

## ORIGINAL ARTICLES

## Rate of Referral of Breech Infants for Hip Ultrasound: An Audit Cycle

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**ABSTRACT****Background**

Infants with risk factors for developmental dysplasia of the hip (DDH) should have hip ultrasounds performed shortly after birth to detect and treat the condition at an early stage. Breech presentation is associated with increased risk of DDH. We embarked on an audit cycle to assess and improve our rate of referral of breech infants for hip ultrasound.

**Methods**

Two retrospective audits (phases I & II) were carried out before, and after, the introduction of a new pro-forma which encouraged recognition of breech presentation at the time of the routine neonatal examination. Breech infants were identified from labour ward records. Multiple births and infants < 35 weeks gestation were excluded. Infants were considered to have been referred for ultrasound if the computer system at our affiliated children's hospital held a record of an ultrasound appointment.

**Results and Conclusions**

In phase I 56% of breech infants born in our hospital had been referred for hip ultrasound. In phase II the referral rate had risen to 76% ( $p = 0.034$ ). We conclude that the change in practice was effective. Further improvement might be achieved by increasing staff awareness of risk factors for DDH and by enlisting the help of advanced neonatal nurse practitioners (ANNPs) in routine neonatal examinations.

**Epidemiology**

Developmental dysplasia of the hip (DDH) is a multifactorial disease which affects 1.2 per 1000 live born infants in the UK<sup>1</sup> and is more prevalent amongst females. Risk factors include family history of DDH,<sup>2,3</sup> congenital postural abnormalities such as fixed talipes<sup>2,3</sup> and breech presentation<sup>2,3,4</sup> which is seen in approximately 3% of term deliveries.

DDH impairs growth and development of the hip joint and may result in abnormalities of gait and/or early onset osteoarthritis. It is widely accepted that early diagnosis improves outcome. The value of universal hip ultrasound as a screening programme for DDH remains uncertain.<sup>5</sup> Currently, in the UK, ultrasound is recommended only for infants with risk factors for DDH or clinically abnormal hips.<sup>1</sup> This approach has been proven to be effective in the early identification of DDH.<sup>6</sup>

**Setting**

This audit was conducted in an urban maternity unit delivering approximately 3000 infants per annum. The

paediatric department has close links with a nearby major children's hospital where all hip ultrasounds are performed.

**Methods**

Two separate retrospective audits were conducted. Phase I audited the six month period 1 July – 31 December 2002. Phase II audited the same period exactly two years later.

Singleton breech infants were identified using a record of delivery held by the labour ward. Multiple births were excluded because foetal presentations were poorly documented. Infants born prematurely below 35 weeks gestation were excluded because guidelines suggest that hip ultrasound is not indicated in this group.

Each infant born in our hospital has a routine neonatal check performed on day two of life. This is usually carried out by a paediatric Senior House Officer (SHO). Maternal case notes are reviewed and details of the pregnancy and delivery are recorded on a pre-printed pro-forma, along with the findings of the clinical examination of the infant. The pro-formas are reviewed by senior medical staff after the infant is discharged from hospital. At this stage, follow-up or referral to other specialties is arranged as indicated. If an infant has been identified as breech, he/she should be referred for hip ultrasound. In phase I, referrals were made by dictating a letter to the orthopaedics team at our nearby children's hospital. In phase II the system was slightly different; referrals were faxed directly to the radiology department at the children's hospital.

The information technology system at the children's hospital was used to check which infants had been appointed ultrasounds. Infants were searched for using name, date of birth, sex and address to avoid missing those whose surname had changed since discharge from the hospital of birth. Those with an appointment on the system (including those who had failed to attend) were counted as a positive referral from our hospital.

A change in practice was made after completion of phase I

with the aim of identifying and “labeling” (on paper) all breech infants at the time of the routine neonatal examination. New pro-formas were designed to incorporate two “tick-box” sections:

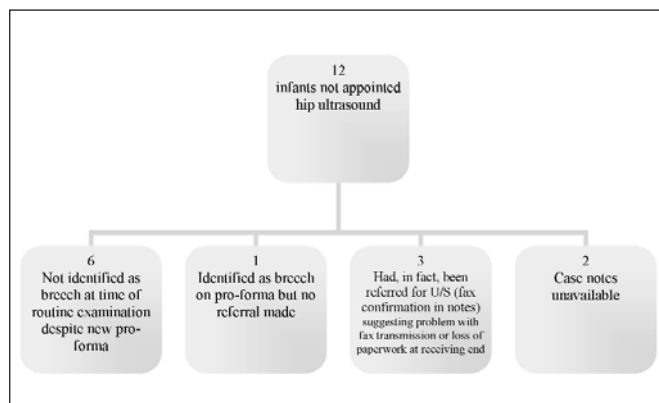
Delivery: Breech <input type="checkbox"/>	Vaginal <input type="checkbox"/>	Instrumental <input type="checkbox"/>
Caesarian <input type="checkbox"/>		
Breech after 35 weeks? <input type="checkbox"/>		

In phase II we reviewed the case notes of infants who had not been appointed an ultrasound in order to establish where the system had broken down.

## Results

Forty-three infants were included in phase I. Twenty-four (56%) were referred for ultrasound and nineteen (44%) were not. Fifty-one infants were included in phase II. Thirty-nine (76%) were referred for ultrasound and twelve (24%) were not. The increase in referral rate was found to be statistically

**Figure 1 Review of case notes of infants not appointed ultrasound in phase II**



significant ( $p = 0.034$ ) using the Chi-squared test. The findings of the case note review carried out in Phase 2 are presented in Figure 1.

## Discussion

Our audit cycle and its associated change in clinical practice has improved the rate of referral of breech infants for hip ultrasound in our hospital. At the outset nearly half of our breech infants were not referred. Now less than a quarter of breech infants fall in to this category.

We have taken care to ensure accuracy of results. Data was gathered retrospectively to avoid false increases in referrals as a consequence of staff awareness of ongoing prospective audit. Both phases of the audit cycle followed the same basic design in order to allow a fair comparison of results. One possible confounding variable is that, in phase II, ultrasound referrals were faxed rather than dictated and sent by post. It is conceivable that this *may* have had a positive influence on

referral rate, being a less time-consuming process. Of concern, three faxed referrals were “lost” in the system. Simple measures, such as displaying instructions for use of the fax machine, have been taken to minimise the chances of this problem recurring.

Ideally, 100% of breech infants should be referred for hip ultrasound and we must strive to achieve this. In audit phase II, despite the new pro-formas, 11% of breech infants were not identified and the importance of documenting breech/cephalic presentation must be emphasised to all staff. Referral rates could be improved by increasing staff awareness of DDH and the risk posed by breech presentation, perhaps by highlighting the issue at induction and unit teaching sessions. Some of our SHOs rotate every two months and may miss induction. This, compounded by hours restrictions makes teaching large groups difficult to organise. The development of a regularly updated clinical guideline booklet for all new medical staff may improve referral rates and we are working towards this. Finally, Advanced Neonatal Nurse Practitioners (ANNPs) can carry out routine neonatal examinations and may be more effective in detecting abnormalities than SHOs.<sup>7</sup> Further, they tend to work within one unit for an extended period of time, affording consistency in practice. We should consider enlisting the help of such professionals in our unit.

In conclusion, this is an example of a successful and productive audit cycle. Clinical practice in our unit has changed for the better. More cases of DDH will be detected at an early stage, resulting in earlier treatment and better long-term outcome. A strategy for further improving referral rate has been suggested and, as the audit cycle is a continuous process, we must ensure that these changes are implemented and their effect monitored.

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