

# FETAL ASSESSMENT SYNTHESIS

## RESEARCH GAPS FROM COCHRANE REVIEWS (Cochrane Library Issue 1, 2010)

The faces indicate the direction of findings in each review:

- ☺ **Likely to be effective**
- ☹ **Both benefits and risks**
- ❓ **Uncertain or limited effect**
- ☹ **Likely to be ineffective or potentially harmful**

*Important research implications are more likely to arise from*

❓ *reviews with uncertain findings  
or where*

☹ *the risks and benefits are mixed.*

### Fetal assessment in pregnancy

#### ❓ **Antenatal cardiotocography for fetal assessment (Grivell 2010)**

*No clear evidence that antenatal CTG improves perinatal outcome.*

*Review content assessed as up-to-date: 30 September 2009.*

- Research on the effectiveness of traditional CTG should focus on women with specific conditions that pose risks to fetal health, such as post-term pregnancy, pregnancies with hypertension requiring 'day stay' assessment, or in women with decreased fetal movements or at increased risk of stillbirth.
- Need studies in both high-income and low-income countries
- Need to assess the use of CTG in combination with other tests of fetal well-being
- Need to urgently evaluate computerised CTG
- Recommend using minimum data sets (Devane 2007) to identify outcomes
- Clinical trials need to assess women's views and satisfaction with care (this will require good qualitative research methods).

#### ☹ **Biochemical tests of placental function (Neilson 2003)**

*A single small trial available does show benefit - but this question is probably of historical interest only since biochemical testing has been superseded by biophysical testing in antepartum fetal assessment.*

*Review content assessed as up-to-date: 1 November 2009.*

- Biochemical tests such as measurement of hormones are unlikely to be a major focus of research, although developments in laboratory techniques could stimulate further research in this area.

#### ❓ **Biophysical profile for fetal assessment in high-risk pregnancies (Lalor 2008)**

*Not enough evidence to support use of biophysical profile for assessing fetal well-being in high-risk pregnancies*

*Review content assessed as up-to-date: 8 November 2007.*

- Need trials of biophysical profile in high-risk pregnancies that measure obstetric intervention, length of hospitalisation, serious neonatal morbidity and parents' satisfaction
- Need a systematic review of methods to assess amniotic fluid volume, including the impact of measurement technique on obstetric interventions, such as caesarean section and induction of labour, and on infant outcomes such as Apgar score, acidosis and admission to NICU.

☺ **Fetal and umbilical Doppler ultrasound in high-risk pregnancies (Alfirevic 2010)**

*Doppler ultrasound in high-risk pregnancies reduced the risk of perinatal deaths and resulted in less obstetric interventions. The evidence was not of high quality, therefore results should be interpreted with some caution.*

*Review content assessed as up-to-date: 24 September 2009*

- Need clearer definitions of suspected placental insufficiency, frequency of Doppler studies and timing of delivery in the presence of abnormal Doppler studies
- Role of umbilical artery Doppler in other risk groups like post-term, diabetes and uncomplicated dichorionic twin pregnancy needs to be established
- Use of more sophisticated Doppler tests like assessment of blood flow in the middle cerebral artery and ductus venosus need to be assessed in rigorous clinical trials
- Could make a case for a large trial of Doppler ultrasound, particularly where the risk of fetal growth restriction caused by impaired placental blood flow is relatively low
- Need to use clinical outcomes from this Cochrane review as the minimum data set for future trials.
- Need to establish if fetal vessels other than the umbilical artery may be better markers of fetal well-being, fetal ductus venosus in particular

❓ **High feedback versus low feedback of routine prenatal ultrasound for improving outcomes (Nabham 2008)**

*Cochrane protocol, Cochrane review in progress.*

❓ **Regimens of fetal surveillance for impaired fetal growth (Grivell 2009)**

*Limited evidence from randomised controlled trials to inform best practice for fetal surveillance.*

*Review content assessed as up-to-date: 13 July 2008.*

- Need more trials to evaluate the effects of current fetal surveillance regimens for impaired fetal growth.

❓ **Fetal movement counting for assessment of fetal well-being (Mangesi 2007)**

*Not enough evidence on counting the baby's movements in the womb to check for wellbeing.*

*Review content assessed as up-to-date: 5 October 2006.*

- Need to determine the sensitivity and the specificity of fetal movement counting in detecting fetal compromise; its effectiveness in decreasing the perinatal mortality in high-risk and low-risk women; its acceptability to women; how easy it is for women; and the best fetal movement counting method

☹ **Pelvimetry for fetal cephalic presentations at or near term (Pattinson 1997)**

*Not enough evidence to support the use of x-ray pelvimetry in women whose fetuses have a cephalic presentation.*

*Review content assessed as up-to-date: 26 June 2007.*

- Need to define whether there are specific clinical situations, for example breech presentations, in which x-ray pelvimetry can be shown to be of value
- Newer methods of pelvimetry should be subjected to randomised trials to assess their value
- Further trials of x-ray pelvimetry in cephalic presentations would be of value if large enough to assess the effect on perinatal mortality

☺ **Routine ultrasound in late pregnancy (after 24 weeks gestation) (Bricker 2008)**

Routine late pregnancy ultrasound in low-risk or unselected populations does not show benefits for mothers or babies, and may increase caesarean rates.

*Review content assessed as up-to-date: 27 May 2008.*

- Further RCTs should assess the effects on both short and long term neonatal and childhood outcome and psychological effects (uncertainty, anxiety) of routine ultrasound in late pregnancy
- Future research of late pregnancy ultrasound should include placental assessment

? **Symphysis-fundal height measurement in pregnancy (Neilson 1998)**

*There is not enough evidence to evaluate the use of symphysis-fundal height measurements during antenatal care.*

*Review content assessed as up-to-date: 12 August 2002.*

- Requires a much larger trial than has been performed to date

? **Symphysial fundal height measurement (SFH) in pregnancy for detecting abnormal fetal growth (Protocol) Robert Peter (2009)**

Cochrane protocol, Cochrane review in progress.

☺ **Ultrasound for fetal assessment in early pregnancy (Neilson 1998)**

*Routine ultrasound examination was associated with earlier detection of multiple pregnancies and reduced rates of induction of labour for post-term pregnancy, but did not show differences substantive clinical outcomes such as perinatal mortality*

*Review content assessed as up-to-date: 27 June 2001.*

- Need larger RCTs of routine versus selective ultrasound which examine potential benefits of improved gestational age estimation
- Earlier detection of multiple pregnancies may allow better study of other, potentially useful, interventions
- Need more data about the value of detection of fetal malformations as part of routine ultrasound examination programmes
- Optimal timing of ultrasound could be addressed by a randomised controlled trial

? **Ultrasound for fetal assessment in early pregnancy (Whitworth 2008)**

Cochrane protocol, Cochrane review in progress.

## **Methods to facilitate tests of fetal wellbeing**

☹ **Fetal manipulation in conjunction with tests of fetal wellbeing (Tan 2001a)**

*Benefits of fetal manipulation have not yet been demonstrated in trials.*

*Review content assessed as up-to-date: 28 October 2007.*

- Not known if there are differences in outcome between different methods of manipulation

☺ **Fetal vibroacoustic stimulation for facilitation of tests of fetal wellbeing (Tan 2001b)**

*Vibroacoustic stimulation offers benefits by decreasing the incidence of non-reactive cardiotocography and reducing the testing time.*

*Review content assessed as up-to-date: 24 November 2003.*

- Further RCTs should investigate not only the optimum intensity, frequency, duration and position of the vibroacoustic stimulation, but also the efficacy, safety and perinatal outcome of these stimuli in conjunction with cardiotocography and other tests of fetal well-being
- These trials should be blinded, using mock stimulation, and outcomes such as fetal hearing impairment, loss of impaired neurological development, maternal satisfaction and maternal anxiety should also be assessed

? **Maternal glucose administration for facilitating tests of fetal wellbeing (Tan 2001c)**

*No benefits of glucose administration have yet been demonstrated in trials*

*Review content assessed as up-to-date: 30 May 2009.*

- Need further clinical trials on maternal glucose administration in conjunction with tests of fetal wellbeing and its effect on perinatal outcome.

## **Fetal monitoring during labour**

☺ **Continuous cardiotocography (CTG) as a form of electronic fetal monitoring (EFM) for fetal assessment during labour (Alfirevic 2006)**

*Continuous cardiotocography during labour is associated with a reduction in neonatal seizures, but no significant differences in cerebral palsy, infant mortality or other standard measures of neonatal well-being. However, continuous cardiotocography was associated with an increase in caesarean sections and instrumental vaginal births.*

*Review content assessed as up-to-date: 23 April 2006.*

- Need to further investigate causation and possible links between antenatal or intrapartum events, neonatal seizures and long-term neurodevelopmental outcome
- It may be possible to follow up babies in RCTs included in this review to see if seizure reduction leads to long-term benefits.
- Need to assess whether mobility and positions can reduce the already low incidence of neonatal seizures and improve psychological outcomes for women.

? **Effect of partogram use on outcomes for women in spontaneous labour at term (Lavender 2008)**

No evidence from this review that using a partogram reduced or increased caesarean section rates or had any effect on other aspects of care in labour.

*Review content assessed as up-to-date: 30 March 2008.*

- Need a large cluster-randomised trial to compare partogram versus no partogram
- Need to further explore the finding of significant differences in caesarean rates in low-income countries
- Need to stratify future trial participants according to parity, services with low (20 or less per 1000) and high perinatal mortality (more than 20) and low versus high intervention rates in the first stage of labour
- Need to assess women's views, ideally through mixed method approaches, including qualitative inquiry.

☺ **Fetal electrocardiogram (ECG) plus/versus other methods of fetal monitoring during labour (Neilson 2006)**

*Findings provide some support for the use of fetal ST waveform analysis when a decision has been made to undertake continuous electronic fetal heart rate monitoring during labour. However, the advantages need to be considered along with the disadvantages of needing to use an internal scalp electrode, after membrane rupture, for ECG waveform recordings.*

*Review content assessed as up-to-date: 16 April 2009.*

- Need more information about the value of fetal ECG waveform monitoring in preterm fetuses in labour
- Long term outcomes need to be measured

❓ **Fetal pulse oximetry for fetal assessment in labour (East 2007)**

*The data provide limited support for the use of fetal pulse oximetry when used in the presence of a nonreassuring CTG, to reduce caesarean section for nonreassuring fetal status.*

*Review content assessed as up-to-date: 29 November 2006.*

- Further trials using entry criteria related to the severity of nonreassuring CTG patterns may show greater effect.
- Need to assess long-term neurodevelopmental outcomes and issue of dystocia when a fetal pulse oximetry sensor is placed alongside the fetal head (possible use of scalp electrode).

❓ **Intrapartum fetal scalp lactate sampling for fetal assessment in the presence of a non-reassuring fetal heart rate trace (East 2006)**

*Cochrane protocol, Cochrane review in progress*

❓ **Near-infrared spectroscopy for fetal assessment during labour (Mozurkewich 2000)**

*No trials were located.*

*Review content assessed as up-to-date: 4 August 2009.*

- Should NIRS technology prove to be reliable, a well-designed RCT of near-infrared spectroscopy with other methods of fetal surveillance will be needed.

❓ **Vibroacoustic stimulation for fetal assessment in labour in the presence of a nonreassuring fetal heart rate trace (East 2005)**

*No trials were located.*

*Review content assessed as up-to-date: 30 January 2005.*

- Assessing long-term neurodevelopmental disability would be difficult to power without a prohibitively large sample size.
- Other relevant outcomes include the number of additional tests performed to assess fetal well-being following identification of a non-reassuring CTG, and operative birth rates.

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