

Maternal deaths at Pelonomi Hospital, Bloemfontein, 1980 - 1985

A survey of 81 consecutive cases

B. F. COOREMAN, H. S. CRONJÉ, C. J. F. GROBLER

Summary

From 1 January 1980 to 31 December 1985, 81 maternal deaths occurred at Pelonomi Hospital, Bloemfontein; these were classified as direct obstetric-related (74 cases), indirect obstetric-related (6) and non-obstetric (1). The overall maternal mortality rate was 2,87 per 1000 deliveries, including deaths related to abortion and ectopic pregnancy, but excluding the non-obstetric death. Among booked patients the maternal mortality rate was 0,32 and among unbooked patients 11,13 per 1000 deliveries. The maternal mortality rate for patients from the Bloemfontein area was 0,72 per 1 000. Puerperal sepsis and postabortal sepsis accounted for 45,7% of the deaths. Avoidable factors were considered to be present in 65 cases (80,2%).

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Pregnancy and delivery are one of the leading causes of death among women in developing communities and, because it is possible to prevent this tragedy by improvement of medical services, maternal mortality is a sensitive socio-economic index of health care in a society.

Pelonomi Hospital, one of the teaching hospitals of the University of the Orange Free State in Bloemfontein, is the main referral centre for the southern two-thirds of the OFS, south-western Transkei, QwaQwa and the Kingdom of Lesotho. About 5 000 women are delivered annually and, since the majority of patients are from a low socio-economic background, maternal mortality is still a major clinical problem.

An investigation was carried out in order to highlight the causes and to identify the preventable factors in maternal deaths at Pelonomi Hospital.

Patients and methods

A retrospective analysis of all maternal deaths from 1 January 1980 to 31 December 1985 was carried out. In this study the World Health Organization definition of maternal death was used, modified by an extension of the postpartum period to 1 year.^{1,2} Maternal death was defined as 'the death of a woman while pregnant or within 1 year 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'. Furthermore, maternal deaths were classified into direct,

indirect and non-obstetric deaths. Direct obstetric deaths resulted from obstetric complications of the pregnant state, from interventions, omissions, incorrect treatment, or from a chain of events resulting from any of the above. Indirect obstetric deaths resulted from previously existing disease or disease developing in pregnancy and not due to a direct obstetric-related cause, but aggravated by the physiological effects of pregnancy. Non-obstetric deaths occurred during pregnancy or the puerperium, but were not classified as direct or indirect pregnancy-related deaths.

The maternal mortality rate is expressed as the sum of the direct and indirect deaths per 1 000 births. Births are defined as births of babies, alive or dead, with a birth weight of 1 000 g or more.³ A booked patient is one who attended at least two antenatal clinics at Pelonomi Hospital. An unbooked patient attended one or no antenatal clinics.

Avoidable factors were considered to be present in those cases where some aspect of the mother's care fell short of the generally accepted standards at that time and therefore contributed to the fatal outcome. It does not mean that death could have been prevented or that the factor itself was a direct cause of the mother's death.

Results

There were 81 maternal deaths. Of these, only 7 patients (8,6%) were booked and all these deaths occurred during the 3rd trimester. Of the 74 unbooked patients (91,4%), 14 presented with complications of abortion, 3 with tubal pregnancies, 1 with a choriocarcinoma; 56 of the 73 were in the 3rd trimester.

Seventy-four cases (91,4%) were classified as direct obstetric deaths (Table I). The triad of sepsis, hypertensive disease and haemorrhage accounted for 65 deaths (80%). The other causes were pulmonary embolism, choriocarcinoma, anaesthetic complications, liver rupture, drug reaction, and obstetric shock. Both patients with obstetric shock were apparently healthy before labour. They developed inexplicable irreversible shock

TABLE I. CAUSES OF DIRECT OBSTETRIC DEATHS

Cause	No. of patients	%
Puerperal sepsis	25	30,9
Postabortal sepsis	12	14,8
Hypertensive diseases	17	21,0
Haemorrhage	11	13,6
Pulmonary embolism	3	3,7
Choriocarcinoma	1	1,2
Anaesthesia	1	1,2
Ruptured liver	1	1,2
Drug reaction	1	1,2
Obstetric shock	2	2,5
Total	74	91,4

Department of Obstetrics and Gynaecology, University of the Orange Free State, Bloemfontein

B. F. COOREMAN, M.MED. (O. ET G.), F.C.O.G. (S.A.)

H. S. CRONJÉ, M.MED. (O. ET G.), F.C.O.G. (S.A.), M.D.

C. J. F. GROBLER, M.MED. (O. ET G.)

and died. Autopsy did not reveal the exact cause of death. Of the 3 patients with pulmonary embolism 2 died postoperatively after tubal pregnancy and 1 patient suddenly collapsed 3 hours after a normal vaginal delivery.

Six deaths (7,4%) were classified as indirect obstetric (Table II). Two of these cases were attributable to pre-existing cardiac disease causing acute heart failure.

TABLE II. CAUSES OF INDIRECT OBSTETRIC DEATHS

Cause	No. of deaths
Cardiac disease	2
Cervical carcinoma	1
Systemic herpes infection	1
Liver disease	1
Fever of unknown origin	1
Total	6 (7,4%)

There was 1 non-obstetric death from thyroid carcinoma.

Thyroid carcinoma was responsible for the 1 non-obstetric death.

Eighty patients were considered for calculating the maternal mortality rate (excluding the 1 non-obstetric death). During this 6-year period 27 896 confinements were registered. The overall maternal mortality rate therefore was 2,87 per 1 000 deliveries. Booked patients accounted for 21 337 confinements with a maternal mortality rate of 0,32 per 1 000 deliveries, whereas the rate for unbooked patients was 11,1 per 1 000 deliveries. Taking into account only those patients residing in the Bloemfontein area, the maternal mortality rate was 0,72 per 1 000 deliveries.

Autopsies were performed on 20 patients (24,7%).

The age and parity distribution are given in Tables III and IV. In the group of 80 patients with obstetric deaths, 30 were delivered vaginally, 23 by caesarean section, 4 by hysterotomy. One patient had a hysterectomy, and 12 patients had evacuation following abortion, and 3 salpingectomy for tubal pregnancy. Five patients died before delivery and 2 before evacuation. The place of death in the hospital was the intensive care unit (38 patients), gynaecology ward (13 patients), postnatal ward (9 patients), operating room (8 patients), labour room (4 patients), antenatal ward (2 patients), casualty department (2 patients), and unknown (5 patients).

TABLE III. AGE OF PATIENTS

Age (yrs)	No. of patients	%
15 - 19	13	16,0
20 - 24	28	34,6
25 - 29	11	13,6
30 - 34	15	18,5
35 - 39	9	11,1
> 40	5	6,2

Preventable factors were identified in 65 patients (80,2%). In some patients, more than one factor was identified. These were divided into factors attributable to the patients, the peripheral hospital or Pelonomi Hospital. Factors attributable to the patient included late presentation (22 deaths), refusal of treatment (3), and the unbooked state (14), a total of 39 deaths or 48% of all patients. Peripheral hospital factors included a failure in diagnosis (3 deaths), failure to institute appropriate

TABLE IV. PARITY OF PATIENTS

Parity	No. of patients	%
0	36	44,4
1	9	11,1
2	5	6,2
3	4	4,9
4	2	2,5
> 5	12	14,8
Unknown	13	16,1

treatment (11), and delay in transfer (9), a total of 23 deaths or 28,4% of all patients. Preventable factors at Pelonomi Hospital included failure or delay in diagnosis (6 deaths), failure or delay in surgery (8), failure to institute appropriate treatment (6), poor operative technique (3), over-transfusion (3), blocked endotracheal tube (1), and anaesthetic complication (1), a total of 28 deaths or 34,5% of all patients. In 6 patients no preventable factor could be identified, and 10 deaths were classified as unknown in respect of preventable factors.

Discussion

Maternal mortality rates in developing countries should not be compared with those in developed countries. Socio-economic structures differ enormously between these two groups. In southern Africa, a considerable proportion of the population do not seek antenatal care even when it is readily available, and prefer delivery at home. Traditional medicine and witch-doctors still play important roles, and classic medicine is often only sought as a last resort. These are important factors contributing to the extremely high maternal mortality rate of unbooked patients, which was 35 times higher than that of booked patients in this study.

In developing countries, maternal mortality rates for booked and unbooked patients vary from 1,5 per 1 000 deliveries in Lusaka, Zambia,⁴ to 3,3 and 0,5 per 1 000 deliveries in Harare, Zimbabwe.^{5,6} From other parts of the RSA figures of 4,5 (Pietermaritzburg) and 0,9 and 2,2 (Durban) per 1 000 deliveries have been reported among low socio-economic groups.^{7,8} The overall figure of 2,87 per 1 000 deliveries in this study compares favourably with the abovementioned studies. The figure of 0,32 per 1 000 deliveries for booked patients also compares favourably with results from developed countries which vary between 0,10 and 0,50 per 1 000 deliveries.⁹

An important finding in this study was the high proportion of patients dying from sepsis (45,7%), more than in any other report from southern Africa. Two-thirds of these deaths occurred in patients in the puerperium and one-third were after abortion. Other causes of maternal mortality in this study correlated well with causes in other studies from populations with similar characteristics.⁶⁻⁸ Russel's¹⁰ statement: 'The same lessons are still to be learnt, lessons that have been emphasized repeatedly in earlier reports,' is also true for this study.

To combat maternal mortality in this area successfully attention needs to be focused on three aspects: (i) the patient; (ii) rural hospitals; and (iii) Pelonomi Hospital. To accomplish this, the following measures are proposed: (i) health education for the general population, with special attention to pregnancy; (ii) availability and accessibility of antenatal care for all women; (iii) early recognition and adequate management of high-risk patients; (iv) early consultation in problem cases, with timely referral to Pelonomi Hospital when indicated; (v) creation of a central flying squad service since Pelonomi Hospital's referral area covers long distances; (vi) continuing medical education

for doctors and midwives with upgrading of certain rural hospitals to serve as regional hospitals; and (vii) special efforts to obtain more complete reporting of all pregnancy-related deaths in South Africa.

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