Antenatal fetal monitoring

Written by Jennifer Davies, October 2004, updated following recommendation at an audit meeting March 2006, updated following publication of new CNST standards June 2009, updated August 2011 and February 2012

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Introduction

Antenatal fetal monitoring is a routine part of antenatal care in that fetal growth is assessed by palpation of uterine size (see also guideline for Measurement of Symphysis-Fundal Height Obs 107) and enquiries as to whether the baby is active assess fetal wellbeing. These take place at every antenatal check. In most pregnancies this is an adequate measure of fetal well being but on occasions when there is concern regarding a specific aspect of fetal wellbeing more detailed monitoring is necessary.

Indications

Situations which may require more detailed fetal monitoring include:

A. Maternal hypertension

Hypertension in pregnancy is not a single entity but comprises:

- Chronic (essential) hypertension which complicates 1 – 5 % of pregnancies and is defined as a blood pressure greater than 140/90 millimetres of mercury that either pre-dates pregnancy or develops before 20 weeks of gestation.
- Pregnancy induced hypertension which develops after 20 weeks of gestation and complicates 5 – 10% of pregnancies
- Pre-eclampsia which is pregnancy induced hypertension in association with proteinuria or oedema or both.

The types of hypertension in pregnancy differ primarily in the incidence and not the nature of maternal and perinatal complications. The UK Confidential Enquiries into Maternal Deaths has consistently shown an excess maternal mortality associated with hypertension in pregnancy due to intra-cerebral haemorrhage, eclampsia or end organ dysfunction.

Perinatal mortality and morbidity reflect both the fetal syndrome of pre-eclampsia (intra-uterine growth restriction) and the consequences of iatrogenic prematurity resulting from deteriorating maternal disease or fetal condition.

Treatment aims to improve both maternal and perinatal outcomes.

Additional fetal monitoring is required (see below)
B. Reduced fetal activity

The perception of fetal movement by an expectant mother is extremely variable. However, during the second half of pregnancy most women are aware of fetal movements and can appreciate when the frequency of movements reduces significantly. All women should be asked to pay attention to the frequency of fetal movements during the latter stages of pregnancy. This is however, particularly important where there has been an adverse outcome to a previous pregnancy or where there is a suspicion of intrauterine growth restriction in the present pregnancy. 55% of women experiencing a still birth had perceived a reduction of fetal movements prior to the diagnosis.

If a woman does not feel fetal movements and is more than 28 weeks gestation she should be advised to lie on her left side for 2 hours and if she has not felt 10 movements during those 2 hours to attend for further evaluation.

Patients with a significant reduction in fetal movements or absence of fetal movements should be advised to refer themselves for further monitoring immediately the reduction is recognised.

- to their own midwife during working hours
- to the delivery suite out of hours

Under 24 weeks

If the fetal heart beat is heard with a Doptone reassure unless fetal movements have never been felt in which case referral to exclude a fetal neuromuscular abnormality is advised

24 – 27 weeks

Confirm fetal heart beat present with Doptone (CTG is not indicated)

If there are risk factors for growth restriction, hypertension or stillbirth request ultrasound for growth and liquor

28+ weeks

Follow procedure below

C. Suspected small for gestational age (SGA) fetus

The absolute size of a baby at any given gestation is an unreliable indicator of health and well being. The nearer to term the greater is the natural variation in the size/weight of baby. Some will be constitutionally smaller or larger than average. Others may be of an average weight but not have reached the growth potential for that particular fetus. For these reasons the rate of growth is far more important than any one single measurement. A series of ultrasound measurements is therefore required which should be plotted on the charts in the antenatal notes. Deviation from the normal growth curve, particularly of the abdominal circumference may be an indication of fetal compromise.

Additional antenatal fetal monitoring (see below) is required if it has been identified that the uterine size may be small for gestation.
D. Previous stillbirth / neonatal death

Whether or not women are at increased risk of an adverse outcome will depend upon the cause of the previous stillbirth or neonatal death. Where extreme prematurity is implicated strategies to detect/prevent the onset of pre-term labour will be required. Where unexplained fetal loss has occurred late in pregnancy close monitoring (see below) and elective delivery before term are usually advised.

E. Post maturity

Patients where the pregnancy is still ongoing more than 2 weeks after the agreed due date but whose pregnancy is otherwise uncomplicated require additional fetal monitoring (see below). Reasons for this may include:

- Patient declines induction of labour
- No appointment slots are available for induction of labour
- Cervix is unfavourable and patient and obstetrician prefer to delay induction of labour.

If a baby is thought to be small, the CTG is suboptimal or the liquor is reduced, the patient should be encouraged to accept induction of labour.

Guidelines

Antenatal fetal monitoring is often planned in the antenatal clinic but is usually carried out on the antenatal day assessment unit and in the ultrasound department. Decisions to implement continued monitoring are usually made by a registrar or a consultant but a midwife may implement initial monitoring if she has concerns regarding fetal well being. Monitoring will be according to the procedure below in consultation with a registrar or consultant if any results are abnormal so as to plan further monitoring.

Procedure

<table>
<thead>
<tr>
<th>Action</th>
<th>Rationale</th>
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<tbody>
<tr>
<td>1. Document reason for increased fetal monitoring.</td>
<td>It is important to be aware of the reason for fetal monitoring in order to assess that the indication is still present.</td>
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<td>2. Check maternal blood pressure and test urine for protein (see Guideline Obs 99 Antenatal and postnatal management of hypertension)</td>
<td>Pre-eclampsia is a common underlying reason for fetal compromise.</td>
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<td>3.</td>
<td>Palpate the uterus to determine whether the fundal height is appropriate for gestation. Measure the symphysis-fundal height and plot on chart in antenatal hand held notes (see Guideline Obs 107). If the measurement shows no growth or slow growth suspect intrauterine growth restriction and follow the guidelines for this.</td>
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<td>4.</td>
<td>Perform a cardiotocograph (CTG) for at least 20 minutes. These should be performed and interpreted using the same criteria as intrapartum CTGs (see Guideline Obs 11 Intrapartum fetal monitoring). It is good practice to check in all cases that the fetal heart rate (FHR) agrees with the electronic fetal monitoring (EFM) by Pinard stethoscope and that it is not maternal heart rate that is being monitored by comparing with the mother’s pulse rate. The mother’s pulse rate and auscultated FHR should be written on the CTG at the beginning. If possible the computer assessed system should be used.</td>
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<td>5.</td>
<td>If monitoring is because of reduced fetal activity or for reassurance due to a previous adverse obstetric outcome and all investigations are normal the woman should be asked to report any continued or further reduction in fetal movements. Further appointments can be made as required for those requiring reassurance.</td>
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<td>6.</td>
<td>If a woman has presented twice within one week complaining of reduced fetal movements a scan for fetal biometry and liquor assessment should be arranged.</td>
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Antenatal fetal monitoring (Obs 21)
Latest date for review February 2015
7. If there is concern regarding fetal size or if there is significant maternal hypertension or proteinuria commence fortnightly ultrasound scans to determine estimated fetal weight (EFW) together with liquor volume evaluated by deepest pool. Plot EFW on customised chart in the hand held antenatal notes. Serial growth scans are fairly good at detecting poor fetal growth but there is no value in performing scans at intervals of less than 10 days. A low liquor volume is an indication for additional monitoring (RCOG 2002).

8. If the estimated fetal weight is below the 5th centile or increases more slowly than expected umbilical artery Doppler studies for umbilical artery end diastolic velocities (EDV) should be considered. Umbilical artery Doppler studies have a good negative predictive value for fetal compromise.

9. If EDV are present and the liquor volume is normal then a further Doppler study should be arranged in 2 weeks. The woman should be asked to report any reduction in fetal movements in the ensuing 2 weeks. Normal umbilical artery Doppler studies indicate that fortnightly monitoring of a small fetus will be adequate (RCOG 2002). Fetal movement monitoring may improve detection of fetal compromise.

10. A biophysical profile (BPP) should be considered if the Doppler studies are abnormal. These are time consuming and are rarely abnormal in the presence of normal umbilical artery Doppler studies. If the Doppler studies are abnormal a normal BPP has a good negative predictive value for fetal compromise.

11. If end diastolic velocities are reduced but present and liquor volume and BPP (including CTG) are normal outpatient monitoring can continue. Fetal movements should be monitored, CTG monitoring should be considered at a frequency to be decided by a senior clinician and a further Doppler study after one week together with a further liquor volume estimation. These are reassuring features.

12. If end diastolic velocities are absent (AEDV) or reversed (REDV), admit, give steroids if less than 36 weeks gestation, seek senior advise regarding further management. AEDV and REDV are pathological and indicate a very high risk situation needing high level monitoring and a readiness for immediate delivery.
References
RCOG Green Top Guideline No 31 (2002). The investigation and management of the small-for-gestational age fetus.

RCOG Green Top Guideline No 57 (2011) Reduced fetal movements


Process for audit
There are no specific audit criteria for this guideline but it will be audited as required dependent on clinical indications.