Maternal Mortality in Ramathibodi Hospital : A 28-Year Comparative Study

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Abstract

A comparative review of maternal mortality rates at Ramathibodi Hospital from 1969 through 1996 including 176,161 live births is presented. The data are divided into two time periods, both of 14 years, for comparison. A significant decrease in direct obstetric deaths secondary to infection and toxemia ($P < 0.05$). The rate of deaths due to indirect causes in unchanged. Deaths due to malignancies have increased.

This study of maternal mortality demonstrates the need for increased contraceptive services, voluntary sterilization, patient education and preconceptional identification of high-risk patients for further reduction of the maternal mortality rate.

Key word : Maternal Mortality, Direct Obstetric Deaths, Indirect Obstetric Deaths, Ramathibodi Hospital

Maternal mortality in Thailand has decreased 10 fold over the last 30 years[1]. Factors which have contributed to this improvement include research into pregnancy and its complications, increased prenatal care, increased hospital deliveries, ready availability of blood transfusion, and the widespread use of antibiotics.

The goal of every obstetrician is to approach the irreducible minimum number of maternal mortalities. A periodic review of causes of death and changing trends is desirable in order to evaluate this progress. In 1985, Phuapradit et al reviewed all maternal mortalities at Ramathibodi Hospital from, January 1, 1969, through December 31, 1982, a 14 - year period[2]. The purpose of this study is to review the maternal mortality at Ramathibodi Hospital from January 1,1983, through December 31, 1996, a 14 - year period and to compare it with the previous study.

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MATERIAL AND METHOD

Between 1969 and 1996 a total of 45 cases of maternal death were registered in the Department of Obstetrics and Gynecology, Ramathibodi Hospital. Detailed information of all dead cases was recorded in the departmental maternal death conference and clinico-pathological conferences. Autopsies were carried out in 62 per cent of the cases. During the same period, there were 176,161 live births.

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 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. Maternal deaths are classified as direct, indirect and non-related obstetric deaths. Direct obstetric deaths include 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 include those resulting from previous existing disease or disease that developed during pregnancy and which was not due to direct obstetric causes, but which was aggravated by physiologic effects of pregnancy. The rate is computed per 100,000 live births[3].

RESULTS

Table 1 shows the maternal mortality rate in the Obstetric unit of Ramathibodi Hospital from 1969-1996. The maternal mortality for all causes was 25/100,000 live births.

Table 2 shows a comparison of the number of live births, maternal deaths, maternal mortality rates and autopsy rates between the two time periods under study. In the previous study, 1969-1982, there were 72,872 live births and 26 maternal deaths with a maternal mortality rate of 35.7/

Table 1. Maternal mortality, Ramathibodi Hospital 1969-1996.

Year	Live births	Deaths	Rate per 100,000 live births
1969	596	1	170
1970	2386	-	-
1971	3711	4	110
1972	4499	-	-
1973	4690	-	-
1974	5613	2	40
1975	6133	5	80
1976	6310	3	50
1977	6486	2	30
1978	6496	1	20
1979	6317	3	50
1980	6532	3	50
1981	6469	1	20
1982	6634	1	20
1983	6726	-	-
1984	6538	-	-
1985	6600	-	-
1986	7375	-	-
1987	7112	-	-
1988	7510	3	40
1989	7560	4	53
1990	7825	-	-
1991	7716	3	39
1992	7889	1	12
1993	7935	2	25
1994	7451	3	40
1995	7593	-	-
1996	7459	3	40
Total	176161	45	25

100,000 live births. The autopsy rate was 77 per cent. In this study, there were 103,289 live births and 19 maternal deaths with a maternal mortality rate of 18.4/100,000 live births. The autopsy rate was 42 per cent.

Direct obstetric deaths

Table 3 shows that between 1969 and 1982, 20 deaths were due to direct obstetric causes, for a rate of 27.4/100,000 live births. During the 1983 to 1996 period, 8 deaths were attributed to direct obstetric causes with a decrease in the rate to 7.7/100,000 live births and a statistical significance ($P < 0.05$). There was also a sizeable reduction in the deaths from toxemia and infection. However, an increase was noted among hemorrhage and anesthesia.

Indirect obstetric deaths

Table 4 shows the comparison of indirect causes for the years 1969-1982 and 1983-1996. In the previous study, indirect causes accounted for 6 cases with a rate of 8.2/100,000 live births com-

Table 2. Comparison of number of live births, maternal deaths, maternal mortality rates and autopsy rates.

	Number of live births	Number of maternal deaths	maternal deaths rate*	Autopsy rate (%)
1969-1982	72872	26	35.7	77
1983-1996	103289	19	18.4	42

* Deaths per 100,000 live births

Table 3. Direct obstetric deaths, by cause of death, 1969-1982 and 1983-1996.

Cause of death	1969-1982		1983-1996	
	No of deaths	Rate/100,000	No of deaths	Rate/100,000
Hemorrhage	1	1.4	3	2.9
Toxemia	3	4.1	0	0
Infection	13	17.8	0	0
Amniotic fluid embolism	3	4.1	3	2.9
Anesthesia	0	0	2	1.9
Total	20	27.4	8	7.7*

* $P < 0.05$

Table 4. Indirect obstetric deaths, by cause of death, 1969-1982 and 1983-1996.

Cause of death	1969-1982		1983-1996	
	No of deaths	Rate/100,000	No of deaths	Rate/100,000
Cardiac disease	1	1.4	4	3.9
SLE	2	2.7	0	0
Viral hepatitis	3	4.1	0	0
Vascular disease	0	0	2	1.9
Total	6	8.2	6	5.8*

SLE = Systemic lupus erythematosus
* $P > 0.05$

Table 5. Maternal mortality per 100,000 live births by cause.

	1969-1982		1983-1996		
	No	Rate	No	Rate	P
Direct causes	20	27.4	8	7.7	0.001
Indirect causes	6	8.2	6	5.8	0.57
Non-related causes	0	0	5	4.8	-
All causes	26	35.7	19	18.4	0.03

pared to this study with 6 cases and a rate of 5.8/100,000 live births. The difference was not significant ($P > 0.05$).

In this study, four maternal deaths were classified as due to cardiac disease. Three of these were associated with rheumatic heart disease and one with peripartum cardiomyopathy. Antopsy was not done in all four cases cerebral. Two ruptured arteriovenous malformations were included in the vascular disease category. Both cases had to autopsy.

Non-related obstetric deaths

In the previous study, there was none to report, but in this study, five patients died from malignancies, one case each from metastatic adenocarcinoma of the rectum, breast cancer, leukemia and two cases from brain tumor.

DISCUSSION

The purpose of this study of maternal mortality was to focus on present and past problems and how to prevent them, if possible, from recurring in the future.

Table 5 shows a comparison of maternal mortality by causes from the two different time periods under study. A marked reduction in direct obstetric deaths is demonstrated by a decrease from 27.4/100,000 live births to 7.7/100,000 live births ($P < 0.05$). This reduction was primarily due to a decrease in deaths due to toxemia and infection. In toxemia, there were 393 cases of severe pre-eclampsia and eclampsia in 1969-1982 compared with 789 cases in 1983-1996, and yet there was no maternal death in the later half. This is due to better patients' education, antenatal care, and labor intensitive care management including the liberal use of cesarean section. Toward the end of the first period, the switch from valium to magnesium sulphate therapy for treating toxaemic patients improved the maternal outcome tremendously. Infection from criminal and septic abortion which was the leading cause of death in the previous study, showed a remarkable decrease in deaths in this study. This is due to a reduction of criminal abortion, better education, and improvement of aseptic abortion techniques together with the increased use if antibioties. Hemorrhage was the leading cause of death in this study. Of these three maternal deaths, all were considered preventable, two from ruptured tubal ectopic pregnancies and one from uterine atony. The death from uterine atony was unfortunate in that the recognition of the cause was delayed, thus, the delay in proper management. This should not have happened in a tertiary center. Although improved diagnostic techniques (transvaginal ultrasound, discriminatory serum ßHCG assays[4]) have decreased overall morbidity and mortality associated with ectopic pregnancy, these deaths attest that continued clinical vigilance and a high degree of suspicion are necessary for prompt management. Amniotic fluid embolism showed a constant cause of death in both periods. The frequency of amniotic fluid embolism reflected a need for more research into the early diagnosis and treatment of this entity. The pathophysiology of this disease is not fully understood. There were two anesthesia deaths from adverse drug reaction and one unrecognised high spinal block.

Indirect causes were essentially unchanged. However, the major indirect cause of death was three rheumatic heart diseases with one heart valve replacement. Since the medical treatment for such patients has improved more will become pregnant. This suggested the need for more careful screening of patients with cardiovascular disease and the need to routinely offer contraception to such patients. In this study, peripartum cardiomyopathy also accounted for one cause of death. This condition is nearly always unforeseen and thus not preventable. Cardiac transplantation is a more recent therapeutic

option for such patients, with recent estimates showing that 11-17 per cent of patients with peripartum cardiomyopathy eventually receive cardiac transplants[5]. Although open-heart surgery during pregnancy has been performed, exposure to cardiopulmonary bypass may have serious consequences for the fetus[6]. In short, such patients should not be allowed to continue pregnancy. There was no maternal death in systemic lupus erythematosus in the latter period. This was due to better medical management and early resort to termination of pregnancy before the disease became unmanagable. The improved medical management in viral hepatitis reflected in no maternal death in the second half. The two deaths from vascular disease during antepartum were due to arterio-venous malformation.

Although the previous study and some reviews[7-9] have chosen not to include non-related cause in their results, we have included five deaths in this study because the impact of maternal death on a family is devastating despite the cause. All of the causes of death in this study were due to malignancies and death occurred in the antepartum period.

The overall mortality rates for these two time periods showed a decrease of approximately 50 per cent, the quality of obstetric care has improved and is reflected by the significant decrease in direct obstetric deaths. Further reductions in all categories might be achieved through preconceptional identification of high risk patients. Such a program would require the well co-ordinated efforts of patients, educators, nurses, physicians and the community.

(Received for publication on October 28, 1998)

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การตายของมารดาทางสูติกรรมในโรงพยาบาลรามาธิบดี การศึกษาเปรียบเทียบใน 28 ปี

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ได้รายงานการศึกษาเปรียบเทียบการตายของมารดาทางสูติกรรมในโรงพยาบาลรามาธิบดี ตั้งแต่ปี พ.ศ. 2512 ถึง พ.ศ. 2539 ซึ่งมีจำนวนทารกเกิดมีชีวิตทั้งหมด 176,161 ราย การศึกษาเปรียบเทียบใน 2 ช่วงระยะเวลา 14 ปี พบว่าสาเหตุการตายโดยตรงลดลงจากสาเหตุจากการติดเชื้อและภาวะครรภ์เป็นพิษอย่างมีนัยสำคัญทางสถิติ ($P < 0.05$) สาเหตุการตายโดยอ้อมไม่เปลี่ยนแปลง พบว่าสาเหตุการตายจากโรคมะเร็งได้เพิ่มขึ้น

จากการศึกษาการตายของมารดาทางสูติกรรมนี้ แสดงให้เห็นถึงความจำเป็นในการเพิ่มการให้บริการการคุมกำเนิดทั้งชั่วคราวและถาวร การให้ความรู้ด้านสุขศึกษาแก่มารดาตลอดจนการคัดกรองตรวจหามารดาที่มีความเสี่ยงสูงก่อนการตั้งครรภ์ เพื่อลดอัตราการตายของมารดาทางสูติกรรมต่อไป

คำสำคัญ : การตายของมารดา, การตายของมารดาโดยตรงทางสูติศาสตร์, การตายของมารดาโดยอ้อมทางสูติศาสตร์, โรงพยาบาลรามาธิบดี

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