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Is it better for a baby to be born immediately or to wait for labour to start spontaneously when waters break at or after 37 weeks?

Authors: Middleton P, Shepherd E, Flenady V, McBain RD, Crowther CA

What is the issue?

If a pregnant woman's waters break without onset of contractions (prelabour rupture of membranes – PROM) at 37 weeks of pregnancy or more, there are two options: the first is for induction of labour so that the baby is born as soon as possible (planned early birth); or secondly, to wait for labour to start naturally (expectant management).

Why is this important?

In a previous version of this review we found that planned early birth may reduce the risk of maternal infection without increasing the risk of caesarean section, compared with waiting. Fewer infants went to the neonatal intensive care unit with planned early birth, though there were no differences seen in rates of neonatal infection. While there are some benefits of early induction of labour, it is important to have a more complete picture of what happens with planned early birth compared with waiting for labour to start naturally.

What evidence did we find?

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This review included data from 23 randomised controlled trials involving 8615 pregnant women at 37 weeks of pregnancy or more. Only three trials were at overall low risk of bias, and the evidence in the review was very low to moderate quality. For planned early birth, 10 trials used intravenous oxytocin for induction of labour, 12 trials used prostaglandins, and one trial each assessed *Caulophyllum* and acupuncture.

The findings showed that planned early birth for PROM at term reduced the risk of infection for pregnant women (including infection of the membranes surrounding the baby and the amniotic fluid (known as chorioamnionitis)) compared with expectant management (eight trials, 6864 women; this was rated *low-quality evidence*), Planned early birth also reduced the risk of definite or possible infections for the babies (16 trials, 7314 babies, *low-quality evidence*). However, no differences were seen in the rates of caesarean births (23 trials, 8576 women, *low-quality evidence*), serious illness or death for the women (three trials, 425 women, *very low-quality evidence*), definite infection for the babies (six trials, 1303 babies, *very low-quality evidence*), or death for the babies (eight trials, 6392 babies, *moderate-quality evidence*). Babies born after planned early birth were less likely to be admitted to the intensive care unit (eight trials, 6179 babies), and both women (two trials, 748 women) and their babies (four trials, 5691 babies) had a shorter stay in hospital after planned early birth. Women had a more positive experience of planned early birth compared with expectant management (two trials, 5134 women).

What does this mean?

Planned early birth (compared with expectant management) after PROM at term may help to reduce infection for women without increasing the need for a caesarean section, and neonatal infection may also be reduced. However, evidence about longer-term effects on children is needed.

Dietary advice during pregnancy to prevent gestational diabetes

Authors: Tieu J, Shepherd E, Middleton P, Crowther CA

What is the issue?

Can dietary advice for pregnant women prevent the development of diabetes in pregnancy, known as gestational diabetes mellitus (GDM), which can cause health complications for women and their babies?

Why is this important?

Women with GDM have an increased risk of developing high blood pressure and protein in their urine during pregnancy (pre-eclampsia), and of having a caesarean section birth. Their babies may grow large and, as a result, be injured at birth, or cause injury to their mothers during birth. Additionally, there can be long-term health problems for women and their babies, including an increased risk of cardiovascular disease or type 2 diabetes. The number of women being diagnosed with GDM is increasing around the world, so finding simple and cost-effective ways to prevent women developing GDM is important.

Carbohydrates are the main nutrient affecting blood glucose after meals. The glycaemic index (GI) can be used to characterise the capability of carbohydrate-based foods to raise these levels. Some diets, for example, those with low-fibre and high-GI foods, can increase the risk of developing GDM. It has been suggested that dietary advice interventions in pregnancy may help to prevent women developing GDM.

What evidence did we find?

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We searched for studies on 3 January 2016, and included 11 randomised controlled trials involving 2786 pregnant women and their babies. The quality of the evidence was assessed as low or very low and the overall risk of bias of the trials was unclear to moderate. Six trials compared dietary advice with standard care, four compared advice focused on a low-GI diet with advice for a moderate- to high-GI diet, and one compared dietary advice focused on a high-fibre diet with standard advice.

There was a possible reduction in the development of GDM for women who received dietary advice versus standard care across five trials (1279 women, *very low-quality evidence*), though no clear difference for GDM was seen between women who received low- versus moderate- to high-GI diet advice across four trials (912 women, *low-quality evidence*). Two trials (282 women) reported no clear difference between women who received dietary advice versus standard care for pre-eclampsia (*low-quality evidence*), though fewer women who received dietary advice developed pregnancy-induced high blood pressure (*low-quality evidence*). There was no clear difference between the groups of women who received low-GI and moderate- to high-GI diet advice, in the number of babies born large-for-gestational age across three trials (777 babies, *very low-quality evidence*). Only one trial comparing dietary advice with standard care reported on the number of babies who died (either before birth or shortly afterwards), with no deaths in this trial.

There were no clear differences for most of the other outcomes assessed in the trials comparing dietary advice with standard care. including caesarean section, perineal trauma, and child skin-fold thickness at six months. However, women who received dietary advice gained less weight during their pregnancy across five trials (1336 women) (*low-quality evidence*).

Similarly, there were no clear differences for other outcomes assessed in the trials comparing low- and moderate- to high-GI diet advice, including for caesarean birth and weight gain in pregnancy. The trial comparing dietary advice focused on a high-fibre diet with standard advice found no clear differences for any outcomes.

The included trials did not report on a large number of outcomes listed in this review, including outcomes relating to longer-term health for the women and their babies (as children and adults), and the use and cost of health services.

What does this mean?

Dietary advice interventions for pregnant women may be able to prevent GDM. Based on current trials, however, conclusive evidence is not yet available to guide practice. Further large, well-designed, randomised controlled trials are required to assess the effects of dietary interventions in pregnancy for preventing GDM and improving other health outcomes for mothers and their babies in the short and long term. Five trials are ongoing, and four await classification (pending availability of more information) and will be considered in the next update of this review.

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Oral medication for the treatment of women with gestational diabetes

Authors: Brown J, Martis R, Hughes B, Rowan J, Crowther CA

What is the issue?

Globally the number of women being diagnosed with gestational diabetes mellitus (GDM) is increasing. GDM is an intolerance to glucose leading to high blood sugars, first recognised during pregnancy and usually resolving after birth. Standard care involves lifestyle advice on diet and exercise. Treatment for some women includes oral anti-diabetic medications, such as metformin and glibenclamide, which are an alternative to, or can be used alongside, insulin to control the blood sugar. This review aimed to investigate benefits of taking oral medication to treat GDM in pregnant women. Another Cochrane Review compares the effects of insulin with oral anti-diabetic pharmacological therapies *(* **Brown 2016**).

Why is this important?

Women diagnosed with GDM are at a greater risk of experiencing complications such as high blood pressure during pregnancy and at birth. They have an increased risk of developing diabetes later in life. The babies of women who have been diagnosed with GDM can be larger than normal and this can cause injuries to the mother and the baby at birth. The birth is more likely to be induced or the baby born by caesarean section. These babies are at risk of developing diabetes as children or young adults. Finding the best medications to treat the women and prevent the complications that are linked to GDM is therefore important.

What evidence did we find?

We searched for studies on 14 May 2016. We included 11 randomised controlled trials involving 1487 mothers and their babies (but only eight trials contributed data to our analyses). The evidence was limited by the quality and number of studies and we advise caution when looking at the results.

The criteria for diagnosis of GDM and treatment targets varied between studies, and each outcome is based on few studies with low numbers of women. Three studies compared oral medication with placebo/standard care but the following findings are from a single study (375 women). The quality of the evidence was very low or low. We found no differences between the oral medication and placebo group for the risk of high blood pressure, birth by caesarean section, induction of labour or perineal trauma. The number of babies born large-for-gestational age, with low blood sugars or dying at birth was not clearly different between the groups. Two studies (434 women) reported no difference in the need for insulin between the oral medication and placebo group.

Six studies compared metformin with glibenclamide. The quality of the evidence was very low to moderate. We found no difference between metformin and glibenclamide for the risk of high blood pressure (three studies, 508 women, moderate-quality evidence), birth by caesarean section (four studies, 554 women, low-quality evidence), perineal trauma (two studies, 308 women, low-quality evidence) or induction of labour (one study, 159 women, low-quality evidence). We found no difference between metformin and glibenclamide for the baby having low blood sugars (four studies, 554 infants, low-quality evidence), being born large-for-gestational age (two studies, 246 infants) or dying at birth (all low- or very low-quality evidence). In one study, the babies of the mothers taking metformin were at reduced risk of having any serious outcome (low blood sugar, jaundice, being born large, breathing problems, injury at birth or death combined) (low-quality evidence). One small

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study (43 women) comparing glibenclamide with acarbose reported no differences in outcomes for mothers or their babies.

None of the included studies provided any data on many of the outcomes pre-specified in this review, including long-term outcomes for the mother or for the baby as a child or an adult.

What does this mean?

There is not enough high-quality evidence available to guide us on if oral medication has better outcomes for women with gestational diabetes, and their babies, compared with a placebo or if one oral medication has better health outcomes than another oral medication. Because we are still unclear, further research is needed. Future studies should be encouraged to report on the outcomes suggested in this review and in particular the long-term outcomes for the woman and the infant that have been poorly reported to date.

Comparing electronic monitoring of the baby's heartbeat on a woman's admission in labour using cardiotocography (CTG) with intermittent monitoring

Authors: Devane D, Lalor JG, Daly S, McGuire W, Cuthbert A, Smith V

What is the issue?

When healthy women with low-risk pregnancies are admitted to labour wards, does a cardiotocograph (CTG) or listening to the fetal heart rate (FHR) for one minute following a contraction lead to better outcomes for mothers and their babies?

Why is this important?

Monitoring of the FHR is one of the most common methods for checking a baby's wellbeing. The two most common ways of monitoring the FHR are by listening to the heart beat using a fetal stethoscope, Pinard (special trumpet shaped device), hand-held Doppler ultrasound device (known as intermittent auscultation) or by an electronic fetal monitoring (EFM) machine that produces a printout of the baby’s heart rate and the mother’s contractions, called a CTG.

The admission CTG is a commonly used test consisting of a short, usually 20 minute, recording of the FHR and uterine activity that is performed when the woman is admitted to the labour ward with signs of labour. The admission CTG was introduced to try and identify those babies who were at greatest risk of becoming compromised with a lack of oxygen during labour. These babies could be monitored more intensively by continuous EFM, or they may benefit from an immediate intervention such as being delivered by caesarean section.

What evidence did we find?

We compared the admission CTG with intermittent auscultation of the FHR performed on the woman's admission to the labour ward. We searched for evidence to 30 November 2016 but found no new studies for this updated review (previously published in 2012). This review includes four studies and there is one study that is not yet complete. The included studies (carried out in the UK and Ireland) involved more than 13,000 women with low-risk pregnancies. Three trials were funded by the hospitals were the trials took place and one trial was funded by the Scottish government.

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Women allocated to admission CTG were probably more likely to have a caesarean section than women allocated to intermittent auscultation (moderate quality evidence). There was no difference in the number of instrumental vaginal births (low quality evidence) or in numbers of babies who died during or shortly after labour (moderate quality evidence) between women in the two groups. Admission CTG was associated with an increase in the use of continuous EFM (with an electrode placed on the baby's scalp) (low quality evidence) and fetal blood sampling (a small blood sample taken from a baby's scalp) during labour. There were no differences in other outcomes measured such as artificial rupture of the membranes, augmentation of labour, use of an epidural, damage to the baby's brain due to lack of oxygen (very low quality evidence), or the baby having fits or seizures just after birth (low quality evidence). No studies reported if the babies developed any severe problems in brain or central nervous system growth and development after one year of age.

What does this mean?

Although many hospitals carry out CTGs on women when they are admitted to hospital in labour, we found no evidence that this benefits women with low-risk pregnancies. We found that admission CTGs may increase numbers of women having a caesarean section by about 20%.

The included studies did not include enough women to show if admission CTGs or intermittent auscultation were better at keeping babies safe. However, studies to show which is better at keeping babies safe would have to be very large. Based on this review, low-risk pregnant women who have an admission CTG could be more likely to have a caesarean section. The benefits to these women of having an admission CTG are not certain.

All of the included studies took place in developed Western European countries. The review findings might not be useful to people in very different countries or where different ways of FHR monitoring are used. However, countries that use admission CTGs should start to question why, because there are not clear benefits to using admission CTGs, and they could be causing women harm by making them more likely to have a caesarean section.

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

Authors: Alfirevic Z, Devane D, Gyte GML, Cuthbert A

What is the issue?

Is continuous cardiotocography (CTG) to electronically monitor babies' heartbeats and wellbeing during labour better at identifying problems than listening intermittently?

Why is this important?

Monitoring babies' heartbeats is used to check wellbeing during labour. Listening and recording the baby's heartbeat aims to identify babies who are becoming short of oxygen and may benefit from an early delivery by caesarean section or instrumental vaginal birth.

A baby's heartbeat can be monitored intermittently using a special trumpet-shaped device, or hand-held Doppler device. The heartbeat can also be checked continuously using a CTG machine. Continuous CTG produces a paper recording of the baby's heart rate and the mother's labour contractions. Although

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continuous CTG provides a written record, mothers cannot move freely during labour, change positions easily, or use a birthing pool to help with comfort and control during labour. It also means that some resources tend to be focused on the need to constantly interpret the CTG and not on the needs of a woman in labour.

What evidence did we find?

We searched for evidence on 30 November 2016, but found no new studies for this update. We included 12 trials that compared continuous CTG monitoring with intermittent listening, and one trial compared continuous CTG with intermittent CTG. Together, the trials involved over 37,000 women. No trial compared continuous CTG with no monitoring. Most studies were undertaken before 1994, and apart from two, were not high quality. The review was dominated by one large, well-conducted trial from 1985 which involved almost 13,000 women who received one-to-one care throughout labour. The mothers' membranes were ruptured artificially as early as possible and about a quarter received oxytocin to stimulate contractions.

Overall, there was no difference in numbers of babies who died during or shortly after labour (about one in 300) (low quality evidence). Fits in babies were rare (about one in 500 births) (moderate quality evidence), but occurred less often when continuous CTG was used to monitor the baby's heart rate. There was no difference in the rate of cerebral palsy (low quality evidence); however, other possible long-term effects have not been fully assessed and need further study. Continuous monitoring was associated with significantly more deliveries by caesarean section (low quality evidence) and instrumental vaginal births (low quality evidence). Although both procedures carry risks for mothers, these were not assessed in the included studies.

There was no difference in numbers of cord blood acidosis (very low quality evidence), or women using any drugs for pain relief (low quality evidence) between groups.

Compared with intermittent CTG, continuous CTG made no difference to how many women had caesarean sections or instrumental births. There was less cord blood acidosis in women who had intermittent CTG but this result could have been due to chance.

What does this mean?

Most studies were undertaken many years ago and showed benefits and problems with both methods of monitoring the baby’s wellbeing in labour. Continuous CTG was associated with fewer fits for babies although there was no difference in cerebral palsy; both were rare events. However, continuous CTG was also associated with increased numbers of caesarean sections and instrumental births, both of which carry risks for mothers. Continuous CTG also makes moving and changing positions difficult in labour and women are unable to use a birthing pool. This can impact on women’s coping strategies. Women and their doctors need to discuss the woman’s individual needs and wishes about monitoring the baby’s wellbeing in labour.

Future research should focus on events that happen in pregnancy and labour that could be the cause of long term problems for the baby.

If you have any questions or comments with regard to the above document please feel free to contact me.

Kind regards

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