MATERNAL MORTALITY – A REVIEW AT THE DEPARTMENT OF OBSTETRICS AND GYNAECOLOGY, ALEXANDRA HOSPITAL, SINGAPORE

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ABSTRACT

Maternal mortality rate is a sensitive index of the prevailing health conditions and general socio-economic development of the country. The present study was undertaken to see the trends in maternal mortality at the Department of Obstetrics and Gynaecology, Alexandra Hospital during a 11-year period from January 1978 until December 1988. There were 14 maternal deaths during this period.

Keywords: Maternal mortality, pregnancy, abortion.

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INTRODUCTION

A maternal death is one that is attributed to pregnancy or child birth. Definition varies from one country to another but it is considered generally that the death occurs in association with pregnancy or child bearing or within the six weeks of puerperium (the definition used by the Federation of International Gynaecologique et Obstetrique) (1). Maternal mortality rate in this study has been defined as the number of maternal deaths, that is deaths due to deliveries and complications of pregnancy, childbirth and the puerperium per thousand live-births and stillbirths.

The maternal mortality rate has been dropping since over the last century. In 1979 it was 0.15 per thousand total births in England and Wales or 15 in every hundred thousand births (1). Much of this improvement has been attributed to the better health of the population and improved nutrition. Better obstetrical training, the increased use of blood transfusion and antibiotics are some of the factors responsible for this falling maternal mortality rates.

MATERIALS AND METHODS

All the maternal deaths that occurred in the Department of Obstetrics and Gynaecology from January 1978 until December 1988 were analysed. During this period there were 40,155 live births and stillbirths and 14 maternal deaths (Table I). The maternal mortality rate was 0.3 per thousand births. There were 3 cases of maternal deaths due to haemorrhage which included one case of abdominal pregnancy, 3 cases due to congestive cardiac failure due to severe pre-eclampsia, 3 cases of amniotic fluid embolism, one case of pulmonary embolism (Table II). There were 4 maternal deaths due to associated causes (Table III). Autopsy was carried out in 13 cases (93%).

Table I
MATERNAL DEATHS FROM 1978 — 1988

Year	No. of Deaths
1978	2
1979	2
1980	3
1981	Nil
1982	1
1983	2
1984	1
1985	1
1986	Nil
1987	1
1988	1
Total	14

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Table II
AUTOPSY CAUSE OF DEATH FROM 1978 — 1988

Cause of Death	No.	%
1. Congestive Cardiac Failure due to severe pre-eclampsia	2	14.3
2. Traumatic Retro-peritoneal haemorrhage	1	7.1
3. Acute Myocarditis	2	14.3
4. Haemorrhage following abdominal pregnancy	1	7.1
5. Amniotic fluid embolism	3	21.6
6. Disseminated Intra-vascular coagulation	2	14.3
7. Pulmonary Embolism	1	7.1
8. Acute Yellow Atropy of Liver	1	7.1
*9. No Autopsy	1	7.1
Total	14	100.0

* Cause of death signed up as Congestive Cardiac Failure due to Severe Pre-eclampsia.

Table III
ASSOCIATED CAUSES OF MATERNAL DEATH

Cause of Death	No.
Acute yellow atrophy of liver and renal failure	1
Viral Myocarditis	2
Traumatic retroperitoneal haemorrhage	1
Total	4

RESULTS

Haemorrhage

In 3 out of 14 maternal deaths, death was directly attributed to haemorrhage. In 2 cases maternal death occurred due to severe postpartum haemorrhage as a result of intravascular disseminated coagulation. Both the cases were multiparous and booked patients. The first patient had a normal vaginal delivery at 39 weeks gestation without oxytocin augmentation. The second patient had an elective caesarean section done for previous caesarean section due to poor progress in labour. During LSCS the placenta was found to be firmly adherent to the uterus. Placenta was removed in piecemeal and haemostasis was obtained. The patient collapsed in the postoperative ward and a caesarean hysterectomy was subsequently carried out. However, the patient developed severe DIVC during the postoperative period.

The third case of haemorrhage was due to ruptured abdominal pregnancy. This patient had two normal vaginal deliveries and was admitted to the hospital for the management of transverse lie at 32 weeks gestation. She remained as a transverse lie and a decision was made to do an elective caesarean section at 38 weeks. However, the patient was found to be in a state of shock at 33 weeks gestation and a laparotomy showed massive bleeding from a ruptured abdominal pregnancy.

Hypertensive disease of Pregnancy

There were 3 cases in this study who developed congestive cardiac failure due to severe pre-eclampsia. All the 3 patients were multiparous and unbooked cases. They were in severe congestive cardiac failure on admission with uncontrolled hypertension.

Amniotic fluid Embolism

Two maternal deaths occurred following caesarean sections and one immediately after intubation. In all the 3 cases autopsy confirmed amniotic fluid embolism.

Pulmonary Embolism

There was one death due to pulmonary embolism. She had a caesarean section which was uneventful. The patient collapsed and died during 3rd postpartum day.

Associated Causes

a) Traumatic Retroperitoneal Haemorrhage

35 years old Gravida 3 Para 2 at 30 weeks gestation was admitted to the labour ward with abdominal pain and breathlessness of 2 days duration. The patient was found to be very pale and the foetal heart was not heard. There was no history of trauma. She died on the same day in spite of active resuscitation. Autopsy showed massive retroperitoneal haemorrhage.

b) Acute yellow atrophy of the liver

The patient, an unbooked case, was admitted to the antenatal ward at 32 weeks gestation with fever, chills and rigors. She was found to be comatose on admission. She went into spontaneous onset of labour and delivered a macerated stillbirth and died 24 hours after delivery.

c) Acute Viral Myocarditis

There were 2 cases of maternal deaths from acute viral myocarditis. One of them had 2 previous caesarean sections and twin pregnancies. She had gross oedema of both legs and was advised admission. She defaulted follow up. The second patient was an unbooked, multiparous patient with unknown gestation. Both of them were brought in dead to the Emergency Department. Autopsy showed acute myocarditis.

DISCUSSION

The incidence of maternal mortality varies from country to country and figures for maternal mortality (incidence per 1000 live births) from some countries are given below.

a) 3.7 from Uganda (3)
b) 9.8 from Nigeria (4)
c) 1.0 from Rotunda Hospital Dublin (5)
d) 2.5 from South Iran (6)
e) 3.9 from an Israel Hospital (7)

The incidence of maternal mortality rate in the present study which is 0.3 per thousand births is very low compared to the above figures. Deaths from

haemorrhage should now be avoidable in most instances. Failure to intervene to perform hysterectomy in cases of atonic postpartum haemorrhage and inadequate transfusions still appear to be a major problem in maternal deaths occurring as a result of postpartum haemorrhage.

In reviewing the data from 1977 to 1986 published by the Registrar General of Births and Deaths, Singapore (8). Haemorrhage of Pregnancy and Childbirth appeared to be the most common cause of maternal death in Singapore. In contrast, haemorrhage only appeared to be the 6th main cause of death in a report published by the confidential enquiries into maternal deaths in England and Wales, 1979-1981 (9).

Severe postpartum haemorrhage leading to DIVC still appears to be a problem in Singapore. Postpartum haemorrhage due to coagulation failure is a serious, life threatening condition. Early diagnosis is very essential so that immediate treatment can be instituted. Coagulation failure as the cause for postpartum haemorrhage must be suspected when a patient suddenly goes into a state of circulatory collapse and there is atonic postpartum haemorrhage. In both the cases in this series, a timely hysterectomy could have avoided both the maternal deaths. The decision when to perform a hysterectomy in cases of severe postpartum haemorrhage appears to be a crucial factor in avoiding maternal deaths.

ABDOMINAL PREGNANCY

Advanced abdominal pregnancy (20 weeks of gestation and beyond) is a rare occurrence. Because of its rarity, it is seldom thought of in the routine obstetric practice. Thus cases that do present are often missed until complications arise. Maternal age and parity are not helpful in the diagnosis of the condition. The only symptoms of any help were amenorrhoea, lower abdominal pain and failed induction of labour. Abdominal pregnancy may occur by primary implantation of the fertilized ovum in the peritoneal cavity, but this is extremely rare. The majority of cases are usually secondary, in that the pregnancy is first implanted, in the tube, ovary or uterus followed by tubal abortion, tubal rupture or uterine rupture.

The reported incidence of abdominal pregnancies varies and the incidence at Alexandra Hospital was 1 in 62,110 deliveries. Factors thought to influence the incidence include standard of obstetric care, socio-economic and racial factors and treatment of salpingitis with antibiotics.

In the present study, except for the fact that she was found to be in transverse lie at 32 weeks, she remained absolutely asymptomatic. Even though an ultrasound scan was done on admission, it was found to be unsatisfactory and she was scheduled for another ultrasound appointment. Ultrasound is an important diagnostic tool but the diagnosis becomes certain only when the uterus can be shown to be separate from the pregnancy sac.

Early palpable foetal parts is another sign which is often quoted in the diagnosis of abdominal pregnancy. Although early palpable foetal parts should raise the clinical suspicion, many cases in fact present with unusual difficulty in palpating the foetal parts due to decreased amount of liquor as happened in this case. On the contrary, a lax multiparous uterus with a normal pregnancy can present with foetal parts which are easily felt. The ease of palpating foetal parts is therefore unreliable in making a diagnosis of abdominal pregnancy. In retrospect, it appears that a "high index of suspicion" and "thinking ectopic" are the keywords in the diagnosis of abdominal pregnancy.

Amniotic fluid embolism also appears to be one of the main causes of death in this series. The reasons for the sequence of events which follow amniotic fluid embolism have been argued at length but can be summarized in two theories. One is the overwhelming mechanical blockage of the pulmonary vessels by emboli and the other, an anaphylactic reaction to the particular matter in the amniotic fluid (10). The predisposing factors to the fatal condition include uterine stimulants, meconium in the amniotic fluid, intrauterine death, advancing age of the mother and multiparity. There is a marked association with precipitate labour or exceptionally strong uterine contractions. Several authors (11) have alluded to uterine stimulants as an aetiological factor in the production of precipitate labours. It is only prudent to augment labours with low dose oxytocin starting with either 0.5 or 1 mU per minute using an automatic infusion pump.

Even though oxytocin was not used in all the 3 cases of maternal deaths due to amniotic fluid embolism in this study, cases undergoing surgical induction followed by oxytocin infusion should be very carefully monitored to avoid this catastrophic incident.

Pulmonary embolism is still an enigma snatching away some mothers without prior warning. But despite our ignorance of its aetiology, the maternal mortality rate from pulmonary embolism is still improving. The evidence suggests the special dangers of obesity, prolonged rest in bed in pregnancy (often because of pre-eclampsia or hypertension) and caesarean section.

Deaths from hypertensive disorders of pregnancy are often attributed to poor antenatal care. So much so, all the three maternal deaths in this series did not receive any form of antenatal care. All the 3 deaths could have been avoided if they had been seen earlier during their pregnancy.

The risk of maternal mortality from pregnancy and child births has shown a steady decline during the last decade, even though haemorrhage still appears to be a major cause of death. Although maternal mortality has been reduced, the risk still persists. Continued effort in mortality surveillance and health education is necessary to reduce the maternal mortality still further (12).

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