holds and families and predominantly affects children and teenagers.⁷⁻⁹ Spread by contact at school or by venereal contact probably plays an insignificant part. The high incidence among teenage girls could be due to greater contact with younger children in large families and the habit of holding hands.

Inadequate control in the family is the main cause of spread and treatment is often unsatisfactory for several reasons. There is commonly a delay during which the ubiquitous steroid creams are applied. Instructions for using antiscabietic lotion may be erroneous, misunderstood, or even ignored. This is often prescribed to be dabbed on to spots for an indefinite period. Even the most careful, however, forget to paint their soles, a common site for burrows; symptom-free members of the household refuse treatment; and benzyl benzoate stings young children so severely that its application is abandoned.

The best way to control a scabies epidemic is to ensure adequate treatment in affected households and to follow up contacts. The Sheffield Area Health Authority agreed in June 1975 to make scabies once more a notifiable disease.² Health visitors were briefed to check contacts as well as primary cases to ensure that they were cured, and since then there has been a

steady decline in cases referred to the skin department: 103 patients in 1975 and 69 in 1976. On the other hand, the number of notified cases remains remarkably constant (table IV), and age groups and the predominance of females are similar to our survey figures. This is disappointing, but at least in theory the present epidemic should be ending and a decline in numbers is to be expected in the 1980s.

We are grateful to Mrs A Day who carried out the contact tracing, Dr I B Sneddon, Dr S Bleehen, and medical staff of the skin department, Mrs Janet Gyte for the data processing, Dr C H Shaw, Medical Officer of Health for Sheffield at the time, and Dr S Wright, Management Information Unit, Sheffield Area Health Authority (Teaching). We also thank the Endowment Fund of the United Sheffield Board of Governors for its assistance.

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TABLE IV—*Scabies notifications: City of Sheffield Metropolitan District*

July-September 1975	..	..	..	..	..	..	..	..	157
October-December 1975	..	..	..	..	..	..	..	..	191
January-March 1976	..	..	..	..	..	..	..	..	188
April-June 1976	..	..	..	..	..	..	..	..	104
July-September 1976	..	..	..	..	..	..	..	..	101
October-December 1976	..	..	..	..	..	..	..	..	184
January-March 1977	..	..	..	..	..	..	..	..	158

For Debate . . .

Intended place of delivery and perinatal outcome

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Summary and conclusions

Data from the "1958 Perinatal Mortality Survey" have been analysed to assess differences in stillbirth and neonatal death rates according to the arrangements made for delivery. Only women aged 20-34 delivering at term, with no pregnancy abnormalities, were selected from three groups of women (normotensive primiparae, hypertensive primiparae, and normotensive women of parity 1, 2, or 3).

Despite the fact that within each group the women booked for NHS consultant units were heavily weighted

with adverse factors, the death rate of their infants was no more than 70% of that found among the women booked for either domiciliary, general practitioner unit, or private consultant delivery. Care and delivery in a NHS consultant unit carries least risk of death for the infant.

Introduction

As women have become more independent they have started to question the concept of hospital delivery for all. The comfort, both physical and psychological, of delivery in the familiar surroundings of one's home cannot be compared with the harsh lights and sterilised bustle of most hospital deliveries.

It became obvious during a recent debate at the Royal Society of Medicine that there were few valid statistics to support the belief, firmly held by many obstetricians, that hospital delivery was much safer for the infant. The only recent attempt to look at the subject¹ had shown that the stillbirth rate in hospital deliveries was some three times that in domiciliary deliveries.

This type of analysis, however, is too crude and naive for valid interpretation. Not only are data on place of delivery

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confounded by emergency transfers, but any woman thought to be at high risk of perinatal loss is much more likely to be booked for hospital delivery.

Hobbs and Acheson² analysed data on 5791 deliveries of primiparae in Oxfordshire during 1962-4. They showed that the perinatal death rate in those booked for delivery in a consultant unit was, at 19 per 1000, slightly less than those booked for general practitioner care (20 per 1000). They pointed out that the women booked for a consultant unit were a high-risk group with an excess of women of low social class, aged 30 and over or under 20, and having a history of previous miscarriage. They concluded that all primiparae should be booked for consultant care. They did not, however, assess the optimum type of care for multiparae, nor did they try to determine whether there was any difference between booking for home or GP maternity unit delivery.

The domiciliary delivery rate has fallen dramatically in the past 20 years and now fewer than 4% of babies in Britain are delivered at home. To obtain enough data for valid comparison we have therefore used data collected almost 20 years ago, when the rate of domiciliary confinement was 35%.

Methods

The 1958 *British Perinatal Mortality Survey*^{3,4} consisted of two slightly overlapping studies. The first, the control-week study, covered all deliveries (including stillbirths) in England, Scotland, and Wales in the first week of March 1958. Detailed questionnaires on the socioeconomic background, maternal conditions, course of pregnancy, type of delivery, and condition of the baby were completed for over 98% of deliveries.

The second part of the survey concerned all stillbirths and neonatal deaths occurring during March, April, and May 1958 in England, Scotland, and Wales. Similarly designed questionnaires were completed and further information on the infant and, where possible, a detailed post-mortem report were included. In all, some 95% of perinatal and late neonatal deaths were covered.

In our study we considered only women aged 20-34, delivered at term (37-41 weeks completed gestation as measured from the start of the last menstrual period), with no history of bleeding or of any non-obstetric abnormality present during pregnancy, whether chronic disease (asthma, heart disease, diabetes, urinary infection, epilepsy, etc) or more acute disorders (pneumonia, influenza, rubella, appendicectomy, etc).

We omitted from this group all women of parity 4 or more, those who had had a previous stillbirth or neonatal death or liveborn baby of low birth weight (under 2500 g), and those who had had previous toxæmia, antepartum haemorrhage, or delivery by caesarean section. From the remainder we selected three groups: (A) primiparae who had remained normotensive throughout—that is, with diastolic blood pressure below 90 mm Hg and no proteinuria (1628 cases); (B) primiparae who were not normotensive throughout (1067 cases); and (C) women of parity 1, 2, or 3 who were normotensive throughout (2402 cases).

We omitted from the deaths occurring in March, April, and May all those due to major congenital defect and Rhesus isoimmunisation. Three groups were then selected according to the criteria for (A), (B), and (C). The numbers of deaths in each category were 196, 220, and 171 respectively.

Stillbirth was defined as the birth of a dead fetus after a gestation of 28 weeks or more, and neonatal death as the death of a liveborn baby within 28 days of delivery. Social class categories were based on the occupation of the husband.⁵ Parity was taken as the number of previous pregnancies exceeding 27 weeks' gestation or resulting in a livebirth.

Death rates are expressed per 1000 total births. They have been calculated as the number of stillbirths and neonatal deaths in the three-month deaths divided by 12 times the control-week population.⁴ A multiplication factor of 13, which represented the differing periods over which the deaths and births were collected, was suggested but subsequently altered to 12 for the following reasons. Firstly, a higher proportion of all births occurring from 3 to 9 March 1958 was available to the survey (98%) than of all deaths occurring in the three months (94%). Furthermore, it was unlikely that the control-week births exactly represented births during the longer period covered by the deaths. The multiplier that was chosen, 12, gave close agreement

between the perinatal death rate calculated from the survey data and the official rate at the time. This procedure naturally does not ensure that the multiplier is equally correct for all subdivisions of the survey material.

Results

Death rates by place of delivery (table I) could be interpreted as showing that for groups B and C the safest place for delivery was in the patient's home. This, however, ignores the fact that if the midwife or general practitioner realised, either during labour or beforehand, that something was wrong the patient would be rapidly transferred to the nearest hospital.

Analysis according to whether the mother had been booked for domiciliary confinement or not (table II) showed that booking for NHS hospital delivery was associated with a consistently lower death rate ($P < 0.001$) than booking for domiciliary or some other type of confinement. The differences between booking for domiciliary care, private care, or delivery in a general practitioner unit were marginal.

Increased rates of stillbirth and neonatal death are associated with short stature, low maternal weight, smoking in pregnancy, previous abortion, low social class, and residence in certain areas of the

TABLE I—Death rates by place of delivery. Numbers of stillbirths and neonatal deaths are shown in parentheses

Place of delivery	Group A	Group B	Group C
NHS hospital	8.7 (95)	18.3 (156)	7.8 (60)
Home	10.6 (45)	13.3 (22)	5.2 (89)
GP unit	11.7 (43)	17.1 (37)	5.1 (16)
Private ward or nursing home	17.5 (12)	9.0 (4)	5.1 (5)
Total (including other)	10.0 (196)	17.2 (220)	5.9 (171)

TABLE II—Death rates by place of booking. Numbers of stillbirths and neonatal deaths are shown in parentheses

Place of booking	Group A	Group B	Group C
NHS hospital	7.7 (81)	14.5 (105)	4.4 (32)
Home	12.7 (58)	20.9 (54)	6.6 (114)
GP unit	11.5 (43)	20.0 (49)	6.2 (19)
Private ward or nursing home	15.0 (11)	21.9 (10)	5.8 (6)
Total (including other and none)	10.0 (196)	17.2 (220)	5.9 (171)

TABLE III—Death rate by various factors (all pregnancies)

	Death rate	
	Factor present	Factor absent
History of previous abortion	49.8	32.9
Pre-pregnant weight under 51 kg	37.3	35.0
Height under 157 cm	40.3	31.0
Social classes IV and V	40.8	33.4
Smoker	43.6	30.8
Residence in high risk area*	38.9	33.2

*Scotland, Wales, and North-west England.

TABLE IV—Percentage distribution of various factors that might affect outcome by place of booking (normotensive primiparae)

Variable	Place of booking		
	NHS hospital (n = 875)	Domiciliary (n = 380)	Other (n = 373)
History of previous abortion	7.7	4.7	7.0
Pre-pregnant weight <51 kg	23.9	14.2	13.4
Maternal height <157 cm	23.8	16.6	17.7
Social classes IV and V	18.5	15.2	15.0
Smokers	43.5	41.0	27.9
Residence in high risk area*	28.3	20.8	14.2

*Scotland, Wales, and North-west England.

country. Mortality rates according to each of these factors are shown in table III.

For group A, those booked for NHS hospital delivery were heavily biased with women falling into each of these high-risk categories (table IV). The results were similar for women in groups B and C. Thus the women booked for NHS hospital delivery should, by these criteria, have had a substantially higher perinatal death rate than those booked elsewhere.

TABLE V—Percentage distribution of various factors concerning labour and delivery by place of booking (normotensive primiparae)

Variable	Place of booking		
	NHS hospital	Domiciliary	Other
Length first stage < 24 h ..	14.9	14.6	14.6
Length second stage > 2 h ..	8.3	17.5	13.0
Membrane rupture < 24 h ..	8.1	6.9	11.6
Induction ..	4.5	2.1	4.6
Caesarean section ..	0.3	1.1	0.5
Breech delivery ..	1.0	0.3	0.8
Forceps to vertex ..	7.3	3.9	5.9

Table V shows how, in general, the management of labour and delivery varied with place of booking. The only differences distinguishing women booked for an NHS hospital from others was that the former were less likely to have long second stages of labour and slightly more likely to have the infant delivered with the aid of forceps.

When analysed by time of death (table VI), the excess death rate among the group booked for domiciliary or other care is found for both macerated and fresh stillborn babies and for those dying early and late in the neonatal period.

Discussion

Our study was designed specifically to look at the contrasts in perinatal and late neonatal death rates in three homogeneous groups of women. Obviously we have not been able to control for those factors that are not quantifiable but are characterised by the term “clinical instinct.” Such women would be likely, however, to have hospital rather than domiciliary bookings. Certainly factors carrying high risks within each of the three groups, such as smoking and low social class, were more likely to result in hospital booking.

Marsh⁶ has shown that sustained interest and care by a general practitioner can result in remarkably low perinatal mortality. Probably, however, only the most dedicated GPs can afford the time and energy to emulate his standards. A recent study of a GP unit in Glasgow⁷ showed that the GP attended only 60% of deliveries, and the authors concluded that “when all the pressures of a general practice are considered, it is difficult for general practitioners to give the close supervision now essential in labour.” Further analysis of their data⁸ showed that during 1969-74 the perinatal death rate for patients booked for consultant care fell considerably while it actually rose for those pregnancies booked for general practitioner care.

We cannot explain our finding of a considerably lower rate of stillbirth and neonatal death among women booked for hospital delivery in any way other than that the care these women received had a beneficial effect on the outcome of the pregnancy.

Unfortunately this analysis refers to a period when the prac-

tice of obstetrics was very different from today. Nevertheless, management of antenatal care, labour, and delivery in domiciliary delivery have probably changed little in the past 20 years. The reduction in the overall perinatal death rate is probably due to procedures such as ultrasound scanning and fetal monitoring in labour—which are available in a consultant unit, where neonatal paediatricians are also accessible to rapidly resuscitate the severely asphyxiated neonate.

Finally, the overall stillbirth rate in England and Wales^{9 10} for the ten years 1965-74 (figure) shows that although the stillbirth rate has fallen dramatically overall, that among home deliveries has not. Although these data cannot be analysed

Stillbirth rate 1965-74 for home deliveries compared with all deliveries.

rigorously, they support our basic interpretation of the data—that care and delivery in a NHS consultant unit carries least risk of death for the fetus.

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TABLE VI—Death rates according to whether mother was booked for NHS hospital and time of death. Numbers of stillbirths and neonatal deaths are shown in parentheses

Time of death	Group A		Group B		Group C	
	Hospital booked	Other booked	Hospital booked	Other booked	Hospital booked	Other booked
Macerated stillbirth	2.48 (26)	3.10 (28)	4.96 (36)	7.03 (39)	0.76 (7)	1.55 (37)
Fresh stillbirth	2.57 (27)	4.54 (41)	5.24 (38)	7.03 (39)	1.52 (14)	1.88 (45)
1st week	2.10 (22)	3.87 (35)	3.72 (27)	4.15 (23)	0.82 (6)	1.91 (41)
2nd-4th week	0.57 (6)	1.33 (12)	0.55 (4)	2.53 (14)	0.68 (5)	0.74 (16)