

# Essential Management of Obstetric Emergencies

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## Preface

Most writings approach obstetric care from the viewpoint of the large well-equipped hospital. In fact, most obstetric emergencies originate outside the hospital and in many parts of the world have to be dealt with, at least initially, in nursing stations or smaller hospitals. While this book carries the management through to the level of care available in the large teaching hospital, I have tried also to outline the appropriate treatment when limited facilities are all that are available. This book is therefore directed at those who may be involved with obstetric emergencies at all levels of care: nurses, family practitioners, and obstetricians in training. Rather than provide only a list of management, I have tried to outline the pathophysiology so that the clinical presentation and rationale for the advised treatment are understood. Having done this, I have been somewhat dogmatic in the sections on management as a positive and decisive course of action is needed when dealing with any emergency. I have not provided an exhaustive list of references but named a few relevant articles for readers who seek a wider view of the topic.

I have mixed feelings towards my brother Peter's role in this book. As Wiley's adviser in emergency medicine, he asked me to produce this volume as the first in a series, each of which will cover a different area of emergency care. He therefore involved me in a year's hard work, but on the other hand I have learned much and benefited greatly from his enthusiasm and guidance. The publishers have also earned my gratitude for their unobtrusive and helpful direction.

Much of my own experience with obstetric emergencies was gained during a 10-year period as a consultant in obstetrics and gynaecology to a remote area of the Canadian north. It is to the people of this area that I dedicate this book.

T. F. BASKETT

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## CHAPTER 1

# Maternal and perinatal mortality

Maternal and perinatal mortality rates indirectly reflect the socio-economic and health service standards of a country. Unfortunately, in developing countries the statistics are often unavailable or inaccurate, whereas in developed countries definitions are not standardized, so that comparisons may be meaningless. It is not intended to cover the causes of maternal and perinatal mortality in detail but to cover trends and highlight the main threats to the mother and baby.

## MATERNAL MORTALITY

### DEFINITIONS

In recent years attempts have been made to standardize the definition of maternal death. The most widely accepted is that endorsed by both the World Health Organization and the International Federation of Gynaecologists and Obstetricians: '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.' In the United States most agencies use a 90-day limit and in Britain deaths up to one year after delivery are reviewed. There is evidence that extending the review beyond 42 days in the puerperium will significantly increase the detection of maternal deaths.<sup>1,2</sup>

The maternal mortality rate is expressed as the number of maternal deaths per 100,000 live births. Maternal deaths may be further subdivided:

Direct obstetric deaths are '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'. For example: abortion, ectopic pregnancy, hypertensive diseases of pregnancy, antepartum and post partum haemorrhage, and puerperal sepsis.

**Indirect obstetric deaths** are 'those resulting from previous existing disease or disease that developed during pregnancy and which was not due to direct obstetric causes, but was aggravated by physiologic effects of pregnancy'. For example: anaemia, cardiac disease, and diabetes.

**Non-obstetric (unrelated or fortuitous) deaths** are from accidental or incidental causes. For example: motor vehicle accident, malignancy, and unrelated infectious diseases. Non-obstetric deaths are not included in most maternal death statistics.

Of all women dying in pregnancy and the puerperium approximately 50% are direct, 25% indirect, and 25% non-obstetric deaths.

Many national statistics report only direct obstetric deaths and it is estimated that even countries with well-developed reporting systems will miss 15-50% of maternal deaths.

## MAIN CAUSES OF MATERNAL DEATH

Probably the most complete and accurate statistics of maternal mortality come from the reports on confidential enquiries into maternal deaths in England and Wales. The report of 1976-78 (the latest published at the time of writing) on 427 deaths revealed the leading causes to be:

1. Pulmonary embolism
2. Anaesthetic related
3. Hypertensive disease of pregnancy
4. Haemorrhage (post partum > antepartum)
5. Ectopic pregnancy
6. Abortion
7. Sepsis
8. Amniotic fluid embolism
9. Uterine rupture

In the United States the main causes are sepsis, haemorrhage, hypertensive disease of pregnancy, ectopic pregnancy, and abortion.

## PERINATAL MORTALITY

A stillbirth is caused by factors in the antenatal or intrapartum course of pregnancy. A neonatal death may be due to similar factors, in addition to the availability and quality of neonatal care. As maternal death rates have fallen the perinatal mortality rate has become a better marker of the standard of obstetric care.

## DEFINITIONS

Perinatal mortality definitions have been even more variable than those of maternal mortality, so that comparisons between countries and even regions of the same country are fraught with statistical pitfalls. Many of these are based on legal definitions.

The following definitions are suggested by the World Health Organization and the International Federation of Gynaecologists and Obstetricians and should be used:

**Stillbirth rate:** The number of stillbirths weighing  $\geq 500$  g per 1000 total births.

**Early neonatal death rate:** The death of a liveborn baby  $\geq 500$  g within 7 days of birth per 1000 live births.

**Late neonatal death rate:** The death of a liveborn baby  $\geq 500$  g within 28 days of birth per 1000 live births.

**Perinatal mortality** is the sum of all stillbirths and neonatal deaths, and has two accepted definitions:

**Standard perinatal mortality rate:** The number of stillbirths and early neonatal deaths  $\geq 1000$  g per 1000 total births. This is the definition recommended for international comparison.

**Extended perinatal mortality rate:** The number of stillbirths and late neonatal deaths  $\geq 500$  g per 1000 total births. This is a more sensitive indicator of the standard of obstetric care and should be used whenever possible.

## MAIN CAUSES OF PERINATAL DEATH

### LOW BIRTH WEIGHT

This is the most common factor involved in perinatal death, although there may be many different antecedents:

1. Spontaneous premature rupture of the membranes and/or premature labour.
2. Intrauterine growth retardation.
3. Induced labour because of antenatal complications such as hypertensive disease, antepartum haemorrhage, blood group incompatibilities, etc. These and other antenatal complications may, of course, also lead to spontaneous premature labour and intrauterine growth retardation.

The main causes of death among the low birth weight are extreme immaturity, respiratory distress syndrome, intraventricular haemorrhage, and sepsis.

### INTRAUTERINE ASPHYXIA

This is still a major cause of perinatal death, particularly stillbirth. In many cases there are clinical factors leading to failure of placental oxygen transfer. These may be acute (abruptio placentae, cord prolapse) or more insidious (hypertensive disease, prolonged pregnancy). Death may occur before

labour, or the hypoxia may only become manifest during the stress of labour when the uterine contractions cause a reduction in intervillous space blood flow. If the baby does not die *in utero*, fatal hyaline membrane disease and/or intraventricular haemorrhage secondary to the hypoxia may occur early in the postnatal period. In several cases of stillbirth there are no clinical antecedents and autopsy shows only non-specific changes of hypoxia but no other fetal or placental pathology. Such 'unexplained' cases form an increasingly large (30–50%) proportion of all stillbirths.

## CONGENITAL ANOMALIES

As other causes are reduced, this group produces about 20–25% of all perinatal deaths—particularly those in the neonatal period. The frequency of the different types of abnormalities varies in different countries, but the most common are central nervous system, cardiac, chromosomal, and multiple system anomalies.

## FACTORS ASSOCIATED WITH MATERNAL AND PERINATAL MORTALITY

**Age:** There is an increased risk of maternal and perinatal death at the extremes of reproductive age. The teenage mother has a slightly increased risk and the woman over 35 years a much greater risk than the ideal 20–30 age group.

**Parity:** The risk is slightly increased in the first pregnancy and greatly increased in fifth and subsequent pregnancies.<sup>3</sup>

**Socio-economic:** In all countries those at the lower end of the socio-economic scale have a greater risk of death in pregnancy. The possible reasons for this are many: poor nutrition, poor housing and sanitation, less likely to seek or, in countries where this is required, be able to afford obstetric care.

**Geography:** In some countries this is an important factor. It is impossible to provide sophisticated maternity care to patients living in remote areas. This has been shown in the Canadian north and other countries, although with careful application of resources the risks can be reduced.<sup>4,5,6</sup> In many instances poor socio-economic conditions and higher age and parity are linked to geographic isolation.

**Obstetric care:** All studies show a very significant relationship between a lack of antenatal care and a higher maternal and perinatal mortality. This is one of the biggest factors and has an important bearing on all the other associated factors. For example, the unmarried teenage primigravida's increased risk can be eliminated if she seeks and receives good obstetric care.

**Smoking:** Women who smoke have a slightly higher perinatal mortality. Whether this is due to some unknown adverse characteristics of women who choose to smoke, or the smoking *per se*, is unclear.

## REDUCTION OF MATERNAL AND PERINATAL MORTALITY

The improvement in maternal mortality figures in developed countries has been impressive. Indeed it is a reflection of the degree of improvement that maternal deaths, once expressed per 1000 births, are now so rare that they are expressed per 100,000 births. In Australia, Britain, Canada, and the United States the direct obstetric death rate is about 10 per 100,000 live births. This represents an eightfold improvement in the last 25 years and a 50–60 fold improvement in the last 50 years.

Perinatal mortality rates have also dropped, but not so precipitously. Over the past 50 years there has been a four-to-fivefold decrease in perinatal deaths, with an accelerated reduction over the past 10–15 years. In developed countries the standard perinatal mortality rate should be below 10 per 1000 total births.

The main reasons for this improvement are:

- Better socio-economic conditions.
- Lower age and parity.
- The increased provision and utilization of obstetric services and hospital delivery.
- Better neonatal services—this has been a big factor in producing the gains over the past 10–15 years.
- Safer anaesthesia.
- Blood transfusion.
- Antibiotics.
- Maternal and perinatal death reviews.

Further improvements in maternal and perinatal mortality can be expected with emphasis on the following:

1. In developing countries the maternal and perinatal mortality rates are so appallingly high that even the provision of very basic maternity services will produce great improvement. However, even in countries with freely available, sophisticated medical services the irreducible minimum of mortality has not been reached as demonstrated by the fact that 50–75% of all maternal, and 25–50% of all perinatal deaths, are due to ideally preventable factors.

The biggest gains are not going to be made by advances in sophisticated medical technology but by the efficient and equitable application of currently existing knowledge and techniques. The organization of local resources and regionalization of care suitable for the socio-economic and geographic conditions are obviously the main factors. Careful selection and referral of high risk pregnancies to the appropriate level of perinatal care is important.

2. Continued improvement of socio-economic conditions should bring a concomitant increase in the standard of general health, nutrition, housing, and education.
3. A careful and critical review of all maternal and perinatal deaths is essential, no matter how small the hospital. These reviews should be carried out as a fact-finding, rather than a fault-finding, exercise. This is a most important principle. A careful review will often pinpoint avoidable factors that may be prevented in future cases. In assigning a death as preventable under ideal circumstances, most reviews will single out one or more of three potentially avoidable factors: medical management, medical facilities, and patient actions. The educational value of such reviews is considerable. At a regional and national level proper data collection and analysis will identify the main causes of death and guide relocation of resources or concentration of effort.
4. Adequate training of personnel destined to look after pregnant women, along with continuing education and support.

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## CHAPTER 2

# Antenatal care and risk identification

Good antenatal care is the cornerstone of management aimed at reducing maternal and perinatal mortality and morbidity. The main principles will be outlined here:

### AIMS OF ANTENATAL CARE

1. **Complete medical examination:** This may be the first opportunity, in several years, for a thorough general medical assessment of the patient. It should always be remembered that the physiological stresses imposed by pregnancy may unmask latent disease: e.g. rheumatic heart disease, gestational diabetes. The course of a medical disease may be worsened by pregnancy or the disease itself may jeopardize the developing fetus.
2. **Obstetric examination:** The pelvic examination in early pregnancy has the following aims:
  - To confirm the diagnosis of pregnancy.
  - To assess the uterine size and confirm gestational age.
  - To rule out concomitant gynaecological disease.
  - To take appropriate cytology and bacteriology specimens.
3. **Early detection of pregnancy complications:**
  - Pre-eclampsia.
  - Rhesus and other isoimmunization.
  - Multiple pregnancy.
  - Malpresentations.
  - Anaemia.
  - Intrauterine growth retardation.
4. **Patient education:** Advice regarding nutrition, breast feeding, smoking, alcohol, drugs, exercise, and intercourse can be incorporated into antenatal classes.
5. **Engender confidence toward pregnancy, labour and motherhood:** Much of this is provided by those directly looking after the patient but good antenatal and postnatal classes can be of great help.
6. **Risk assessment and appropriate plan for antenatal care and delivery.**



## HISTORY AND EXAMINATION

### FIRST VISIT

#### Menstrual History

This is a crucial part of the history as it is the most likely source of the correct gestational age. The features to note are:

- First day of last menstrual period.

If not specifically asked, many patients will give the date of the end of the period as their 'last menstrual period'. In the case of a seven-day period this would alter the calculation of the expected date of confinement by seven days.

- Normality of last menstrual period.

An implantation bleed may occur at about the time of the expected period (i.e. about 10–14 days after ovulation). This is almost always much lighter and shorter than a normal period. If an implantation bleed is mistaken for a true period, the gestational age calculation would be behind by about four weeks.

- Cycle duration and regularity.

The calculation of gestational age is based on a normal 28-day cycle. Patients with a variable cycle, particularly oligomenorrhoea, will require an adjustment to this calculation.

- Cycle interruption.

A calculation adjustment is needed in those patients who have not re-established regular cycles after pregnancy, lactation or the contraceptive pill.

#### Family History

The family history may reveal factors that increase the likelihood of maternal complications or fetal abnormalities:

- Twins
- Diabetes mellitus
- Hypertension
- Hereditary disease

#### Past Medical History

Past or current medical disorders may threaten the mother and fetus, for example:

- Epilepsy
- Rheumatic fever
- Renal disease