MATERNAL MORTALITY IN A TERTIARY CARE HOSPITAL,
LAHORE - A Four Year Review

SHAHEEN KAUSAR, SHAZIA KHALID, FARAH YOUSAF AND MAMOON AKBAR
Department of Obstetrics & Gynaecology Unit I, Jinnah Hospital, Lahore - Pakistan

This study was carried out to determine the cause and frequency of maternal deaths in Jinnah Hospital, Lahore which is a tertiary care hospital. The study was performed between January 2000 and December 2003 at Gynae unit-I. The case notes of all patients who died during January 2000 to December 2003 period in Jinnah Hospital gynecological unit-I as a result of conditions associated with pregnancy, labor, and puerperium (6 weeks after pregnancy) were reviewed in an effort to identify the most common cause of maternal deaths. Final conclusion regarding the causes of death were drawn after consultation within the department as well as with the concerned department like Medical, Surgical, Anaesthesia and ICU. Total number of deaths recorded during this period was 46. Maternal mortality ratio, measuring the risk of deaths specifically during pregnancy, was calculated to be 289.58/100,000 live births. Direct obstetrical deaths were 43 (93.47%) and there were three indirect deaths. Obstetrical haemorrhage accounted for 14 cases (30.43%). Septicaemia was second most common (11 cases, 23.91%). Eclampsia accounted for 7 cases (15.21%). Maternal mortality rate has been improved in 2002 (198.91/100,000) as compared to 333.55/100,000 in 2000 but again there was rise in 2003 (308.64/100,000).

INTRODUCTION

The maternal mortality ratio (MMR) is a measure of the risk of death once a woman has become pregnant. It is measured as number of deaths of women from pregnancy related causes, when pregnant or within 42 days of termination of pregnancy per 100,000 births. During the 1990s, a number of international conferences set goals for a reduction of maternal mortality. In 1999, during appraisal of the Cairo Programme of Action, a reduction in maternal mortality was reiterated to be a high priority and countries agreed to strengthen information systems further to permit regular monitoring of maternal mortality.

Childbirth is of course a part of human survival and should be an event for the mother to celebrate. Pregnancy and childbirth are regarded as normal physiological events in a woman’s life and most women as well as their families don’t consider it essential for them to receive any antenatal care. It is not a disease as pregnancy related morbidity and mortality is preventable.

Maternal mortality ratio is a global indicator of status of women in a country. The intensity and the magnitude of the problem can be realized by the fact that 136 million women bear children annually. The WHO estimates that there are over half a million maternal deaths every year in the world. Ninety-nine percent of these belong to the developing world. Less than one percent of these deaths occur in developed countries, demonstrating that they could be avoided if resources and services were available.

In addition to maternal death, women experience more than 50 million maternal health problems annually. As many as 300 million women (more than one quarter of all adult women living in the developing world) currently suffer from short- or long term illness and injuries related to pregnancy and childbirth. Every minute of each day 380 women get pregnant and 190 of these are unplanned pregnancies; 110 women experience pregnancy related complications; 40 women face an unsafe abortion and at least one woman dies due to complicated child births. Maternal mortality ratio (MMR) of Pakistan has been calculated by UNICEF (1997) as 340/100,000 live births, whereas national health survey put the figure as 500/100,000 LB (1998). According to Dew Hursts MMR in Pakistan is 905/100,000 LB, which is maximum in the world. Maternal mortality ratio in Balochistan was calculated to be 560/100,000 LB. Maternal mortality is a complex factor, which is influenced by the women’s social and economic status, age, and parity, by her nutritional status in childhood and adulthood. It is also an indicator of her access to antenatal care and delivery services and the quality of these.
systems. Multiple pregnancies increase the risk of maternal deaths\textsuperscript{13}. Monitoring mortality rate is one of the most basic ways of checking the effectiveness of a clinical service. In developing countries maternal and perinatal mortality rates are the main indicators of the quality of maternity services and they demand constant vigilance even in developed countries. This study was carried out to evaluate and establish the causes of maternal deaths in Jinnah Hospital, Lahore. Having a sound knowledge in this respect and understanding of maternal care is an important step towards designing and implementing interventions for positive behavior changes. This study is a step in this direction.

**PATIENTS AND METHODS**

The study was conducted at Gynecology unit-I Jinnah Hospital, Lahore, which is affiliated with Allama Iqbal Medical College, Lahore. This is a tertiary care hospital situated in southern Lahore nearest to motorway and a wide catchment area of several districts of Punjab. The case notes of all patients who died during January 2000 to December 2003 period, as a result of conditions associated with pregnancy, labour, and puerperium (6 weeks after pregnancy) were reviewed in an effort to identify the most common causes of maternal deaths. The information recorded included name, age, time of admission, condition and diagnosis at admission, investigations done, treatment given and final diagnosis. The cases were discussed within the department and as well opinion was taken from medical, surgical, and anaesthesia personnel, before the final diagnosis was made. Postpartum autopsy seldom was possible; consequently, the cause of death was based on clinical findings only. When the cause of death could be attributed to more than one factors, the most likely factor was assigned the cause of death. Frequency, ratio and proportions of different causes of maternal mortality were calculated.

**Inclusion Criteria**

All parturient admitted for delivery to gyne Unit that died during the course of pregnancy, labor or puerperium. Pregnant mothers referred from another hospital or from home, when an emergency developed, whether they were admitted to the Medicine, Surgery and the Obstetrics and Gynecology departments at the hospital.

**Exclusion Criteria**

Excluded were patients who were dead on arrival, those mothers with preexisting medical conditions of such a severity in which pregnancy is contraindicated.

**RESULTS**

Total maternities during study period were 15885. Total deaths recorded were 46. Maternal mortality during this period was 289.58. It was observed that maternal mortality in year 2000 was 333.55, in year 2001 was 381.55, in year 2002 was 198.91 and in year 2003 was 308.64. So there was a marked improvement in maternal mortality in year 2002 although cases managed were almost double, that is 5596 in 2002 as compared to 3029 in 2000. However, there was an increase in maternal mortality in 2003; which might be due to increased prevalence of hepatitis during pregnancy.

**Table 1: A four-year overview.**

<table>
<thead>
<tr>
<th></th>
<th>Maternities</th>
<th>Deaths</th>
<th>Maternal Mortality Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>2998</td>
<td>10</td>
<td>333.55</td>
</tr>
<tr>
<td>2001</td>
<td>3145</td>
<td>12</td>
<td>381.55</td>
</tr>
<tr>
<td>2002</td>
<td>5530</td>
<td>11</td>
<td>198.91</td>
</tr>
<tr>
<td>2003</td>
<td>4212</td>
<td>13</td>
<td>308.64</td>
</tr>
<tr>
<td>Total</td>
<td>15885</td>
<td>46</td>
<td>289.58</td>
</tr>
</tbody>
</table>

Ratio per 100,000 maternities

The leading causes of maternal death during the period of 4 years included obstetrical haemorrhage in 14 (30.43%), septicaemia in 11 (23.91%), eclampsia in 7 (15.21%), ruptured uterus in 3 (6.52%), anaesthetic complications in 3 (6.52%), anaphylactic reactions 3 (6.52%), pulmonary embolism in 2 (4.34%), myocardial infarction in 1 (2.17%) and hepatic encephalopathy in 2 (4.34%).

Obstetrical haemorrhage was the most frequent direct obstetric cause of mortality, although there is some reduction in mortality due to haemorrhage in 2002(2 cases) as compared to 2000 (4 cases) thus indicating better management. There were 5 cases of haemorrhage in 2003 all these cases were referred late.

Second most common cause was septicaemia. Deaths due to septicaemia were 4 in 2000, 2 in 2001, 2 in 2002 and 3 in 2003, thus indicating need for improvement in the management. Third most common cause was eclampsia 7 cases, 1 in 2000, 2 in 2001, 3 cases in 2002 and 1 in 2003. Indicating improvement in its management. The fourth most common cause was deaths due to ruptured uterus, 3 cases. One in 2000, two in 2001 and there was no deaths due to ruptured uterus in 2002 and in 2003, indicating better management in this respect as well. The other important cause of maternal death was anaesthetic complication
Table 2: Causes of maternal deaths.

<table>
<thead>
<tr>
<th>Direct Causes of Maternal deaths</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>Total died</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haemorrhage</td>
<td>03</td>
<td>04</td>
<td>02</td>
<td>05</td>
<td>14</td>
<td>30.43</td>
</tr>
<tr>
<td>- PPH</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>03</td>
<td>08</td>
<td>17.39</td>
</tr>
<tr>
<td>- APH</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>02</td>
<td>04</td>
<td>8.69</td>
</tr>
<tr>
<td>- DIC</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>02</td>
<td>4.34</td>
</tr>
<tr>
<td>Septicaemia</td>
<td>04</td>
<td>02</td>
<td>02</td>
<td>03</td>
<td>11</td>
<td>23.91</td>
</tr>
<tr>
<td>Eclampsia</td>
<td>01</td>
<td>02</td>
<td>03</td>
<td>01</td>
<td>07</td>
<td>15.21</td>
</tr>
<tr>
<td>Ruptured uterus</td>
<td>01</td>
<td>02</td>
<td>0</td>
<td>0</td>
<td>03</td>
<td>06.52</td>
</tr>
<tr>
<td>Anaesthetic complications</td>
<td>0</td>
<td>0</td>
<td>03</td>
<td>0</td>
<td>03</td>
<td>06.52</td>
</tr>
<tr>
<td>Anaphylactic reactions</td>
<td>0</td>
<td>02</td>
<td>0</td>
<td>01</td>
<td>03</td>
<td>06.52</td>
</tr>
<tr>
<td>Pulmonary embolism</td>
<td>01</td>
<td>0</td>
<td>0</td>
<td>01</td>
<td>02</td>
<td>04.34</td>
</tr>
<tr>
<td>Indirect Causes of Maternal deaths</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Myocardial infarction</td>
<td>0</td>
<td>0</td>
<td>01</td>
<td>0</td>
<td>01</td>
<td>02.17</td>
</tr>
<tr>
<td>Hepatic encephalopathy</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>02</td>
<td>02</td>
<td>04.34</td>
</tr>
<tr>
<td>Total cases each years</td>
<td>10</td>
<td>12</td>
<td>11</td>
<td>13</td>
<td>46</td>
<td>100.00</td>
</tr>
</tbody>
</table>

(3 cases). All 3 cases were in year 2002 due to deficiency of experienced staff in anaesthesia department. Two patients (4.34%) died due to hepatic encephalopathy in 2003.

DISCUSSION

Maternal mortality is an index of socio-economic status of a country and the perinatal mortality rate of standards of obstetric and perinatal services available there. Collection of obstetrics biostatistics is essential for planning health services. It allows obstetricians to compare their work with that of others. It also helps to find the specific field where the progress might be made or failure has occurred. The practice of developed countries to carry out a confidential enquiry in all cases of maternal deaths by the Maternal Deaths Review Committee at different levels is not followed. From such enquiries it has become apparent that there are avoidable factors in many cases of maternal deaths and by proper attention to these factors and their rectification, hence maternal deaths can be prevented.

Today, both maternal and perinatal deaths are so rare in the developed world that standards of obstetric care cannot be assessed in terms of mortality rate14, where the lifetime risk of a woman dying during childbirth as 1 in 2,800, while in developing countries it was 1 in 61. For Africa as a whole, the lifetime risk was 1 in 2015. Maternal deaths are all the more tragic because they can be prevented in simple and cost-effective ways. Infections, blood loss, and unsafe abortion account for the majority of deaths; all these causes are well within the abilities of health workers with midwifery skills to tackle. The management of these problems and surgical procedures, such as caesarean delivery, do not require high technology equipment or expensive drugs. What is lacking is not the level of national wealth, but the level of commitment to do something. Conscious decisions are required; China, Cuba, Iran, Malaysia and Sri Lanka have all been able to achieve and maintain significant reductions in levels of maternal mortality by deliberately allocating the resources where they were needed16. Reducing the number of women dying in childbirth by 75% by 2015 is one of the United Nations Millennium Development Goals17. These goals cannot be achieved without the renewed and full commitment of governments, local communities, civil society, the private sector and the international community.

Maternal deaths is defined by WHO as, death of a women while pregnant or/and within 42 days of termination of pregnancy) the origin of 42 days is no longer clear). Reporting mortality only up to 42 days after termination of pregnancy underestimates the level of maternal mortality and should be revised to include mortality up to 3 months, thus reflecting the true burden of pregnancy related problems for poor women in developing countries18.

Our study shows not only reduction in over all maternal mortality but also reduction in number of deaths due to obstetrical haemorrhage, septi-
caemia and ruptured uterus, suggesting an improvement in the quality of maternal health services as compared to the past. Studies of routinely collected data about maternal deaths and more recently, perinatal deaths have certainly being informative and may well have contributed to a reduction in the incidence of these disasters.

Maternal mortality rate in our country can be reduced by decreasing birth rate, preventing complications, early identification and treatment of complications, effective and accessible antenatal care, to promote safe delivery practices, to create awareness for the detection of situations that would require medical intervention and to have an access to appropriate emergency obstetric care. Decisions-makers at political, economic, social, religious and household levels (which tend to be dominated by men) have to realize that pregnancy and childbirth can and should be made safer, all that the very fabric of their societies depends on it.

CONCLUSIONS

Though maternal mortality figures from hospital-based studies are usually over-estimates of the true picture in the community they tend to provide a more thorough assessment of the underlying causes of death and their contributing factors, hence providing useful data for planning interventions in areas like:

- Pre-pregnancy care: Awareness of its importance, general health care, nutrition and folic acid supplementation, immunization and contraception.
- Antenatal care: Awareness of its importance, diet, iron and calcium supplements, immunization and recognition of danger signs.
- Intrapartum care: Training of TBAs, hygiene. Recognize danger signs and avoid delay in seeking care and referral.
- Postpartum care: Exclusive breast-feeding, maintain hygiene, immunization and recognition of danger signs in both mother and newborn.

REFERENCES