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Assessment of fetal growth using customised growth charts:

NICE antenatal care guidelines vs Best Practice

This document presents the Perinatal Institute's response to the fetal growth section (Chapter 12) of the new NICE antenatal guideline and seeks to address the confusion which has been generated by these new guidelines.

The NICE recommendations

Two prominent recommendations in the 2007 *consultation guideline* [2] have since been dropped following evidence from stakeholders, including the Perinatal Institute's submission [3]. These were that

- a fundal height +/ 3cm from gestational age should be the trigger for further investigation, and
- customised charts should not be used

The recommendations in the revised Guidelines are now that

1. Symphysis-fundal height should be measured and recorded at each antenatal appointment from 24 weeks.
2. Ultrasound estimation of fetal size for suspected large-for-gestational-age unborn babies should not be undertaken in a low-risk population.
3. Routine Doppler ultrasound in low-risk pregnancies should not be used

We consider these recommendations to be incomplete, as there is no guidance as to how to undertake or interpret fundal height measurements, what constitutes normal growth and what triggers cause for concern needing referral.

Recommendations by the Perinatal Institute and the RCOG

The Perinatal Institute has established recommendations for best practice which are consistent with the 2002 RCOG Green Top Guidelines [4]. These have been written by an independent group of experts and have fully endorsed customised charts. Based on this recommendation, the Perinatal Institute has established an implementation programme. To date, staff from over 90 NHS maternity units in all NHS regions have been trained, and are using this method for fetal surveillance for about 200,000 expectant mothers each year. We recommend that:

1. Fundal height should be measured at each antenatal visit from 26 weeks gestation
2. The measurement should be plotted on customised growth charts adjusted for maternal height, weight in early pregnancy, parity and ethnic origin.
3. A fetal growth scan should be offered if the first fundal height measurement is below the 10th centile on the customised chart or serial measurements have shown a slowing of growth.
4. The results of the ultrasound biometry, expressed as estimated fetal weight (EFW), should be plotted

on the customised growth chart to assess relative size-for gestation, (or growth if a previous EFW has been plotted)
5. An EFW below the 10th centile on the customised chart, or slow EFW growth, is an indication for assessment of umbilical artery Doppler flow.

Clear guidance on fetal growth assessment is important because of the strong links between growth restriction and adverse perinatal outcome, and we know from systematic reviews that appropriate investigation of SGA babies reduces perinatal deaths [5].

By conventional methods, only about a third of SGA babies are detected antenatally. In a controlled study [6], measuring and plotting of fundal height on customised charts has been shown to significantly increase SGA detection while reducing unnecessary referrals for investigation. These results have since been confirmed by another study [7]. A recently completed confidential enquiry into stillbirths with fetal growth restriction has found that several deaths could have been potentially avoided if customised instead of population charts had been used [8].

Research

The NICE guidelines include a research recommendation to evaluate effectiveness. However the feasibility of proving such effectiveness in prospective studies, e.g. RCTs, is doubtful. Effectiveness is usually measured by 'hard' pregnancy outcome such as stillbirth. Analysis of a large database of stillbirths [9] showed that approximately 40% are associated with fetal growth restriction and about half occur at mature gestations allowing early delivery without increasing neonatal morbidity. A reduction of such deaths by half would require about **250,000** consenting mothers in each arm of the study. A more realistic (but still optimistic) reduction of IUGR related deaths by a third would require **560,000** mothers in each arm. In addition, such a study would have to assume that standard management protocols and practices are in place across the NHS once a growth problem is suspected - which is not the case. Some of these issues are well illustrated by the example of the 6-year multi-centre Growth Restriction Intervention Trial [10].

The Perinatal Institute believes that evidence for customised charts is already conclusive without an RCT, while there is little evidence to support the continued use of population charts for assessing fetal growth and weight. **We will continue to implement and support customised charts for surveillance of fetal growth in all units which wish to use them.** We have also established data collection to evaluate the effect of customised charts in practice, and will be pleased to support any unit who wishes to audit their own use of customised charts.

Concerns about quality and process

Quality issues were apparent as soon as the new guidelines were published for consultation. As a number of changes were required, we requested an additional round of consultation. This was denied, even though there is provision for this under Chapter 14 of the NICE Guidelines Manual [11] in cases of mis-interpreted evidence or omitted information, both of which circumstances were present. A number of flaws thus remain in the published final guideline.

The main concerns can be summarised as follows:

1. The GDG included no members with in-depth knowledge of fetal growth screening on its panel.
2. No experts were invited, even though other GDGs often invite special advisors to assist with deliberations.
3. The guideline misquotes customised charts in the introduction (p 272), stating that they 'take into consideration maternal characteristics such as height, country of family origin, cigarette smoking and diabetes'. In fact, as clearly described in the literature, customised charts present an 'optimal' standard which *excludes* pathological factors such as smoking and diabetes, and adjusts for constitutional variables such as maternal height booking weight, parity and ethnic origin.
4. A criterion was applied whereby the customised charts had to demonstrate their prospective

effectiveness, while the same is not expected of methods using population charts.

5. The GDG reviewed some but not other retrospective analyses. For example, a report from New Zealand [12] found that SGA determined by customised centiles were much more strongly associated with perinatal mortality, abnormal umbilical artery Doppler, caesarean section for fetal distress, low Apgar score, admission to the neonatal unit, high neonatal morbidity index, and prolonged stay.
6. The GDG failed to include a report from an NHS maternity unit with a multi-ethnic population which showed that use of customised charts in the NHS reduces unnecessary inductions and other interventions [13].
7. The GDG did not include, in section 12.2.6, evidence from a controlled study [6] which showed that FH measurement by customised charts significantly improve the detection of SGA, while reducing unnecessary investigations.
8. The GDG advocate fundal height measurement in their recommendation, while no mention is made how this should be performed, what represents normal, and what would constitute a trigger for further investigation.

The Perinatal Institute has written to NICE to highlight the concerns about the quality of the work which was carried out by this Guideline Development Group on behalf of the National Collaborating Centre. It has called for rigorous quality assurance in guideline development, the involvement of experts, and more than a single round of consultation to ensure that GDGs have sufficient support with the assessment and incorporation of evidence.

We welcome your comments - please send them to grow@pi.nhs.uk

References

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