

Maternal Mortality Rates at Hacettepe University Hospital/Turkey

Tülay BOZKURT, Özgür ÖZYÜNCÜ, Ali AYHAN

Department of Obstetrics and Gynecology, Faculty of Medicine, Hacettepe University, Ankara, Turkey

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Abstract

Objective: The aim of this study is to review the causes of maternal mortality and show trends in years at Hacettepe University Hospital in Turkey.

Materials and Methods: This study retrospectively analyses 128 maternal deaths between 1968 and 2004.

Results: During this period, the maternal mortality rate was 143.4/100 000 live births. The most common direct, indirect and non-maternal causes of maternal mortality were infection, cardiac diseases and neoplasms respectively. The maternal mortality rate declined from 417/100 000 live birth between 1968 and 1972 to 50/100 000 live birth between 1998 and 2003.

Discussion: When precautions are taken to some problems that may lead to maternal mortality maternal mortality rates are lowered.

Keywords: maternal mortality, direct causes, indirect causes, non-maternal deaths

Özet

Hacettepe Üniversitesi Hastanesi'nde Maternal Mortalite Oranları

Amaç: Bu çalışmanın amacı Hacettepe Üniversitesi Hastanesi'nde yıllar içerisinde maternal mortalite nedenlerinin ve hızlarının incelenmesidir.

Materyal ve Metot: Bu çalışma retrospektif olarak 1968-2004 yılları arasında olan maternal ölümleri incelemektedir.

Sonuç: Bu süre içerisinde maternal mortalite oranı 143.4/100 000 canlı doğum olarak hesaplanmıştır. En sık olarak gözlenen maternal mortalitenin direkt, dolaylı ve maternal olmayan nedenleri sırasıyla enfeksiyon, kardiyak hastalıklar ve neoplazilerdir. Maternal mortalite 1968-1972 yılları arasında 417/100 000 canlı doğumdan 1998-2002 arasında 50/100 000 canlı doğuma düşmüştür.

Tartışma: Sık görülen maternal mortalite nedenleri için gerekli önlemler alınırsa, bu durum maternal mortalite oranlarını azaltacaktır.

Anahtar sözcükler: maternal mortalite, direkt nedenler, dolaylı nedenler, maternal olmayan nedenler

Introduction

Maternal mortality is an important health problem all over the world. A maternal death, as defined by the ninth and tenth revisions of the International Statistical Classification of Diseases and Related Health Problems (ICD), is "the death of a woman while pregnant or within 42 days of the end of the 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" (1).

Maternal deaths can be further classified into direct and indirect obstetric causes (1,2). Direct maternal deaths are those resulting from conditions or complications, or their management, which are unique to pregnancy and occur during the antenatal, intrapartum or postpartum period. Five major causes of direct obstetric deaths are hemorrhage (usually postpartum), sepsis, eclampsia, obstructed labor and unsafe abortion. Indirect maternal deaths are those resulting from the previously existing disease or that developing during pregnancy and not due to direct obstetric causes, but which is aggravated by physiological effects of pregnancy. Examples of indirect deaths include epilepsy, diabetes, cardiac disease and hormone-dependent malignancies. The United Kingdom Confidential Enquiry into Maternal Deaths (UKCEMD) also classifies most deaths from suicide as indirect deaths, as they were usually due to puerperal mental illness, although this is not recognized in the ICD coding of such deaths.

Corresponding Author: Dr. Özgür Özyüncü

Hacettepe Üniversitesi Tıp Fakültesi

Kadın Hastalıkları ve Doğum AD

Sıhhiye, Ankara, Türkiye

Phone : +90 312 305 18 01

Fax : +90 312 311 63 72

E-mail : ozgurozy@hacettepe.edu.tr

We know that nearly 530 000 maternal deaths fit this definition every year all over the world (3). Maternal and infant mortality rates are basic indicators that reflect a nation's health status. Maternal mortality ratios are reported to be less than 10 per 100 000 live births in developed countries, while 41 of 47 African countries have maternal mortality rate of greater than 350/100 000 (4). In Turkey, the latest survey conducted in hospitals in the selected 53 provinces and this hospital-based survey revealed that maternal mortalities make up 5% of all deaths in women and maternal mortality is 49.2 per 100 000 live births (5). This number has been achieved throughout years. In our institute, the maternal mortality rate declined from 417.7 deaths per 100 000 live births between 1968-1972 to 73.7 deaths per 100 000 live births between 1988-1992 (6). In this study we aimed to review the causes of maternal mortality and highlight trends between the years 1968 to 2004 in Hacettepe University Hospital in Turkey.

Materials and Methods

This study retrospectively analyses the causes of 128 maternal deaths that took place in Hacettepe University Hospital between 1968 and 2004. Information about these patients were collected from patients' files and hospital records and death certificates.

Maternal deaths were defined as deaths that occurred during pregnancy or within 42 days of the end of a pregnancy, and for which the cause was listed as a complication of pregnancy, childbirth or the puerperium (1). Maternal mortality ratios were calculated as the proportion of the

maternal deaths to the total number of observed live births during the study period. The site or the duration of pregnancy had no importance in this definition. Deaths resulting from direct obstetric complications of pregnancy, labor or the postpartum period were accepted as direct obstetric deaths. A death, that is caused by diseases that the patient previously had or diseases that arose during pregnancy and became worse by the effects of pregnancy were accepted as indirect obstetric deaths. Suicide is accepted as an indirect cause of death if the reason is a postpartum mental illness. Other causes of death were grouped in non-maternal causes of death.

Results

During the period between 1968-2004, there were a total of 81.731 live births. In the same period there were 128 maternal deaths (Table 1). 71.1% (97/128) were due to direct and 14.06% (18/128) were due to indirect maternal deaths. There were 13 deaths (10.16%) due to non-maternal causes. Therefore the maternal mortality rate was 143.4/100 000 (115/80 207) live births.

The mean age of patients were 30.48 (range 16-44). Of the 128 maternal deaths 8 patients (6.25%) were under 20 years and 37 (28.90%) patients were at or over 35 years old. The mean parity of patients was 3.40. While 16.40% (21) of the maternal deaths were primigravida, 21.90% of patients (28) were in women with 4 or more gravidas.

In our series, the most common causes of maternal mortality were infection (55.47%) and cardiac diseases (10.15%). The

Table 1. Causes of maternal mortality

	Years							Total (%)
	1968-1972	1973-1977	1978-1982	1983-1987	1988-1992	1993-1997	1998-2004	
Direct								
Hemorrhage	2	3	1	2	1	-	-	9 (7.03)
HDP*	2	1	2	2	1	-	1	9 (7.03)
Infection	17	25	22	5	1	1	-	71 (55.47)
Anesthesia	1	-	-	-	-	-	-	1 (0.78)
Embolism	-	-	2	3	2	-	-	7 (5.47)
Indirect								
Cardiac	1	2	2	2	3	-	3	13 (10.15)
CVA**	-	1	-	-	2	1	-	4 (3.12)
Suicide	-	-	-	-	-	-	1	1 (0.78)
Nonmaternal								
Blood disease	-	3	1	-	-	-	-	4 (3.12)
Neoplasm	-	1	-	1	2	1	2	7 (5.47)
Tuberculosis	-	-	1	-	-	-	-	1 (0.78)
Trauma	-	-	-	-	-	-	1	1 (0.78)
Total	23	36	31	15	12	3	8	128 (100)
Live Births	5507	9435	15581	17281	12281	10230	9892	80207

**HDP: hypertensive diseases of pregnancy
*CVA: cerebrovascular accident

other leading causes of maternal mortality were hemorrhage and hypertensive diseases of pregnancy, mainly eclampsia. Only one woman was lost due to anesthesia complications in direct causes of maternal mortality. Infection related deaths were either due to septic abortion in 73.23% of patients or puerperal sepsis in 26.70%.

In the direct causes of maternal mortality the most common three causes were infection, hemorrhage and hypertensive diseases of pregnancy with 55.47%, 7.03% and 7.03% incidence respectively. As seen in Figure 1, the rates of these causes decreased greatly.

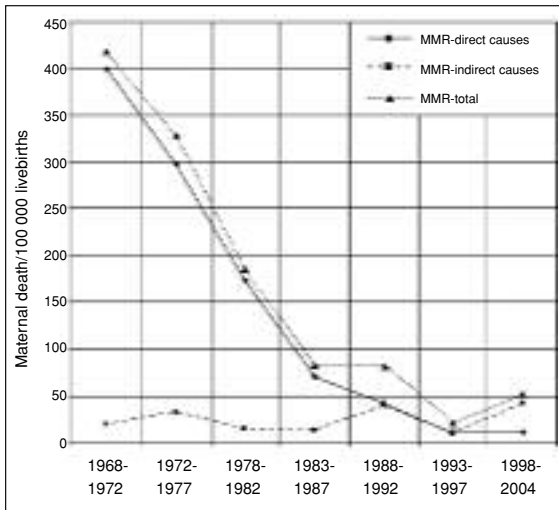


Figure 1. Maternal mortality rates throughout years with respect to causes

In indirect causes of maternal mortality, the most common cause were deaths due to cardiac diseases (10.15%). As in total maternal mortality rates in years, the death rate from cardiac diseases remains relatively constant.

Neoplasms (5.47%) were the most common cause of maternal mortality in years in group of non maternal causes.

When the maternal mortality rates were analysed in 5-year periods, the maternal mortality rate declined from 417/100 000 live birth in 1968-1972 to 50/100 000 live birth in 1998-2003. Direct maternal mortality rates also dropped from 399/100 000 live birth to 10/100 000 live births from 1968-1972 to 1998-2004 respectively (Figure 1). As expected the maternal deaths due to indirect reasons did not increase in years.

When maternal deaths are analysed for maternal age, most of the deaths were observed after the age of 35. In the encountered maternal deaths, 30.50% of them are in women >34 years of age. Whereas only 6.30% of deaths were observed under 20 years of age.

Discussion

On the basis of the present exercise, the estimated number of maternal deaths in 2000 worldwide was 529 000. In terms of the maternal mortality ratio, the world figure is estimated to be 400 per 100 000 live births. By region, the maternal mortality ratio was highest in Africa (830), followed by Asia (330), Oceania (240), Latin America and the Caribbean (190), and the developed countries (20) (7).

For countries lacking complete vital registration or other acceptable national estimate of maternal mortality, the estimates are developed using a model. Using this model the WHO estimated the maternal mortality ratio to be 70/100 000 live births in Turkey (7). But there are some hospital based studies demonstrating conflicting maternal mortality rates. For example a retrospective clinical analysis of 117 maternal deaths between 1968 and 1992 showed that the overall maternal mortality ratio was 180/100 000 (108/59 993) in Hacettepe University Hospital (6). But in another retrospective study performed during 1983-1992 in Turkey, 17 maternal deaths occurred out of 100 531 live births giving a maternal mortality ratio of 16.90/100 000 live births (8). The reason for this may be that the death rates in a reference center may be overestimated. Therefore, estimations of maternal mortality rates should rely on national registries. But hospital based surveys may provide some information about the causes of deaths throughout the years.

There are a few studies performed at different hospitals of Turkey at different time intervals to determine the maternal mortality ratio and the common causes (5,6,8-10). Most of these studies show that majority of the deaths were due to direct obstetric causes; most commonly the hypertensive diseases of pregnancy, infection and hemorrhage. Most of the studies concluded that direct obstetric deaths, which are largely preventable with proper antenatal care and

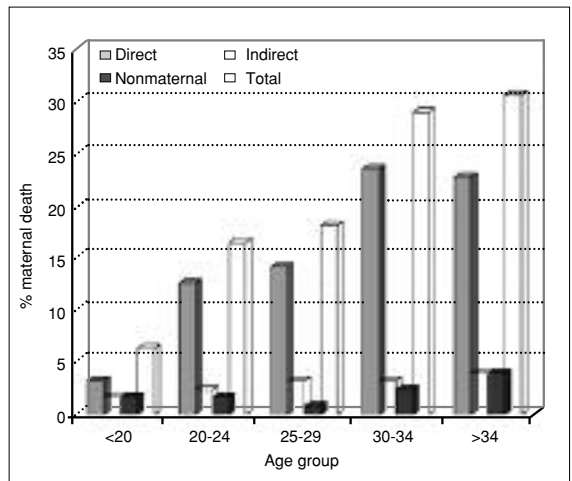


Figure 2. Maternal mortality rates in age groups and causes

health services, are still a serious problem for our country. As expected, with adequate antenatal care complications of pregnancy may be diagnosed earlier and be treated. Furthermore with adequate antenatal care, precautions may be taken against some common problems which may lead to maternal mortality and, therefore, may reflect on maternal mortality rates.

As it can be observed in Table 1, maternal deaths related to infection decreased around the year 1983. Most of the maternal deaths before that time were mainly due to septic abortion. But after 1983, the number of maternal deaths due to septic abortion decreased abruptly. This is a very good example of how legal arrangements of governments may change the maternal mortality ratios. In 1983, on maternal demand, medical or surgical abortion after the tenth week of gestation became illegal in Turkey. Additionally, development of new wide spectrum antibiotics and their use made a great contribution to this decline.

In our study, it may be clearly seen that throughout the years the deaths due to direct maternal reasons have decreased. Direct obstetric deaths which consist of mostly preventable causes are very rare in our hospital which is a good indicator of the health care at this institution.

Our hospital is a tertiary health center; therefore, we no longer see these preventable causes. Instead, complicated pregnancies with unpreventable causes and maternal deaths due to indirect or non maternal causes are on the rise. Further decrease in these groups of causes will take place by preventing unplanned pregnancies. This will only be possible with use of family planning methods.

In conclusion, the maternal mortality ratio in our hospital showed a declining trend throughout the years and the ratio is getting closer to that of the developed countries. Further reduction of this ratio is possible if pregnancy and childbirth is made even safer by taking other preventive measures and also by the use of effective contraceptive methods. We have to spread those efforts to reduce maternal mortality all over the country. The aim should be to ensure the access of all pregnant women to skilled attendance at the time of delivery and to the necessary care for obstetric complications when they arise.

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