physician as postmortem examinations was not done.

Results

The numbers of deliveries carried out from January 2001 to December 2005 were 29042. During this time period there were 17 maternal deaths and thus maternal mortality ratio calculated was 58.53/100,000. All 17 deaths were classified as Direct (death being directly related to pregnancy).

Hypertensive disorders during pregnancy turned out to be the major cause of maternal mortality. Amniotic fluid embolisms, fatty liver of pregnancy and coagulation disorder secondary to intrauterine demise were the second commonest causes (Table 1).

The ages of the women dying ranged between 21-39 years. Out of 17 dead women, 12 had a age range between 21-30 years (70.58%), 4 were between 31-35 years (23.52%) and only 1 was more than 35 years of age (5.88%).

Table 1: *Causes of maternal mortality.*

Causes	= n	% age
Hypertensive disorder	06	35.29
Coagulation disorder due to intrauterine death	02	11.76
Amniotic fluid embolism	02	11.76
Fatty liver of pregnancy	02	11.76
Thromboembolism	01	5.88
Haemorrhage	01	5.88
Anaesthetic complications	01	
Puerperal myocarditis	01	5.88
Unknown	01	5.88

Majority of the women belonged to poor socioeconomic class with 9 maternal deaths (52.94%). Four women belonged to lower middle class (23.52%), three to upper middle class (17.64%) and only one had a high socioeconomic status (5.88%). Seven women who died were primigravidas (41.17%), another seven had parity range 1-4 (41.17) and the rest of the three had parity> 4 (17.64%).

Table 2: *Age specific maternal mortality ratio.*

Age	No. of deliveries	No. of maternal deaths	Age specific MMR/100,00
<20	1994	0	0
20-30	20424	12	58.75
31-35	5611	04	71.28
>35	1057	01	94.60

Table 3: *Parity specific maternal mortality ratio.*

Parity	No. of deliveries	No. of maternal deaths	Age specific MMR / 100,00
Primigravida	5948	07	117
P1-4	22080	07	31.7
>P	1014	03	295.8

Four out of 17 maternal deaths (23.52%) had regular antenatal check-up whereas the rest of the 13 cases (76.47%) were unbooked.

Maternal mortality ratio was observed to be directly proportional to age (Table 2). High order multipara had a higher MMR followed by primigravidas (Table 3).

Analysis of socio-economic status revealed that poverty was an important contributory factor in increasing maternal mortality ratio many folds (Table 4).

Maternal mortality ratio drastically falls with regular antenatal check ups as shown in Table 5.

Table 4: *Socioeconomic status specific maternal mortality ratio*

Socioeconomic status	No. of deliveries	No. of maternal deaths	MMR (Per 100,000)
High	7534	1	13.27
Upper-middle	12016	3	24.96
Lower-middle	6476	4	61.76
Low	3016	9	298.40

Table 5: *Antenatal care specific maternal mortality ratio.*

Status	No. of deliveries	No. of maternal deaths	MMR (Per 100,000)
Booked	22759	4	17.57
Unbooked	6283	13	206

Discussion

Pregnancy is a natural phenomenon and the morbidity and mortality associated with pregnancy is preventable.[5] Yet more than half a million women die from complications of pregnancy and childbirth in a year. Less than 1 percent of these deaths occur in developed countries demonstrating that they could be avoided if resources and services are available[7].

In many developing countries, complications of pregnancy and child birth are the leading causes of death among women of reproductive age. High maternal mortality ratio in many countries is the result of inadequate reproductive health care of women and inadequately spaced births[3]. Women die because they have no access to skilled personnel during pregnancy and parturition and when an emergency arises they cannot reach a facility where emergency obstetrical services are available.[8] Maternal mortality ratio of the World is estimated to be 400/100,000 with MMR of Africa to be as high as 850/100,000 followed by Asia 330/100,000 and it is significantly low in Europe being 24/100,000[9]. The country with highest estimated number of maternal deaths is India (136,000), followed by Nigeria (37,000) and Pakistan (26,000).[9] Further, it is well recognized that maternal mortality numbers are often significantly underreported[18].

In our study, MMR is 58.53 per 100,000 which is lower than a local study at Jinnah Hospital where MMR turned out to be 240 per 100,000. [15] While comparing MMR at different regions of Pakistan, it was observed that MMR at Abbotabad[10], NWFP, was the highest (1270/100,000) followed by Quetta[11], Balochistan (650/100,000) and Karachi[12], Sindh (304/100,000). UNICEF estimation of MMR of Pakistan is 340/100,000[6].

In our study, hypertensive disorders were the main causative factor of maternal deaths (35.29%). These deaths are almost always preventable if hypertension is detected earlier and treated by regular antenatal care. On the contrary, haemorrhage followed by pre-eclampsia/eclampsia were the main causes of death observed in most of the studies carried out in Pakistan.[10,11,15,17] Limited availability of blood for transfusion is an important factor leading to deaths due to haemorrhage in countries with high maternal mortality ratios.

While comparing with international studies, there is a wide variation of MMR and causative factors among developed and developing countries. According to Confidential Enquiries into maternal deaths in UK 2000, the MMR is 11.4/100,000 with thromboembolism being the major direct cause followed by hypertensive disorders and sepsis[14]. In a survey done in United States, the MMR calculated was 12.6/100,000.[2] MMR in India is close to that of Pakistan being 259/100,000 with hypertension and haemorrhage as the main causes.[20,13] Severe preeclampsia/eclampsia was the commonest cause of death among patients in Nigeria.[13] Causes of maternal death worldwide is haemorrhage 25%, hypertension 25%, infections 15%, unsafe abortions 15% and indirect causes 20%.[4,21] The contribution of anaesthesia to maternal mortality in the developed countries is 1.7 per million pregnancies mainly due to difficult or failed intubation[19].

Maternal mortality ratio increases drastically with increasing age, parity and lack of antenatal care as found out in our study. The MMR among unbooked patients in a hospital at Nigeria was extremely high (23,121.4 per 100,000) as compared to booked patients (339.7 per 100,000).[13] It is seen that the percentage of women who seek antenatal care is extremely low. Each year 60 million women give birth with the help of untrained traditional birth attendant. The distance from health services, cost of transportation and drugs, multiple demands on women's time and lack of decision making power within the family are the major hindrances in seeking essential health services by our women and thus as few as 5% of women receive such care in poor countries and regions[8].

Conclusion

The government and the medical community place a very high emphasis on safe motherhood. However, MMR is alarmingly high as compared to the developed countries. It is still possible that MMR may be higher in rural settings than the estimates in this study. This situation can be rectified only by the efforts of the Health Authorities, the Medical Professionals and the Government acting in concert with one another.

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