Perinatal mortality rates in isolated general practitioner maternity units

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Abstract

Objective—**To determine the perinatal mortality rate among normally formed, singleton babies with birth weights ≥2500 g in Bath health district based on the intended place of delivery at the time of onset of labour or at the time of diagnosis of intrauterine death.**

Design—**The numbers of live births and stillbirths were collected by monthly returns from the maternity units concerned. Deaths of infants aged ≤1 week were collected in the same returns. The intended place of delivery was confirmed at the monthly perinatal mortality meeting, during which maternal and fetal factors were discussed.**

Setting—**A rural health district of 400 000 population where one third of all deliveries occurred in seven isolated general practitioner maternity units, 8% in the integrated general practitioner unit, and the remainder in the consultant unit.**

Subjects—**All babies of women whose deliveries were booked in the district before the onset of labour or the diagnosis of intrauterine death, excluding twins, babies with lethal congenital malformations, and those <2500 g.**

Main outcome measures—**Outcome of all deliveries and parity of mothers.**

Results—**14 415 Deliveries were analysed. The perinatal mortality rate was 2·8/1000 births in the consultant unit (7950 deliveries), 4·8 in the isolated general practitioner units (5237 deliveries), and zero in the integrated general practitioner unit (1228 deliveries). Perinatal deaths attributable to asphyxia were more common in the isolated general practitioner units (1·5 per 1000) than the consultant unit (0·6 per 1000). The perinatal mortality rate among babies born to nulliparous women was 3·2/1000 births in the consultant unit and 5·7 in the isolated general practitioner units; for those born to multigravid women it was 2·4 and 4·2 respectively.**

Conclusions—**The outcome of delivery was not influenced by parity. Both antenatal and intrapartum care were responsible for the higher perinatal mortality rate in the isolated general practitioner units. The integrated unit, which shared midwifery staff with the consultant unit, seemed to work well. Analysis by intended place of delivery at the time of onset of labour or diagnosis of intrauterine death suggested that the care given in isolated units needs to be improved, perhaps by better training of general practitioners and consultant supervision of antenatal care.**

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Introduction

There have recently been many changes in maternity services, with a shift from a high proportion of births taking place at home to a high proportion taking place in hospital. General practitioner obstetrics has consequently changed, and in 1982 only 4% of deliveries in England and Wales were in isolated general practitioner maternity units.[1]

Several studies have attempted to determine the safety of general practitioner obstetric care, analysing isolated units[2] and integrated units[3,4]; some studies have been retrospective,[5] and many have reported necessarily on small numbers of deliveries. A study of home births in England and Wales in 1979 was unable to take into account those women transferred to hospital during labour.[6] Arguments about general practitioner obstetrics have at times been heated, and many extrapolations have been made from the data. Perhaps the only safe conclusions are that no individual delivery is low risk except in retrospect and that nulliparous women have a much higher risk with planned home deliveries than parous women.[6]

Most of these points have been discussed in Bath health district, which, unusually, has one integrated and seven isolated general practitioner units in which roughly one third of all deliveries take place each year. In the areas covered by the isolated general practitioner units roughly half the women deliver in these units. In 1984 we began a prospective study of the perinatal mortality rate in the district to audit the performance of the maternity services. The method of analysis of the mortality data was discussed by the district maternity advisory committee and agreed before the study.

District policy advised that women in whom intrauterine fetal death had occurred should be transferred to the consultant unit. Thus analysis of the perinatal mortality rate by place of delivery before 1984 suggested a low rate in the general practitioner units and a high rate in the consultant unit. The consultant unit should not be attributable for intrauterine fetal deaths occurring among women transferred there. Similarly, satisfactory transfer of booking from a general practitioner unit to the consultant unit during pregnancy because of a newly found risk factor is a feature of successful care; and the outcome should be attributed to the unit accepting the transfer. Thus we based the perinatal mortality rate on the intended place of delivery at the onset of labour or at the time of the diagnosis of an intrauterine death if this occurred before the onset of labour. The unit for which the delivery was initially booked was not considered important.

POPULATION AND RESOURCES

Bath health district has a population of 400 000 and covers west Wiltshire, north east Somerset, and part of the county of Avon; 300 000 people live in rural areas or county towns outside Bath. The seven isolated general practitioner units are situated in these peripheral areas and have a total of 80 beds (range five to 26). One of the units was closed for 12 months during the study because of a lack of trained midwifery staff. Four of the units had antenatal clinics served by the four consultant obstetricians, but in two units problem patients were seen locally only as required; one unit had no local antenatal clinic.

The consultant unit is based at the district general hospital and has 66 maternity beds for antenatal and postnatal women, which are also shared by the local general practitioners. These general practitioners work with the same midwifery staff except in "domino" deliveries, when the community midwife attends in hospital. There are 10 labour rooms and a dedicated

obstetric operating theatre. The special care baby unit is alongside the labour ward. A flying squad is available to the isolated general practitioner units from the consultant unit in Bath, and obstetric, paediatric, and anaesthetic services can be summoned when required using a dedicated telephone line. It takes 30 to 60 minutes to reach most units. It is district policy to deliver twins, preterm infants, and babies with malformations diagnosed in utero in the consultant unit.

Methods

The study ran from October 1984 to December 1987. At monthly perinatal mortality meetings a record was made of whether the woman had intended to deliver in the consultant unit, the integrated general practitioner unit, or one of the isolated general practitioner units when labour started or intrauterine death was diagnosed if occurring before the onset of labour. The cause of infant death was analysed and possible preventable factors discussed. Results of necropsy, usually performed by one experienced pathologist, were available in most cases. Maternal and fetal factors were classified with the 1986 classification.[7,8]

Each month the isolated general practitioner units sent details of the number of deliveries performed and the number of women transferred in labour. They recorded the number of babies who had had a birth weight <2500 g. Similar figures were available for the integrated general practitioner unit. These figures were cross checked against the record of deliveries in the district general hospital, which noted whether a woman was under the care of a consultant, under the care of a general practitioner using the integrated unit, or transferred from an isolated unit.

Because intrauterine fetal deaths among women transferred in labour were attributed to the unit in which the women started labour, all other transfers in labour, including those with a successful outcome, were also attributed to the unit in which the mother started labour.

The consultant unit, the isolated general practitioner units, and the integrated unit were compared by χ^2 tests with a 3×2 contingency table.

TABLE I—*Perinatal mortality rate/1000 births according to parity of mother and intended place of delivery at onset of labour or diagnosis of intrauterine death*

	No of births	No of perinatal deaths	Perinatal mortality rate (95% confidence interval)
Consultant unit:			
Nulliparous	3740	12	3·2 (1·4 to 5·0)
Multigravid	4210	10	2·4 (0·9 to 3·9)
All	7950	22	2·8 (1·6 to 4·0)
Isolated general practitioner unit:			
Nulliparous	1928	11	5·7 (2·3 to 9·1)
Multigravid	3309	14	4·2 (2·0 to 6·4)
All	5237	25	4·8 (2·9 to 6·7)
Integrated general practitioner unit:			
Nulliparous	502		0 (0 to 5·9)
Multigravid	726		0 (0 to 4·1)
All	1228		0 (0 to 2·4)

Results

During the study there were 15 465 deliveries excluding home deliveries, those from concealed pregnancies, and those that had been booked outside the district. Of these, 8817 were booked in the consultant unit at the onset of labour or at diagnosis of intrauterine death, 5373 in an isolated general practitioner unit, and 1275 in the integrated general practitioner unit.

There were 133 perinatal deaths: 86 attributed to the consultant unit, 41 to an isolated general practitioner unit, and six to the integrated general practitioner unit, giving perinatal mortality rates of 9·8, 7·6, and 4·7 per 1000 births respectively. When twins, babies with lethal congenital malformations, and low birthweight babies (<2500 g) were excluded from the analysis, however, 47 perinatal deaths occurred from 14 415 deliveries (table I). The perinatal mortality rate for normally formed, singleton babies with birth weights ≥2500 g was 2·8/1000 births in the consultant unit, 4·8 in the isolated general practitioner units, and zero in the integrated general practitioner unit ($\chi^2=8·3$, df=2; $0·001<p<0·025$).

Table I also shows the results analysed by parity. The analysis showed that the higher perinatal mortality rate in the isolated general practitioner units was equally high for both nulliparous and multigravid women.

The maternal and fetal factors were classified separately (table II). Fourteen babies died during labour or after delivery of asphyxia in labour. Six of these deaths were attributed to the consultant unit (death rate of 0·6 per 1000 births (one due to antepartum asphyxia)), and eight to the isolated general practitioner units (1·5 per 1000 births).

TABLE II—*Maternal and fetal factors (numbers of deaths) causing perinatal death of the 47 normally formed singleton babies weighing ≥2500 g at birth*

Maternal factors	Fetal factors	Comments
	Deaths attributed to consultant unit (n=22)	
Unexplained (12)	Antepartum asphyxia (9)	1 Refused induction (intrauterine death at 48 weeks) 1 Decreased fetal movement 1 True knot in cord 1 Cord tight around neck
	Intrapartum asphyxia (3)	1 Long labour
Other maternal disease (3)	Antepartum asphyxia (3)	All diabetic
Antepartum haemorrhage with abuprtion (2)	Antepartum asphyxia (2)	1 Intrauterine death 1 Death from meconium aspiration
Rhesus hydrops (1)	Isoimmunisation (1)	No ultrasound monitoring
Mechanical vertex (1)	Intrapartum asphyxia (1)	
Mechanical breech (1)	Intrapartum asphyxia (1)	
Unclassifiable (1)	Unexpected infant death syndrome (1)	
Maternal hypertension (1)	Antepartum asphyxia (1)	
	Deaths attributed to isolated general practitioner units (n=25)	
Unexplained (15)	Antepartum asphyxia (10)	3 Mothers did not use kick chart
	Intrapartum asphyxia (5)	1 Death after transfer
Antepartum haemorrhage with abruption (4)	Antepartum asphyxia (3)	
	Intrapartum asphyxia (1)	
Other maternal disease (2)	Antepartum asphyxia (2)	Both women developed gestational diabetes
Antepartum haemorrhage of uncertain origin (1)	Intrapartum asphyxia (1)	Mother had raised blood pressure
Pre-eclamptic toxaemia without antepartum haemorrhage (1)	Antepartum asphyxia (1)	
Mechanical vertex (1)	Birth trauma (1)	Tentorial tear
Mechanical breech (1)	Intrapartum asphyxia (1)	

Discussion

With the planned delivery of preterm infants, twins, and babies known to have abnormalities in the consultant unit it was not surprising to find the crude perinatal mortality rate highest in this unit. The exclusion of all such deliveries shows the underlying risk for healthy, normally formed singleton babies. It is inappropriate for the adjusted perinatal mortality rate to be higher in the isolated general practitioner units than the consultant unit, which was taking the high risk deliveries, and our finding that the rate in the isolated units was almost double that in the consultant unit is alarming and requires explanation. Elective caesarean sections usually have a low perinatal mortality rate, but as only 4·7% of deliveries in the consultant unit were elective caesarean sections this cannot explain the whole difference.

Where and when did these excess deaths occur? Only one baby died after transfer to the consultant unit during labour (dying within five minutes of arrival), which is perhaps a surprisingly low death rate. None of the isolated general practitioner units had an appreciably higher or lower death rate than any other, though this was not analysed statistically because of the small number of deliveries in some units. There was an excess of fetal deaths during labour among babies delivered in the isolated general practitioner units, suggesting that intrapartum care in these units was partly at fault. This analysis shows the importance of including in the figures of general practitioner units those intrauterine fetal deaths occurring in women who had intended to deliver in the isolated units but were transferred to the consultant unit solely because of the death. It is also important to compare results with those from a similar group within the consultant unit.

The low perinatal mortality rate of the integrated unit, though based on fewer deliveries, suggests that general practitioner obstetrics can safely be practised in such units. That general practitioners work with the same midwifery staff as consultants and have easy access to specialist services is thought to be important, and, in addition, most women delivering in the integrated unit were seen during pregnancy by a consultant obstetrician at least once, which was not possible for many of the women delivering in the isolated units.

The population we studied was much larger than that in previous studies. The study of home births in England and Wales showed high perinatal mortality rate for planned home deliveries among nulliparous women.[6] Nulliparous women delivering in the isolated general practitioner units do not seem to have caused the units' higher perinatal mortality rate, but such women have more difficulties and are more likely to be transferred in labour. Many nulliparous women are delivered in the isolated units—indeed, the current policy of the district health authority states that unless there is an obstetric indication other than being nulliparous the woman has to deliver in her local general practitioner unit.

Many labours were induced in the isolated general practitioner units despite suggestions that this is an inappropriate activity for general practitioner accouchement.[9] Induction of labour was recently stopped in general practitioner units. Fetal heart monitoring during labour has become available in some units, which can therefore hardly claim to be low tech. The question remains whether delivery in general practitioner units has any appreciable advantage for the fetus over a home delivery. All doctors giving perinatal care in the health district unit agree that locally based antenatal and postnatal care is needed, but opinion is divided over intrapartum care.

As skilled anaesthetic and paediatric services can be quickly available only in the consultant unit it could be said that all deliveries should take place in that unit, with transfer back to the isolated units for care shortly after delivery. All general practitioner obstetricians should be skilled in neonatal resuscitation, and despite regular lectures on resuscitation given locally this remains a problem. Even in 1990 a doctor can be on the obstetric list without having done an obstetric house job. Surely it should not be possible to practise intrapartum care without training in obstetrics as a senior house officer for six months and training in neonatal paediatrics. The Royal College of Obstetricians and Gynaecologists is not without blame, still believing that it is possible to learn adequate neonatal skills as an obstetric senior house officer, even in units where all neonatal care and resuscitation are done by paediatricians. Half the general practitioner trainees in Wessex have done six months' obstetrics and six months' paediatrics. Is it too much to ask that only these general practitioners practise intrapartum care?

Much has been written about the psychological importance of a normal delivery in friendly surroundings, but the psychological effects of losing a baby, particularly if the death was preventable, are enormous and long lasting. A study of consumers' views of maternity services in Bath health district concluded that "the majority of mothers would prefer a delivery under general practitioner care where considerations of safety permit,"[10] but the fact that it is not as safe to book for an isolated general practitioner unit as for a consultant unit has not been publicised. The important characteristics, which consumers identified as continuity and personalised and small scale care, should be attainable even in a central unit. Even accessibility could be improved, by having peripheral antenatal clinics and transfer back to a general practitioner unit for care shortly after delivery.

The recent increase in the number of consultant obstetricians in Bath from four to five will allow all women in the district to be seen by a consultant at least once during pregnancy. This is expected to improve antenatal screening and selection. The district health authority is to consider issuing a contract to general practitioners practising obstetrics in health authority premises that will require them to practise within set guidelines. We hope to analyse the results again to see if the perinatal mortality rate has improved.

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