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The value of incorporating avoidable factors into perinatal audits

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Objective. To assess whether incorporating a system of identifying, classifying and grading avoidable factors into a perinatal audit can be useful in identifying problem areas.

Design. Descriptive study.

Setting. Black urban population, Pretoria, South Africa.

Subjects. All perinatal deaths of infants weighing more than 1 000 g from urban areas served by Kalafong Hospital between August 1991 and July 1992.

Methods. All perinatal deaths were classified according to the primary obstetric cause of death and neonatal cause of death, and whether any avoidable factors were present which could have contributed to the death.

Results. The perinatal mortality rate was 26/1 000 deliveries. Avoidable factors occurred in 58% of perinatal deaths. Our problem areas which were immediately remedial were identified as labour management-related problems, administrative problems in obtaining syphilis results, and estimation of fetal weight. Other problem areas which need to be solved are patient education, early attendance at clinics, improved documentation and continuing education of medical personnel.

Conclusion. The use of this classification of avoidable factors has enabled the detection of problem areas that can be improved immediately at very little cost.

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The perinatal mortality (PNM) rate of a region is an indirect measure of the socio-economic status of a population and the health care available. Improvement in the PNM in an area where the socio-economic status of the population has remained unchanged suggests improved medical care.

Counting the number of perinatal deaths and total number of deliveries enables the PNM to be determined. Furthermore, because disease patterns present in a population can be ascertained, more PNM information can be obtained and research priorities established. In pregnancy there are many disease processes which, if left unattended, would result in a perinatal death. This usually does not occur with appropriate patient-initiated actions, for example, the mother's coming to hospital, or medical intervention, for example, a caesarean section for obstructed labour. Allocation of only pathological causes to each death does not allow for investigation of the patient's and the medical personnel's response to the disease process. In many cases some of the factors that impact directly on the death of a baby are avoidable and related to the abovementioned responses. Unless these avoidable factors (or areas of missed opportunity for intervention) are identified and documented, further valuable information that can lead to improved perinatal care will be lost. Simply setting up PNM meetings and discussing the avoidable factors may also lead to a decreased PNM.[1]

This study was undertaken to assess, once the perinatal death had been *identified* and the primary obstetric *cause* designated, whether the incorporation of a system of identifying, classifying and grading *avoidable* factors into a perinatal audit could be useful in identifying problem areas in perinatal care. This could then facilitate the finding of *solutions* to the problems identified. We have called this the *'ICA Solution'* system of audit.

Subjects and methods

A descriptive study was performed in a black urban population from the Pretoria region. All perinatal deaths (188 singleton babies and 14 babies from multiple pregnancies) of infants weighing more than 1 000 g from this region were analysed between August 1991 and July 1992. All perinatal deaths were classified according to the primary obstetric and neonatal causes of death.[2] Potentially avoidable factors, which could have contributed to the death, were identified, classified and graded.

The avoidable factors were classified into patient-orientated, administrative and medical management-related groups. The patient-orientated category was further divided into an inappropriate response to a complication, for example, staying at home after rupture of the membranes, non- or late attendance at antenatal clinics, and criminal intervention in the pregnancy.

Administrative-related factors were defined as problems which were administrative in nature, for example, lack of an ambulance to transport an ill patient.

The medical management category was further divided into honest errors, oversight and gross deviation from accepted practice. Honest errors were deemed to have been made in situations where the attendant acted correctly according to the information available or the clinical findings, but where the information or finding on which the management was based was incorrect. Over- and underestimation of fetal weight are examples of this. Oversights were cases where an abnormal finding was present at the time of the relevant examination but was overlooked or not acted upon at the time of the examination. An example of this is failure to respond appropriately to the presence of glycosuria at an antenatal visit. Gross deviations from accepted practice were present in cases where a potentially dangerous and inappropriate procedure was carried out on a patient, for example, the use of forceps when more than two-fifths of the fetal skull was above the brim of the pelvis.

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Avoidable factors were classified into two grades: grade 1 — actions which, if avoided or altered, could *possibly* have modified the outcome, and grade 2 — actions which, if avoided would *probably* have altered the outcome, in which case the baby might have survived.

Perinatal death meetings were used to discuss all deaths and to allocate causes and avoidable factors. To ensure confidentiality and more objective analysis, all means of patient identification and that of the management personnel were removed. All the cases were presented by a doctor who was specifically assigned the task of presentation, to allow the problem to be discussed freely. Final categorisation of avoidable factors was made by one researcher (RCP) after assessment of the case notes to ensure consistency.

Results

The PNM was 26/1 000 deliveries. The primary cause of death is shown in Table I and the final neonatal cause in Table II. The classification and grading of potentially avoidable factors are shown in Table III. In certain patients there was more than one avoidable factor, hence the apparent discrepancy in the data.

Table I. Primary obstetric cause of death

	Singleton pregnancy		Multiple pregnancy	
Cause	No.	%	No.	%
APH	38	18,8		
Unexplained IUD	36	17,8		
Spontaneous preterm labour	26	12,9	10	4,9
Intrapartum-related	24	11,9	2	0,5
Infections	20	9,9		
Fetal abnormalities	20	9,9		
Hypertensive disorders	17	8,4	2	1,0
Maternal disease	4	2,5		
IUGR	3	1,5	—	—
Sub-total	188	93,6	14	6,4

Total 202 deaths

IUD — intra-uterine death; APH — antepartum haemorrhage; IUGR — Intra-uterine growth retardation.

There were avoidable factors in 58% of patients with babies weighing more than 1 000 g, and grade 2 factors were present in 30,2% of cases. Grade 2 patient-orientated factors were present in 15,4%, medical management factors in 17,3% and administrative factors in 7,4% of perinatal deaths.

Honest errors occurred in 21% of avoidable medical management factors. All involved incorrect estimation of fetal weight. Oversight was responsible for 58% of avoidable medical management factors and gross deviations from accepted practice for 21%. The most common administrative problem was failure to obtain the syphilis serology result (40%). The main patient-orientated factor was non-attendance for antenatal care (60%). Delay in reporting the rupture of membranes was the most common inappropriate patient response (26%).

Table II. Final neonatal cause of death

Cause	No.	%
Prematurity-related		
Extreme multi-organ immaturity	11	13,9
Hyaline membrane disease	11	13,9
NEC	5	6,4
Pulmonary haemorrhage	2	2,5
Asphyxia and birth trauma		
Asphyxia	17	21,5
Meconium aspiration	5	6,4
Persistent fetal circulation	1	1,2
Trauma	1	1,2
Infection		
Septicaemia	8	10,2
Pneumonia	5	6,4
Congenital syphilis	2	2,5
HIV+	1	1,2
Congenital abnormalities	8	10,2
Unknown	2	2,5
Total	79	100

NEC — Necrotising enterocolitis.
Total perinatal deaths — 202; neonatal deaths — 79 (39,1%); Unexplained stillbirths — 123 (60,9%).

Table III. Classification and grading of avoidable factors

Classification	Grade 1	Grade 2
Patient-orientated	31	31
Inappropriate response	12	11
Non/late attendance	19	18
Criminal intervention	–	2
Administrative	6	15
Medical management	22	35
Honest error	5	7
Oversight	15	18
Gross deviation from accepted practice	2	10

Intrapartum complications were responsible for 11,9% of perinatal deaths and 70% of these had grade 2 avoidable medical management factors. The most common problem was incorrect use of the partogram followed by inappropriate use of assisted delivery. Syphilis was responsible for 8,9% of deaths, and all patients had grade 2 avoidable factors. The most common avoidable factors here were non-attendance at antenatal clinics (56%) and administrative delays in getting results back (39%).

Discussion

In half of the primary causes of perinatal death, namely abruptio placentae, intra-uterine death of unknown origin and congenital abnormalities, no clear aetiological factors or prevention methods are known. In another area, spontaneous preterm labour and hypertensive diseases, the aetiological factors are becoming clearer but useful preventative strategies remain elusive. This leaves a few common causes of perinatal death which are usually clearly avoidable, namely intrapartum factors and infective causes. To have an immediate impact on the PNM and at little cost, these factors need to be identified and steps taken to rectify the situation. By auditing the PNM using avoidable factors

as described above, our problem areas which are immediately remedial were identified, e.g. labour management-related problems, administrative problems related to obtaining syphilis results and estimation of fetal weight. Other problem areas are patient education, early attendance at clinics, improved documentation and continuing education of medical personnel.

During the audit the following interventions took place immediately. Identification of administrative problems in obtaining syphilis serology results led to on-site syphilis screening with the rapid plasma reagin test and the immediate treatment of women who tested positive.[3] Intensive in-service training in the use of the partogram commenced. Registrars were trained in sonar estimation of the fetal weight and this was introduced in all cases where symphysis measurements were less than 29 cm.[4] The midwives in the area decided to adopt the Perinatal Education Programme as their in-service training.[5] Other problems such as early attendance at antenatal clinics and inadequate documentation are being addressed.

The use of this system of classification of avoidable factors has enabled the detection of problem areas that can be improved immediately and at very little cost. For ease of use, this system of audit has been computerised and called the Perinatal Problem Identification Programme (PPIP). Further information is available from Dr Pattinson.

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