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A Strategy for Reducing Maternal Mortality

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A confidential system of enquiry into maternal mortality was introduced in Malaysia in 1991. The methods used and the findings obtained up to 1994 are reported below and an outline is given of the resulting recommendations and actions.

A confidential system of enquiry into maternal mortality, based on that used in England and Wales, was introduced in Malaysia in 1991 with a view to identifying deficiencies in care and recommending remedial measures.

In public hospitals the system requires a named maternal death coordinator to review every instance of mortality in women aged between 15 and 49 years and to decide whether a maternal death investigation is required; the patient's notes are examined to see if amenorrhoea has occurred. Instances of death at home are reviewed by the community health coordinator in the district concerned; this process includes interviewing family members. The coordinators present their findings to the obstetricians in the hospitals that provided care for the patients or to the district medical officers. The regional maternal and child health officer, who is initially contacted by telephone and subsequently in writing, passes the information to a regional review committee, which sends a confidential report on the cause of death, areas of substandard care, and necessary remedial actions to the National Technical Committee. This body produces an annual report including recommendations aimed at reducing maternal mortality and holds discussions on their implementation with various agencies. Issues of general concern are notified to equality to assurance committees in the administrative regions without reference to specific individuals or hospitals.

Notification of deaths in private hospitals is given by the police and an investigation is conducted by district health staff. Although participation in the enquiry process is not compulsory for private hospitals, almost all cooperate to some degree.

For cultural and religious reasons, postmortem examinations are not usually performed in Malaysia. Deaths are classified in accordance with the International classification of diseases, 9th edition.

For present purposes a maternal death is defined as the death of a woman pregnant or within 42 days following 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. Direct maternal deaths are those resulting from obstetric complications of pregnancy, labor and the puerperium. Indirect maternal deaths are those resulting from either a previously existing disease or from a disease that develop and is aggravated during pregnancy. Deaths resulting from causes unrelated to or uninfluenced by pregnancy, called fortuitous deaths, are excluded from the present analysis.

Deaths and Their Causes

Over the period 1991-1994 there were reported maternal deaths, 808 of them direct, 121 indirect, and the rest fortuitous. The maternal mortality ratios for the successive years were 44, 48, 46 and 39 per 100 000 live births. It should be noted that the ratio for 1990, based on data collected before the confidential enquiry system began, was only 20 per 100 000; the apparent increase that occurred subsequently is attributable to improved surveillance. The ratios ranged from 15 to 77 per 100 000 live births in different regions. The values were 54, 36 and 95 per 100 000 live births in mothers aged 19 or less, 20-34, and 35 or over respectively. For primigravidas, paras 1-4 and para 5 and above, the ratios were 38, 43 and 65 per 100 000.

The principal causes of maternal death were postpartum haemorrhage, hypertensive disorders of pregnancy, obstetric pulmonary embolism, and associated medical conditions, accounting for 24%, 16%, 13% and 17% of deaths respectively. Among the direct causes, postpartum haemorrhage was responsible for 29% of the instances, hypertensive disorders of pregnancy for 20%, pulmonary embolism for 12%, and puerperal sepsis for 8%. The haemoglobin level was below 11 g/dl in 20% of the mothers who died. With regard to indirect causes, cardiovascular diseases accounted for 63% of deaths, while 14% and 9% resulted from infections other than puerperal sepsis and from connective tissue diseases resprctively.

An analysis of the 375 deaths that occurred in 1992 and 1993 showed that the maternal mortality ratio was 53 per 100 000 live births for deliveries performed at home, whereas ir was 36 per 100 000 in government hospital and 21 per 100 000 in private institutions.

Care was initially categorized as substandard if the National Technical Committee considered it inappropriate or deficient, taking into account the

standards of care applicable in the year when death occurred. Where it was considered that death would have been preventable if patient or her family had acted appropriately, or there were other socio-cultural, physical and geographical factors contributing to the outcome which were beyond the control of physicians, the term "substandard care" was not applied. As from 1994 the term "remediable factors" was introduced for factors previously referred to under the heading of "sun standard care", and the terms "remediable patient factors" and "personnel and facility factors" were introduced as categories of contributory factors.

Substandard care was identified in 52% of the 721 cases of maternal mortality reviewed during 1991-1993. Of 130 instances of substandard care in 1993, poor clinical management was associated with 101, inadequate resuscitation and delayed surgical intervention with 54, and delayed or no specialist consultation and referral with 53; in 12 instances there was inadequate treatment of hypertensive disorders of pregnancy. Contributory factors were associated with 27% of the deaths.

Inadequacy of home visits was noted in respect of 2.4% of instances in the antenatal period and for 3.4% overall, usually resulting from a breakdown of supervision. Failure in defaulter tracing during the postpartum period in general hospitals was to blame in 0.5% of instances; contributory patient factors were significant in this connection.

The absence of an obstetrician and a gynecologist was noted in 6% of cases. In 1.3%, no medical officer with experience in anesthesia was available, and in 1% no physician was on site. With regard to facilities the main concerns were with blood banks and intensive care units in both the private and public sectors.

Remoteness or inaccessibility was a factor in 7.2% of cases. In 4% there was no transport at all and in 2% transport was not immediately available. Non-compliance with advice seemed to be a significant problem during the antenatal period in the primary care sector.

Of the 208 deaths reported in 1994, 109 were linked to remediable factors in the clinical setting. Factors connected with personnel and facilities were noted in 53 cases, and factors associated with patients in 59 cases. Shortcomings in teamwork among health personnel included failure to:

- delegate duties appropriately;
- inform seniors;

- inform other specialists;
- achieve satisfactory combined care;
- communicate effectively.

These deficiencies, which occurred mainly in district and general hospitals, accounted for 27% of the remediable factors.

A lack of clinical acumen was detected in several cases in both the public and private sectors, involving failure to diagnose, failure to appreciate the severity of a patient's condition, therapy that was inadequate, inappropriate or delayed, and failure to adhere to protocols. A significant proportion of these problems occurred in the postpartum period.

What can be done?

There is a clear need for continuing education of staff in the public and private sectors in order to improve clinical acumen and the management of difficult cases. Vigilance has to be maintained during the postnatal period, and it is important to development new protocols and to prioritize those that already exist. Staff should first of all familiarize themselves with the protocols on management of postpartum hemorrhage and hypertensive disorders of pregnancy. Special training is given to the medical and administrative personnel whose cooperation is essential for the functioning of the investigation system.

It is worth underlining the significance of the confidential nature of the investigation for both patient and care-givers. In this type of enquiry it is important to guarantee that no punitive action ensues, otherwise there would be little prospect of obtaining complete information.

Since 1995 there has been a requirement to enter the pregnancy status of a deceased women on the death certificate. This overcomes the problem that existed previously of determining whether a women who died was pregnant or in the puerperium.

Improved care is offered to mothers at particular risk of death and morbidity. In Malaysia the risk approach involves the use of four color codes denoting a range of severity of obstetric problems and providing a practical guide to nursing staff which enables them to identify cases requiring the attention of a physician. A checklist is used which facilitates the early detection of complications in the antenatal, intrapartum and postpartum periods. There is a clear need for fertility regulation in high-risk groups such as grand multiparas and older mothers. I

however, the absolute numbers of deaths are higher among women who are not classified as being at high risk.

Deaths from postpartum hemorrhage were often associated with substandard care, and in most cases there was a delay in providing suitable care. Almost half of these deaths were in mothers who delivery at home, often in areas where access was difficult. Many of the women who delivered at home were in the high-risk category and many refused hospital care. The establishment of facilities for staying in hospital before delivery and of alternative birthing centers in rural areas has therefore been recommended. Some women delivered in private institutions where the facilities for resuscitation were inadequate. This matter is being dealt with in a review of the legislation on such institutions.

Because many mothers were managed by relatively inexperienced doctors who either did not institute treatment early enough or failed to consult senior colleagues until it was too late, it has been recommended that all hospitals should have a system for rapidly calling on the services of personnel, including blood band and anesthesia staff. Obstetric trauma contributing to postpartum hemorrhage and uterine inversion often arose because staff were inexperienced and failed to observe standard practice. In many cases of hypertensive disorders a more active or aggressive management of the mothers would have prevented deaths.

Although sudden collapse was frequently attributed to obstetric pulmonary embolism, the deaths actually confirmed by postmortem examination as being linked to this condition was very small. It is recommended that a distinction be made between confirmed cases of the condition and those clinically suggestive of it.

There is an urgent need for routine postmortem examinations but various legal, social and religious factors stand in the way. A limited postmortem examination, involving, for example, lumbar puncture, can be performed in the absence of clear consent.

Deaths from puerperal sepsis were usually associated with risk factors, among them instrumental or complicated delivery, manual removal of the placenta, or diabetes mellitus. In several instance the occurrence of persistent fever during the puerperium was not accorded the significance it merited by patients, family members or health personnel.

Abortion is a sensitive subject in Malaysia, as it is in most countries Although private medical practitioners are allowed to perform abortions if the mental or

physical health of a mother is at risk, pregnancy termination is uncommon and unsafe abortions are not a significant factor in maternal mortality.

In the present investigation it emerged that few women at risk because of medical conditions were offered pre-conception contraceptive counseling or early termination of pregnancy. Health professionals sometimes failed to recognize obvious medical conditions, and inappropriate or late intervention took place in certain cases. Because the risk of death would have been diminished in some patients had there been collaboration between physicians and obstetricians it is recommended that combined management be adopted for patients with such conditions.

The high proportion of maternal mortality with which substandard care, now called remediable factors, was associated, demonstrates that it is vital not only to gather information on the standard of care but also to make it widely available, and various activities have been undertaken in order to achieve this. The confidential reports have been circulated to all institutions and organizations providing maternity care, and to medical schools, postgraduate trainees and midwifery schools. Articles and case histories have been published in the newsletter of the national medical association. Many new protocols and procedures have been developed and established, and essential equipment has been purchased for use in certain health facilities. Regional seminars have been organized on the investigation system and the dissemination of its findings, and training modules have been distributed to all involved in the provision of maternity care.

The enquiry has shown that a comprehensive and confidential analysis of maternal death is feasible, and that remedial measures can be found. The National Technical Committee is auditing the implementation of the recommendations that have been made.