

Management of labour in an isolated rural maternity hospital

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Abstract

Objectives—To evaluate the use of a maternity unit run by general practitioners and midwives, describing the outcome of labour in an unselected group of women and quantifying the contribution made by general practitioners.

Design—Retrospective population based review of obstetric patients who had access to an isolated rural maternity unit.

Setting—Rural area 120 km from a consultant maternity unit.

Subjects—997 consecutive women delivered between January 1987 and May 1991.

Main outcome measures—Mode of delivery and complications by place of booking and place of delivery; need for medical intervention and transfer.

Results—530 women (53%) were booked for delivery in the rural unit; this group had a caesarean section rate of 3.8% and an unplanned transfer rate of 12.8% to the consultant unit in labour. Of the 462 who delivered in the low risk unit, 25 (5%) required a forceps delivery; postnatal complications requiring emergency medical support occurred in a further 33 (7%).

Conclusions—Risk characterisation is possible, but medical support from general practitioners and obstetricians is required in almost a third of women at low risk for complications of delivery. Results of this study support the team approach to obstetric management but not the move towards isolated units without organised medical support.

Introduction

Many reports, both in the United Kingdom¹⁻⁵ and overseas,^{6,7} confirm the safety and acceptability of delivery managed by midwives and general practitioners in obstetric units attached or close to consultant units. Most represent the work of enthusiasts, whose results may be more favourable than if care was provided by a less selected group. Rates of forceps delivery and transfers in labour might be different if all general practitioners and midwives were obliged to work outside a consultant led environment. In one paper the policy of encouraging delivery in rural units resulted in less favourable outcomes than in a consultant unit,⁸ although subsequent correspondence illustrated the problems of interpretation of the original data.⁹

The publication of the report of the Expert Maternity Group, *Changing Childbirth*, has reopened this debate,¹⁰ and "woman centred" care will increase demand for deliveries to take place in or near the woman's home. A study from Nottingham recorded that many general practitioners were not willing to take on responsibility for deliveries;¹¹ this offers the prospect of deliveries being managed by midwives with reluctant general practitioners as support. Concerns centred on a lack of confidence in obstetric skills, allied to a training based on a model of obstetrics that is

geared to abnormality. The strain of an additional 24 hour commitment is a major disincentive.

Methods

The study used a geographically isolated population and included all the patients of a group of general practitioners in the area around the obstetric unit at Stranraer (Clenoch maternity unit), which is run by midwives and general practitioners. Women are referred to this unit from the 17 general practitioners who cover the town and the surrounding area, representing a pooled practice population of 21 000. All general practitioners take part in acute maternity care and all women from their practices are referred to the unit's consultant run antenatal clinic. Virtually no women from these practices are referred elsewhere. Although women from other isolated rural practices are delivered at the unit, these were not included in the study.

All women were seen at the antenatal clinic by one of two visiting consultants from the nearest consultant unit at Cresswell Hospital, Dumfries, 120 km away. They were booked at the general practitioner hospital and attended at least one more time during pregnancy. Other antenatal care is provided in the general practitioner's surgery. The place of delivery was decided on the basis of a consultant's risk analysis or the patient's preference. Two groups of midwives provided care: one was based in the community and attached to the general practices; the other was hospital based (this has since become integrated).

A nearby community hospital staffed by general practitioners, one of whom was a part time consultant anaesthetist, provided 24 hour laboratory cover including blood transfusion and 24 hour emergency anaesthetic cover. There was also a single handed general surgeon. Paediatric resuscitation was performed by general practitioners. Routine epidural analgesia was not available. In the event of an emergency the case was discussed with the on call consultant and a management plan agreed. All general practitioners were able to carry out resuscitation and set up intravenous infusions, and most were able to perform forceps deliveries. One had the MRCOG qualification and 12 the DRCOG.

The hospital records of all pregnant women, excluding those with terminations or miscarriages, under the care of the general practitioners using the unit, and who delivered between 1 January 1987 and 31 May 1991 were examined. For these women the expected hospital of delivery at the onset of labour, the outcome of the pregnancy, the place of delivery, the progress of labour, mode of delivery, and complications that occurred were recorded.

Results

A total of 997 women delivered during the study period. At the onset of labour 530 (53%) were booked

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for delivery in the rural unit; 462 (87% of those booked; 46% of the total) delivered successfully in the rural unit. Table 1 summarises the place and mode of delivery. The rate of spontaneous vertex delivery at the rural unit was 433/462 (94%). This included five deliveries outside hospital in which the women were not under a consultant's care at delivery (these are included in general practitioner figures); three of these occurred during transfer.

Of the 413 primiparous women, 201 (49%) had been booked for delivery in the rural unit and 164 (40%) were delivered there. One hundred sixty four of the 462 general practitioner deliveries (35%) and 249 of the 535 consultant deliveries (47%) were in primiparous women.

Of the 584 multiparous women, 329 (56%) had been booked for delivery in the rural unit and 298 (51%) were delivered there. Two hundred ninety eight of the 462 general practitioner deliveries (65%) and 285 of the 535 consultant deliveries (53%) were in multiparous women.

OPERATIVE DELIVERIES

The caesarean section rate for the group was 161/997 (16%); all but two took place at the consultant unit. There were 12 assisted breech deliveries, two at the general practitioner unit. There were 25 forceps deliveries (5%) at the rural unit; seven were low cavity and 18 midcavity. Only one was in a multiparous woman; at the consultant unit, of the 30 (6%) forceps deliveries, a quarter were in multiparous women. The two breech deliveries carried out by general practitioners were both in primiparous women in premature labour. In one of these cases transfer was attempted, but the ambulance had to return after only 8 km of the 120 km trip. The two caesarean sections performed at the general practitioner unit were performed in emergencies by consultants. The overall caesarean section rate in women in the low risk group who started labour in the rural unit was 3.6% (19/530). Of women booked to deliver in the rural unit, 35 of the 201 primiparous women (17%) had caesarean or forceps delivery, compared with four of the 329 multiparous women (1%).

TRANSFERS

The transfer rate in women booked to deliver at the general practitioner unit was 12.8% (68/530); this included 18% of primiparous women (37) and 9% of multiparous women (31). The commonest reason for transfer was delay in the first stage of labour (21 (31%) transfers; table 2). Of the unplanned transfers in labour, 17 women had caesarean sections (25% of all transfers) and one a forceps delivery; the remaining 50 had normal deliveries.

Sixty eight other women who were booked for consultant delivery required transfer by ambulance with midwife escort. Most of these women were considered to be in labour and represent the highest risk cases; they cause anxiety and have resource

Table 2—Reasons for transfer to consultant unit during labour. Values are numbers (percentages) of transfers

	Multiparous women (n=329)	Primiparous women (n=201)	Total
Delay in first stage of labour	5 (7)	16 (24)	21 (31)
Premature labour	8 (12)	4 (6)	12 (18)
Meconium staining	7 (10)	3 (4)	10 (15)
Hypertension	3 (4)	4 (6)	7 (10)
Fetal distress	3 (4)	4 (6)	7 (10)
Antepartum haemorrhage	2 (3)	1 (1)	3 (4)
Postmaturity	1 (1)	1 (1)	2 (3)
Diminished fetal movement	1 (1)	1 (1)	2 (3)
No reason stated	1 (1)	1 (1)	2 (3)
Prolonged rupture of membranes		1 (1)	1 (1)
Delay in second stage of labour		1 (1)	1 (1)

Table 3—Complications occurring at general practitioner and consultant maternity units

	GP unit	Consultant unit	Total
Low Apgar score	14	50	64
Postpartum haemorrhage	10	21	31
Retained placenta	9	5	14
Prematurity	4	19	33
Congenital anomaly	3	3	6
Compound presentation	2	1	3
Third degree tear	1	3	4
Perinatal death	1	1	2
Shoulder dystocia	1	1	2
Stillbirth	1	3	4

implications for the ambulance, midwife, and sometimes general practitioners. A further 32 women were transferred because of rupture of the membranes but were not in labour.

The perinatal mortality rate was 6/1000. There were four stillbirths and two perinatal deaths. One stillbirth was indicated by the sudden loss of fetal heartbeat in the second stage of labour in the general practitioner unit and was delivered by forceps.

Thirty three women who delivered in the rural unit (7% of the total) required immediate and urgent medical attention (table 3). These deliveries involved a stillbirth, a perinatal death, 10 postpartum haemorrhages, a shoulder dystocia, two compound presentations, and four premature births (two breech); a further 14 infants had Apgar scores of 4 or less (3% compared with 9% (50) in the consultant unit). Nine retained placentas, three congenital abnormalities, and a third degree tear complicated a further 13 deliveries, and there were postnatal transfers for various reasons in 15 women not mentioned above.

Of the 530 women booked to deliver in the rural unit, general practitioner intervention was required in 156 (30%): 68 transfers, 27 forceps and breech

Table 1—Mode of delivery at isolated rural maternity unit and referral unit

	GP/midwife run unit			Consultant run unit		
	Multiparous women (n=298)	Primiparous women (n=164)	Total (n=462)	Multiparous women (n=286)	Primiparous women (n=249)	Total (n=535)
Spontaneous vertex delivery (n=764)	292	136	428	187	149	336
Before arrival at unit (n=2)	1	1	2			
In transit (n=3)	3		3			
Low cavity forceps (n=14)	1	6	7	2	5	7
Mid cavity forceps (n=41)		18	18	5	18	23
Caesarean section (n=161)	1	1	2	86	73	159
Breech birth (n=12)		2	2	6	4	10

deliveries, 15 postnatal transfers, and the 46 complications. Of these, 70 (13% of all women booked for delivery in the rural unit) were managed without transferring them to consultant care: 25 forceps deliveries, the 33 urgent cases described above, nine retained placentas, one third degree tear, and two breech deliveries. In the absence of general practitioners, the transfer rate would have doubled (145 transfers; 27%).

DISCUSSION

The position in Stranraer, a unit run by midwives and general practitioners remote from consultant expertise, is common in rural Scotland¹² but less so in the rest of the United Kingdom. The unit deals with a substantial proportion (46%) of all deliveries taking place in a defined area. When general practitioners discuss maternity care, the main concerns rest with safety, competence, and workload implications.¹¹

SAFETY

These figures show that this unit has a high degree of safety, but the 120 km transfer journey (itself a risk to patients and staff) complicates management.¹³ The value of accessible services is illustrated by the numbers of complications dealt with. In the absence of this unit all potential and actual complications would be transferred to a hospital, with a transfer time of two hours. Deliveries in transit would be common, and the resource implications for midwife escorts and ambulances are potentially colossal.

None of the transfers in labour developed serious problems due to delay. All problems such as forceps delivery, postpartum haemorrhage, low Apgar score, and retained placenta were dealt with adequately in the general practitioner unit.

COMPETENCE

The success of the unit rests on sound case selection. The number of perinatal deaths is too small to draw any meaningful conclusions. The rate of operative deliveries (forceps and caesarean) in the general practitioner unit was 5.8%, compared with 35.3% in the consultant unit and 26.5% in transferred women. The differences were entirely due to the number of caesarean sections, most of which were not performed during active labour. The almost fourfold increase in low Apgar scores in the group referred to a specialist also reflects effective case selection. If intervention is a risk marker then the women at highest risk had been referred antenatally rather than being unexpectedly transferred in labour. This may reflect good selection or unnecessary transfers. In the Wormerveer study (which excluded women booked to consultant care), the perinatal mortality rate was highest in those transferred in labour; the authors interpreted this finding to support the notion of good selection rather than an unacceptable risk to the transferred group.¹⁴ Perinatal mortality does not equate with intervention, but our figures support the effective selection of transfers by general practitioners. Primiparous women are at increased risk of operative delivery—17% compared to 1% of multiparous women booked to deliver in the rural unit.

WORKLOAD OF GENERAL PRACTITIONERS

During the 52 months of the study each of the 17 doctors averaged three confinements every two months. Twenty five forceps deliveries occurred during this time, meaning that an average general practitioner would carry out one forceps delivery every three years. Low Apgar score, postpartum haemorrhage, and shoulder dystocia could not be referred to the consultant unit and were dealt with in the rural unit; all of these complications remain well within the ability of a

trained general practitioner. The women needing forceps delivery or caesarean section or with retained placenta or third degree tears could all have been transferred, particularly in a less remote setting, but avoiding the 25 forceps deliveries would greatly increase the transfer rate. The rate of caesarean sections in labour was low—3.6%—suggesting that concerns about urgent operative deliveries have been overstated.

The need for resuscitation of babies with low Apgar scores, simple forceps deliveries, and control of postpartum haemorrhage arose in 49 deliveries (11% of all the women delivering at the rural unit)—general practitioners who undertake such care should be equipped to carry out these procedures. The minimum range of skills that general practitioners require are establishment of intravenous infusions, bimanual uterine compression, and emergency resuscitation of babies. These can now be demonstrated on artificial models, and protocols can be formulated for their management.¹⁵

Changing Childbirth acknowledged the contribution that general practitioners can make, but it foresees a service run by midwives supported by specialist staff.¹⁰ Our study documents the benefits that suitably trained general practitioners can offer to women in labour. Two studies have reported experience of units run without support from general practitioners. In one only a quarter of all women delivered in the unit, and the transfer rate in labour was 18%.¹⁶ In the other study, in a selected group the transfer rate was 30% before and 16% during labour.¹⁷ The involvement of general practitioners may reduce rates of transfer to consultant care.

Comparisons with experience from other general practitioner units are difficult because each unit or system works according to its own history and local needs. Marsh's general practitioner unit delivered a larger proportion of pregnant women but had a higher forceps delivery rate (9%).⁵ The general practitioner unit in Oxford reported that general practitioners undertook delivery of 61% of the pregnant women in their care,¹⁸ but a separate study from the same centre showed their selection, since only 15% of all deliveries took place under general practitioner care.¹⁹

Our study strongly reinforces the case for units run by midwives and general practitioners, many of which have evolved over decades to provide a safe, acceptable, and efficient model of care. In rural areas the discouragement of general practitioner obstetrics will increase transfer rates and may increase the risk in labour to fetus, mother, and attending staff.

The involvement of general practitioners is valued by women^{10,20} and increases the chance of delivery in a

Key messages

- Less than half of women in a mainly rural health district were able to be delivered in the low risk setting of a unit run by general practitioners and midwives
- Intervention and complication rates were considerable (30%), although caesarean section in active labour was rare
- Complications were primarily postpartum haemorrhage and low Apgar score; these were all dealt with at the general practitioner unit
- Involvement of general practitioners is valued by women and improves safety in isolated units; the key element in success is an enthusiastic motivated medical community

familiar environment. It improves safety in isolated units. The key elements in achieving such success are an enthusiastic motivated medical community, with general practitioners, midwives, and consultants developing in an atmosphere of generous cooperation. Continuity of care is highly valued by women and can only be enhanced by the involvement of the patient's general practitioner at all stages of pregnancy.

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Correction

Measles and rubella misdiagnosed in infants as exanthem subitum (roseola infantum)

An error occurred in the title of this article by Tait *et al* (13 January, pp 101-2). It should read "Exanthem subitum (roseola infantum) misdiagnosed as measles or rubella," not as given above.

Advice to authors

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