Perinatal mortality — an intervention study

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Summary

Perinatal mortality is high in rural hospitals in South Africa. In part this is due to less than optimal care. This study determined the perinatal mortality experienced by a rural hospital and its clinics. Avoidable causes of death are described and various intervention strategies that effectively and rapidly prevented such deaths, reducing perinatal mortality by one-third, are outlined.

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Perinatal mortality is a useful measure of the socio-economic status of a community and the standard of obstetric care provided within the community. Much has been written about the causes of perinatal mortality and their importance in both the developed and the developing world.[1-4]

To rural health workers perinatal mortality rates are crucial because some of the factors that lead to perinatal death stem from less than optimal care.[5] These statistics can be used as a form of audit and attempts can be made to lower perinatal mortality by improving care.

Over a 3-month period in 1988 a pilot study was performed at Jane Furse Hospital, Lebowa, in which 640 consecutive hospital and clinic deliveries were analysed. Perinatal mortality was 60 per 1 000 total births (≥ 1 000 g). In 30% of the perinatal deaths basic errors or omissions in care had occurred. These included failure to perform antenatal blood tests, failure to react to abnormal results appropriately (50% of clinic midwives believed the VDRL test was for gonorrhoea and subsequently undertreated syphilis) and failure to refer patients with elevated blood pressure. Inappropriate per vaginam examinations were often carried out in patients with per vaginam bleeding or premature rupture of the membranes. Many of these deaths could be considered avoidable and are a target for prevention.

In 1989 a perinatal mortality intervention study was undertaken, with the aim of reducing perinatal mortality by eliminating these avoidable deaths through the introduction of a variety of intervention strategies.

Patients and methods

All perinatal deaths occurring over a 7-month period were analysed in detail, prospectively. In particular, a search was made for error or omission in management and their contribution to the perinatal death was considered.

Intervention strategies were introduced at the start of the study. The strategies were devised using information from the pilot study and from any further avoidable deaths that occurred during the intervention study.

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Results

During the study there were 2 193 consecutive hospital and clinic births among which 90 perinatal deaths occurred — a perinatal mortality rate of 41/1 000 total births (stillbirth rate 22/1 000).

This compares with a perinatal mortality rate of 60/1 000 in the pilot study. Perinatal mortality thus fell by almost one-third (Table I).

TABLE I. COMPARISON OF STUDIES

	Pilot study, 1988	1989 study		
Total births (≥ 1 000 g)	**640**	**2 193**	$\chi^2 = 3{,}877$, df = 1, $P < 0{,}05$	$\chi^2 = 9{,}30$, df = 1, $P < 0{,}005$
Perinatal deaths	**38**	**90**	$\chi^2 = 4{,}50$, df = 1, $P < 0{,}05$	
'Preventable' perinatal deaths	**11**	**12**		

The percentage of deaths considered avoidable over the study period was 13%. This compares with 30% during the pilot study. Chi-square comparison (of actual numbers) showed this fall to be highly significant ($P < 0{,}05$).

The 11 perinatal deaths considered avoidable are detailed in Table II.

TABLE II. DETAILS OF PERINATAL DEATHS

Case	Facility	Cause of perinatal death
1	**Clinic**	**Anaemia — Hb 5,20 g/dl untreated, stillbirth 3 wks later**
2	**Clinic**	**Anaemia — Hb 6,10 g/dl untreated, intra-uterine death 10 days later**
3	**Hospital**	**Cord prolapse — failure to perform caesarean section for footling breech at 4 cm dilatation**
4	**Hospital**	**Failed resuscitation — equipment missing**
5	**Clinic**	**Severe pre-eclampsia — not referred and died 2 days later**
6	**Clinic**	**Antenatal blood not taken — intra-uterine death, VDRL-positive, clinically congenital syphilis**
7	**Clinic**	**Antenatal blood not taken — intra-uterine death, VDRL-positive, clinically congenital syphilis**
8	**Hospital**	**Congenital syphilis — VDRL-positive treated as gonorrhoea. Intra-uterine death 1 mo. later**
9	**Clinic**	**Antenatal blood not taken — intra-uterine death, VDRL-positive, clinically congenital syphilis**
10	**Hospital**	**Asphyxia — slow delivery of head at caesarean section**
11	**Hospital**	**Severe pre-eclampsia — not reported during labour. Stillbirth**

Discussion

The pilot study performed in 1988 confirmed the high perinatal mortality rate experienced in a rural hospital such as Jane Furse. It also showed that fundamental flaws in basic midwifery and obstetric care contributed to much of the mortality. No specific intervention measures were undertaken at this stage, although in common with everyday clinical practice, mistakes were highlighted and discussed.

The concept of avoidability is important and it may be impossible to know if the absence of an avoidable factor will prevent a particular death.[5,6] In this study the reasonable assumption was made that receiving antenatal care is better than not receiving it,[7] and that such care should be correctly carried out.[8] It is deaths occurring in association with deviation from such care that are considered avoidable, although this is a subjective decision.

A number of intervention strategies were employed during the study period. A community obstetrics guide was developed, which contained simple, dogmatic guidelines on management and referral thresholds for clinic midwives to follow. This guide was introduced at training days for the midwives. Instructions on the correct management of anaemic and VDRL-positive patients were given, and a policy was initiated to admit all pre-eclamptic patients with a diastolic blood pressure of $\geqslant 100$ mmHg.

With the help of the hospital administration, a regular system of blood collection from and result delivery to the clinics was organised. This replaced the *ad hoc* and inefficient system previously in use, ensuring blood results could be acted upon within 2 weeks of booking. Abnormal results were thus acted upon swiftly and correctly.

Hospital-based midwives were given instruction in neonatal resuscitation (including the preparation of necessary equipment) and management of labour room emergencies (e.g. breech delivery and shoulder dystocia).

Although other variables, such as seasonal variation, medical staffing changes, everyday attempts to improve clinical practice, and comparison between a 3-month and a 7-month period must be considered as influencing the results described, the major influence seems to have been the introduction of specific intervention strategies with a subsequent reduction in the number of deaths associated with error or omission. This produced a fall in perinatal mortality of almost one-third.

Rural hospitals are busy and understaffed. Perinatal mortality audit as used here is an effective method of detecting easily preventable deaths and thus can be used to direct scarce time and manpower resources to maximum effect. Maintained over a year, the results achieved here prevent 76 perinatal deaths in this hospital (prevention of 19 deaths per 1 000 in 4 000 annual deliveries).

Conclusion

The contribution of suboptimal care to perinatal mortality is often not obvious to busy staff. Careful audit demonstrates the problems well and indicates areas for improvement. Intervention will reduce perinatal mortality and, reproduced country-wide, this could be a highly cost-effective method of reducing perinatal mortality.

REFERENCES

1. Bound JP, Butler NR, Spector HG. Classification and causes of perinatal mortality. *Br Med J* 1956; **2:** 1191-1196.
2. Barson AJ, Tasker N, Lieberman BA, Hillier VF. Impact of improved perinatal care on the causes of death. *Arch Dis Child* 1984; **59**: 199-207.
3. Rip MR, Keen CS, Kibel MA. A medical geography of perinatal mortality in Metropolitan Cape Town. *S Afr Med J* 1986; **70**: 399-403.
4. Rip MR, Keen CS, Woods DL. Births and perinatal deaths in Mitchell's Plain. *S Afr Med J* 1986; **70**: 827-830.
5. Macfarlane A. Perinatal mortality surveys. *Br Med J* 1984; **289**: 1473-1474.
6. Mersey Regional Working Party on Perinatal Mortality. Confidential enquiries into perinatal deaths in the Mersey region. *Lancet* 1982; **1**: 491-494.
7. Ross SM, Macpherson TA, Naeye RL, Khatree MHD, Wallace JA. Causes of fetal and neonatal mortality in a South African black community. *S Afr Med J* 1982; **61**: 905-908.
8. Beischer NA, Mackay EV. *Obstetrics and the Newborn: An Illustrated Textbook*. 2nd ed. London: Baillière Tindall, 1986: 46-62.