

Maternal mortality in a teaching hospital in Sudan

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ABSTRACT

Objectives: Although there is a great advances in obstetrics in recent years, a hard core of maternal mortality still lingers and is considered to be an irreducible minimum. Nevertheless there has been worldwide decline in maternal mortality over the past decades. Yet maternal mortality is still the major public health problem throughout the world.

Methods: A retrospective study carried out at the Medani Teaching Hospital, Medani City, Sudan. Case notes were reviewed for all the 877 women died during the period 1985-1999. All parturients were followed for at least 6 weeks after delivery so that deaths due to sequel of delivery and puerperium were also included. The data was analyzed and the literature was reviewed to compare the results of similar studies.

Results: Out of the total number of deliveries in that period (N = 44,605), 877 women died with a rate of 1,966 per

100,000. This rate showed a decline each year, being 2,661 per 100,000 during the period 1985-1989. The mortality rate during 1990-1994 was 2,021 per 100,000 and 1,363 per 100,000 during the last period of 1995-1999. Sepsis was the cause of death in almost one third of cases, while malaria accounted for 37.2%. The number of preventable deaths had decreased steadily.

Conclusion: The study highlighted the existence of a serious and preventable obstetrical problem. Sepsis, malaria hemorrhage and hypertensive disorders are the main contributory factors. Poor antenatal care, poor intranatal care, and poor provision of health services add more to the problem. Research into the problem of malaria, sterilization, anesthesia, vascular accidents, and indication for cesarean section together with social and medical improvements will definitely reduce the maternal morbidity and mortality.

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Although there has been a worldwide decline in maternal mortality over the past decades due to improved health services it is still the major public health problem throughout the world. In this study, the death report and the death certificate are used and both need a good system of recording the deaths and births in order to achieve an accurate estimation of maternal mortality rate. The study needs a lot of work since it compares the total hospital births with the total hospital deaths. In spite of great strides in obstetrics, maternal mortality has not been completely eliminated. The study aimed to review the maternal mortality rate and its main

causes. It also attempts to draw broad lines for the prevention of maternal deaths.

Methods. The study was carried out at the Medani Teaching Hospital, Medani City, Sudan. Case notes were reviewed for all maternal deaths occurring during the period 1985-1999, relevant data related to age, parity, and cause of death was collected. Maternal mortality in this study is defined as deaths attributed to pregnancy childbirth and the puerperium. The period was divided into 3 periods of 5 years 1985-1989, 1990-

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1994, and 1995-1999. The literature was reviewed to compare the results of similar studies.

Results. Eight hundred and seventy-seven women died during the period 1985-1999. The total number of deliveries in this period was 44,605 with an overall rate of 1,966 per 100,000. During the period 1985-1989 the mean number of deliveries was 2,713 per year and 316 women died during this period with a rate of 2,661 per 100,000. During 1990-1994 the mean number of deliveries was 2,819 per year, 285 women died during this period with a rate of 2,001 per 100,000. During 1995-1999 the mean number of deliveries was 3,380 per year, 231 women died with a rate of 1,363 per 100,000. A total of 27,182 deliveries were unbooked (62.3%) while the remaining 16,793 were booked (37.7%). Twenty-eight thousand five hundred and twenty came from rural area (63.9%) while the remaining 16,085 came from urban area 36.1%. **Table 1** shows the incidence of maternal mortality per 100,000 in each year for the 3 periods. It shows that the number of deaths is declining each year. **Table 2** shows the distribution of deaths according to the age and parity. It is clear that the mean age of the parturients who died was 33.1 years with a range of 22-46 years. Of the 877 patients who died, 306 (34.9%) were primigravida, 271 (30.9%) were Para II and Para IV, and the remaining 300 (34.2%) were grandmultipara. **Table 3** shows the causes of deaths. The causes of deaths were classified in relation to pregnancy and delivery as direct and indirect causes. **Table 3** shows that the 479 cases (54.6%) were due to direct causes while 498 (45.4%) were due to indirect causes. Considering direct causes of death, sepsis was the leading cause during the 3 periods with a mean of 27.3%, the number of death decrease with time. Malaria on the other side was the main indirect cause of death contributing to mean of 37.2%.

Discussion. Much of the bias inherited in maternal mortality based on hospital data stem from the fact that the nominator and dominator represent a different population. Wad Medani Teaching Hospital is in the Gezira State. Gezira State is a well-developed states in Sudan, where there is a trained midwives, and most of the women contenting difficulty in delivery are transferred to the hospital. Hence, death in the hospital is a fair representative of the number of deaths in the community, but not all childbirths take place in the hospital so that the dominator is not an accurate representative of the community as large. The maternal mortality was comparable to the world,¹ under developed countries² and Sudan.³ It is well above the rate of developed countries. These rates are definitely high enough to emphasize the magnitude of the problem at the Wad Medani Teaching Hospital; it furnished a good justification for medical authorities to take serious measures to reduce it. Infection as a cause of death has not been totally eliminated inspite of widespread use of

antibiotics including new and very potent ones. The emergence of bacteria resistant to antimicrobial agents is a possible explanation. It is clear that deliveries by cesarean section (CS) are strong risk factors. Infection looms large as a direct cause of maternal death in most reports.^{4,5} In this material there was steady decreases in the incidence of infection during the 3 period. Hypertensive disorder of pregnancy (eclampsia) was the second cause of death (mean 8.5%). Results in Asia and Latin America show similar results,^{6,7} but almost all the deaths presented to the hospital were established eclampsia. Few of them had vaginal delivery others had CS or hysterectomy. All of them died in the postoperative period. The number of patients who were admitted as eclampsia and survived was not known but definitely were not few. Patients with eclampsia died of cerebral hemorrhage, renal failure, pulmonary edema, hepatic failure, and disseminated intravascular coagulation. In later years, this entity became rare, owing to the improvement of the antenatal care and early intervention in high-risk cases and the intensive care given to severely affected patients. Hemorrhage accounted for a mean of 4.3%, compared to the United Kingdom (UK)⁸ and Kingdom of Saudi Arabia (KSA), it was high. All deaths due to hemorrhage were due to primary postpartum hemorrhage (PPH) and not a single case died of antepartum hemorrhage. Deaths due to hemorrhage decrease in the last 2 periods and this is explained by proper early intervention and the availability and safety of blood transfusion. Complications of miscarriage contributed to a mean of 5.1% compared to KSA and UK, it was very high. The majority of cases died of postabortal septicemia but none died of bleeding. Rupture of uterus contributed to a mean of 2.9% when compared to Egypt⁹ Fujjian¹⁰ it was very low. Women have died of different causes related to rupture of uterus including hemorrhage, amniotic embolism and infection. Fortunately the number of ruptured cases of the uterus is now declining due to proper antenatal care and improved care of delivery.

In this study, pulmonary embolism accounted for a mean of 1.6 compared to KSA and UK⁸ it was low. Although pulmonary embolism is rare, it is very serious and dramatic. At the present time, little can be carried out to prevent them, but some strides have been made for earlier and more accurate diagnosis and early treatment. Anesthesia contributed to a mean of 2.3%, 10 cases developed intraoperative cardiac arrest, 6 cases were due to wrong intubations and 4 cases the operation was to be blamed for the death in one way or another. Ectopic pregnancy contributed to a mean of 2.5%, 7 cases died due to ruptured ectopic in the postoperative period due to sepsis and the remaining 15 cases died of hemorrhage. The incidence of ectopic pregnancy is increasing and this could be explained by the increment of the predisposing factors and advanced methods of diagnosis. Malaria is a unique cause of indirect maternal death, which accounted for a mean of 37.2%. Worldwide it was high.¹¹ This increase in mortality is

Table 1 - Number of cases and maternal mortality in the 1985-1999.

Year	n of cases	Maternal mortality rate
1985	276	78
1986	283	77
1987	265	73
1988	254	69
1989	250	68
1990	219	62
1991	209	59
1992	202	57
1993	195	55
1994	184	52
1995	150	51
1996	144	49
1997	129	44
1998	123	42
1999	132	41

Table 2 - Distribution of death according to age and party.

Age (years)	Parity	1985-1989		1990-1994		1995-1999	
		Age n (%)	Parity n (%)	Age n (%)	Parity n (%)	Age n (%)	Parity n (%)
≤19	Para I	43 (11.9)	123 (34.1)	37 (12.9)	100 (35.1)	35 (15.2)	83 (35.1)
20 - 34	Para II-IV	206 (57)	108 (29.9)	165 (57.9)	91 (31.9)	136 (58.9)	72 (31.9)
>35	Para V	112 (31.1)	130 (36)	83 (29.2)	94 (33)	60 (25.9)	76 (33)
Total		361 (100)	361 (100)	285 (100)	285 (100)	231 (100)	231 (100)

Table 3 - Causes of death.

Causes	1985-1989		1990-1994		1995-1999		Total (1985-1999)	
	n	(%)	n	(%)	n	(%)	n	(%)
Direct								
Sepsis	115	(31.8)	80	(28.1)	44	(19)	239	(27.3)
Hypertensive disorder	29	(8)	30	(10.5)	16	(6.8)	75	(8.5)
Hemorrhage	18	(4.9)	11	(3.9)	9	(4.3)	38	(4.3)
Rupture of uterus	14	(3.9)	7	(2.5)	5	(2.1)	26	(2.9)
Miscarriage	21	(5.8)	14	(4.9)	9	(4.3)	44	(5.1)
Anesthesia	10	(2.8)	6	(2.1)	4	(1.7)	20	(2.3)
Ectopic pregnancy	7	(1.9)	8	(2.8)	7	(2.2)	22	(2.5)
Pulmonary embolism	4	(1.2)	5	(1.8)	5	(2.2)	14	(1.6)
Tetanus	1	(0.3)	0	(0)	0	(0)	1	(0.1)
Indirect								
Malaria	96	(26.6)	108	(37.8)	122	(52.8)	326	(37.2)
Hepatitis	32	(8.8)	8	(2.8)	5	(2.3)	45	(5.1)
Heart diseases	14	(3.9)	8	(2.8)	5	(2.3)	27	(3.1)
Total	361	(100)	285	(100)	231	(100)	877	(100)

due to malaria endemicity and as pregnant women being more prone to malaria complications than non-pregnant women. Most of the cases died of hypoglycemia, hypotension or hyperpyrexia, few of them died of acute renal failure. Hepatitis accounted for a mean of 5.1% compared to Khartoum study¹⁰ it was very low. Thirty-2 cases died in the postpartum period while 33 cases died before termination of pregnancy. The features were deterioration in the level of consciousness, coma and death. Heart diseases accounted for a mean of 3.1%, 19 patients died in the postpartum period and 8 cases died before delivery. The physician was involved in the management of all cases.

In conclusion, a definite decrease in the incidence of maternal mortality in the 3 different periods is shown in this study. In the last 2 periods, the decrease was remarkable, in spite of major increase in the workload of the department, it is important to stress that the number of preventable cases has decreased to the minimum in the last 2 periods. To understand this overall improvement in maternal mortality, trends of change in prevention and treatment must be sought. The incidence of infection has decreased from 31.8 -19% as a result of renewed stress on aseptic techniques and liberal use of better and potent antibiotics. Hypertensive disorder (eclampsia) has dropped from an incidence of 8-4.3% this is due to better antenatal care. There is no doubt that modern anesthesia with well-equipped theatre has done its part in reducing anesthetic – related deaths from 2.8-1.7%. The increased of the number of elective CS decreases the number of ruptured uterus from 3.8-2.1%. As malaria is an endemic disease in Sudan and being a major factor in morbidity and mortality and due to

adverse effect to pregnant women, we recommended that the problem should be dealt with as a national issue, raising the awareness of the community regarding its hazards and complications through health education and encouraging the use of mosquito nets and availability and accessibility of investigations and treatment.

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Abstract

The maternal mortality rates in the maternity and children's hospital, Riyadh, during the triennia 1978-1980 and 1981-1983 were 52 and 21 per 100 000 births respectively. This progressive improvement is due mainly to the reduction in maternal deaths due to haemorrhage. The main preventable factor in the 1978-1980 study was failure by the patient to seek medical care, whereas in 1981-1983 study, preventable factors were equally shared by the clinician, the patient and the administration. Prompt blood transfusion facilities, a flying squad for transferring patients and regular antenatal attendance, are crucial factors in further improving the maternal mortality rate.