

National census of availability of neonatal intensive care

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Abstract

Objective To determine whether availability of neonatal intensive care cots is a problem in any or all parts of the United Kingdom.

Design Three month census from 1 April to 30 June 1999 comprising simple data sheets on transfers out of tertiary units.

Setting The 37 largest high risk perinatal centres in the United Kingdom.

Participants One obstetric specialist and one neonatal specialist in each centre.

Main outcome measures Suboptimal care resulting directly from pressure on service—that is, transfers out of tertiary units (either in utero or after delivery) because the unit was “full” and not because the hospital was incapable of providing the care needed.

Results All units provided data. The number of intensive care cots in each unit was between five and 16. During the three months 309 transfers occurred (equivalent to 1236 per year), of which 264 were in utero and 45 postnatal. Sixty five in utero transfers involved multiple births, hence the census related to 382 babies (1528 per year). There was considerable regional variation. The reason for transfer in most cases was “lack of neonatal beds”.

Conclusions Currently most major perinatal centres in the United Kingdom are regularly unable to meet in-house demand; this has implications for the service as a whole. The NHS has set no standards to help health authorities and primary care groups develop services relating to this specialty; such a step may well be an appropriate lever for change.

Introduction

High risk obstetrics and neonatal intensive care are high cost, low volume specialties. As a result health planners around the world have taken the view that specialist perinatal services should be organised to make maximum use of the resources available.^{1 2} Implicit in such a policy is a decision to maintain high levels of average occupancy and to accept that some mothers or infants, or both, will need to be transferred from one unit to another. Attempts to measure demand for neonatal intensive care have been few,³⁻⁶ and, in the United Kingdom, no national or regional plan to match supply and demand has been in place for at least 10 years.⁷ Recently there has been

increasing concern among professionals in the United Kingdom that shortages, of neonatal intensive care beds in particular, have changed the situation from one of “efficient use of resources” to one of crisis management. There has also been considerable media attention in relation to some of the individual cases.⁸ Anecdotal reports of what is undoubtedly poor quality care from the family’s perspective (for example, long distance transfers, sending newborn siblings to different hospitals, multiple moves), however, are difficult to put into perspective in a service in which some transfers are an accepted norm.

The Clinical Standards Advisory Group (CSAG) commented on this topic and identified two types of transfer that were unequivocally not good practice.¹ They stated that mothers and infants should not be forced to travel beyond their nearest referral centre (or centres if they are more or less equidistant) and that tertiary centres should not transfer out their own high risk mothers and infants.

We wanted to use these definitions as a means of quantifying the national picture in relation to perinatal services. The first category posed difficulties, however, as measuring such transfers accurately would have required the cooperation of every perinatal service in the country (estimated to be about 250⁹). The avoidance of double counting, as infants moved from one unit to another, represented a further complication encountered in previous studies.¹⁰ Assessment of the situation in the tertiary centres seemed much more feasible as the number of units was known to be far less (about 40). In addition, such transfers were likely to occur only when absolutely no alternative existed and were thus likely to be well documented and widely discussed within the unit, making them easy to identify. We therefore carried out a three month census of transfers out of the United Kingdom’s major perinatal centres as a measure of how well demand for high risk perinatal care was being met without breaking the good practice guidelines of the Clinical Standards Advisory Group.

Methods

Twenty two obstetricians and neonatologists representing the English regions, Scotland, Wales, and Northern Ireland were asked to select the tertiary perinatal centres in the United Kingdom. A research nurse employed by the study then identified a senior

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obstetrician or midwife and a senior neonatologist or neonatal nurse within each of these hospitals. These individuals were asked to report all in utero and postnatal transfers out between 1 April and 30 June 1999 of women and or babies previously accepted for care at that hospital. Transfers of mothers and infants requiring specialist care not available in that unit and planned transfers back to the hospital of booking of babies who had received intensive care were not included. Data recorded included basic information about the condition of the mother and baby as well as the reason for the transfer. At the end of the study period the clinical contacts in each hospital were sent a copy of their data and were asked to confirm that the information was correct.

Results

Thirty seven tertiary perinatal centres were identified; 34 were based in teaching hospitals. The average (range) number of intensive care cots per unit was 8.9 (5-16). In the three months of the study, 309 transfers (equivalent to 1236 in a 12 month period) were reported. These comprised 264 in utero transfers and 45 postnatal transfers. Of the in utero transfers, 65 involved multiple births, representing 138 babies. Therefore the total number of babies recorded by the census was 382 (equivalent to 1528 in a 12 month period). Among the 45 postnatal transfers were four sets of multiple births that could not be accommodated in a single hospital. Mothers and babies leaving perinatal centres were sometimes sent to other tertiary units, but others found space in district general hospitals.

Data relating to in utero transfers identified lack of space on the neonatal unit as the main factor precipitating the transfer in 245 of the 264 cases. Of the postnatal transfers, 43 out of 45 were specifically because of a lack of available neonatal cots. Data from the neonatal units (not available for in utero transfers) indicated that on nine occasions it was shortage of staff that was the primary problem rather than a lack of space per se.

The table shows summary data on the pattern of transfers in different parts of the United Kingdom. The areas are described in terms of the old UK regions, but some have been combined to reflect the administrative approach taken by the census. Rates have been calculated with the 1995 birth totals, the last year for which these were published in relation to the old regional structure. Variation in the ability of the major centres to cope with demand is clearly shown between different parts of the United Kingdom. It is important to note, however, that this variation results from many factors including, in particular, the attitude to provision of neonatal intensive care taken in the past (that is, centralised versus decentralised).

Discussion

This study was initiated in response to concerns that hospitals caring for high risk pregnancies and deliveries in the United Kingdom were at times under excessive pressure, causing the normal organisational structure for perinatal care to break down. The intention was to test the validity of these concerns by

Geographical distribution of inappropriate transfers around United Kingdom over three month period. Localities are described in terms of old NHS regional structure

| Region | Total transfers* | Rate per 1000 live births (95% CI) |
|----------------------------------|------------------|------------------------------------|
| Northern and Yorkshire | 36 | 1.80 (1.30 to 2.50) |
| Trent | 51 | 3.52 (2.68 to 4.63) |
| Anglia | 4 | 0.48 (0.18 to 1.28) |
| Oxford | 19 | 2.24 (1.43 to 3.51) |
| North East and North West Thames | 35 | 1.44 (1.03 to 2.01) |
| South East and South West Thames | 20 | 0.92 (0.59 to 1.43) |
| South and West | 49 | 5.16 (3.90 to 6.83) |
| Wessex | 14 | 1.48 (0.88 to 2.50) |
| West Midlands | 21 | 1.24 (0.81 to 1.90) |
| North West and Mersey | 4 | 0.20 (0.08 to 0.53) |
| Wales | 45 | 5.24 (3.91 to 7.02) |
| Scotland | 11 | 0.77 (0.43 to 1.39) |
| Northern Ireland | 0 | |

*In utero transfers of multiple births counted as single transfer.

assessing the situation in one part of the service, the largest perinatal centres in the United Kingdom. Adequacy of the service was measured against existing national recommendations regarding good practice. We found that breaches of these recommendations were commonplace. We have no reason to believe that the time period chosen was unrepresentative, though a longer study would be appropriate to confirm that the geographical variation is genuine. We had no concerns about the level of cooperation provided by the units concerned and believe that the results, in terms of the numbers of mothers and babies, are an accurate reflection of the service during the study period. The organisational structure in some parts of the country, especially Northern Ireland, where there is only one large neonatal unit, meant that transfer out of the perinatal centre could not always occur even when it would have been desirable to alleviate an excessive workload.

Implications of results

The survey identifies a shortfall in neonatal intensive care cots as the main problem faced by the service. It is important that the term "neonatal intensive care cot" is understood to mean not just a bed space but also the equipment and staff that allow the space to be utilised for intensive care. Lack of staff was mentioned as a specific factor resulting in unavailability of a cot on relatively few occasions. The design of the data sheets meant that staff could indicate that the neonatal unit was full without identifying if this reflected lack of staff; as a result the importance of this issue may have been underestimated.

The study was focused on referral units because this allowed us to define and measure an aspect of the service that was undeniably poor quality care from the patient's perspective. The situation in district general hospitals, where most deliveries in the United Kingdom take place, was not measured. When these hospitals want to transfer mothers or infants, because their unit is full or the case is complex, they will normally seek space in the referral units involved in this study and hence will often face great difficulty in finding a cot.

Although families rarely, if ever, welcome the prospect of being transferred simply because the local unit

is full rather than to access a specialised service, it is legitimate to ask whether such moves have an actual impact on outcome. There has been much debate about this issue, but the most recent information from the United Kingdom, with data from transfers in which good practice rules had generally not been broken, suggests that survival is not jeopardised,¹¹ but the effects on long term outcome have not been assessed. The psychological and financial burdens placed on families involved in any type of transfer are without doubt considerable.¹²

Is the situation changing, or has this study simply documented a longstanding problem? There are no national data to answer this question directly, but anecdotally the number of long distance transfers and reports of newborn siblings sent to different hospitals are increasing. Regional surveys support this view, with data showing steadily increasing demand in the face of static provision.¹³

Possibilities for change

The study raises several questions. Is the current situation acceptable? At present the neonatal services of the United Kingdom cope with demand by running at high levels of occupancy and, when necessary, transferring mothers and infants to wherever a cot exists, often at short notice and often a long distance from home. Such transfers are common. We measured this effect in large perinatal centres, but every delivery unit in the United Kingdom has similar difficulty from time to time. It is for the public and those responsible for health service strategy to decide whether this approach should continue given that we have no evidence that survival is affected. It is our view that the distress to families and staff caused by the present, uncontrolled, situation means that we should attempt to establish a greater degree of order.

How might change be achieved? Some aspects of the problem reflect those of the wider NHS (such as poor nurse recruitment and retention resulting in cot closures), but there are specific measures that could be put in place. Currently there are no national standards or targets set by the NHS that relate to this aspect of the health service, and across most of the United Kingdom there is no strategy for the provision of high risk perinatal care. Dealing with these two issues would lay the foundations for major change. Those purchasing services would then begin to look seriously at supply and demand for perinatal care in relation to the population they represent. This has not happened in a coordinated fashion for at least 10 years. In most cases this will mean maximising the potential of the local unit (district general hospital or teaching hospital) and then making provision with another hospital(s) convenient for the population to help with peaks of demand and the most complex cases. The frequency with which these arrangements break down could then be monitored at a local level and compared with national norms. Because of the nature of the service, transfers will always be part of obstetrics and neonatal intensive care, but the current, at times chaotic, situation can be avoided.

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What is already known on this topic

Anecdotal reports suggest that there are major difficulties in finding neonatal intensive care beds

What this study adds

Many of the major perinatal centres in the United Kingdom are not coping with in-house demand

The problem showed distinct geographical variation

These findings are probably part of a wider problem affecting all delivery units

ham; Rosie Maternity Hospital, Cambridge; John Radcliffe Hospital, Oxford; Chelsea Westminster Hospital, London; Hammer-smith Hospital, London; Queen Charlotte's Hospital, London; Homerton Hospital, London; The Royal London Hospital, London; St Mary's Hospital, London; University College Hospital, London; St George's Hospital, London; King's College Hospital, London; St Thomas' Hospital, London; Guys Hospital, London; Derriford Hospital, Plymouth; Southmead Hospital, Bristol; St Michael's Hospital, Bristol; Southampton General Hospital; Birmingham Women's Hospital; Birmingham Heartlands Hospital; City General Hospital, Stoke on Trent; St Mary's Hospital, Manchester; Liverpool Women's Hospital; University Hospital of Wales, Cardiff; Aberdeen Maternity Hospital; Ninewells Hospital and Medical School, Dundee; Simpson Maternity Memorial Pavilion, Edinburgh; The Queen Mother's Hospital, Glasgow; Glasgow Royal Maternity Hospital; Royal Maternity Hospital, Belfast.

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Competing interests: All of the authors and the sponsoring organisation are actively involved in perinatal medicine.

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Endpiece

Omens

The time's come: there's a terrific thundercloud upon us, a mighty storm is coming to freshen us up.

Chekhov