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Routine ultrasound scans for babies before 24 weeks of pregnancy.

Authors: Kaelin Agten A, Xia J, Servante JA, Thornton JG, Jones NW

We set out to determine the effect of routine ultrasound scans early in pregnancy (before 24 weeks). This was in comparison to no scan at all, or scans only when a clinical problem was suspected, such as if the woman has vaginal bleeding, or the baby is at high risk of having an abnormality.

What is the issue?

Ultrasound scans send out high-frequency sound waves directed to the area being examined, and use the reflected sound to make an image. This review considers two types of scan in the first half of pregnancy. Early scans (before 14 weeks) mainly aim to count the number of babies, to check they are growing in the correct place and check the pregnancy dates. Later scans, typically done around 18 to 24 weeks, recheck all the above, and also examine the baby's anatomy and whether the placenta (afterbirth) is in the correct place. Both types of scan may cause parental anxiety and a false positive diagnoses could lead to harm. The aim of this review is to compare routine with selective or no scans.

Why is this important?

It has been assumed that routine scans before 24 weeks' gestation will result in the earlier detection of problems and improve management and the pregnancy outcome. The alternative is selective scans for specific reasons.

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What evidence did we find?

We searched for randomised controlled trials. We found 13 studies including 85,265 women. We included two main comparisons.

Routine early scanning

Ultrasound scans in the first 14 weeks reduced short-term maternal worries about the pregnancy. There was no evidence of a clear effect on induction of labour to prevent the pregnancy going overdue, loss of the baby, early birth (before 34 weeks) or mothers choosing termination for baby abnormalities.

Routine later scanning

Second trimester scans, at 14 to 24 weeks, increased detection of baby abnormalities, and more women chose termination of pregnancy for this reason. There was no evidence of an effect on perinatal loss. Induction of labour to prevent the pregnancy going overdue was reduced. No studies reported how it affected maternal anxiety. Multiple pregnancies were more likely to be detected by 24 weeks. Long-term follow-up of children exposed to these scans did not indicate that they were harmful to children's physical or intellectual development.

We also found one trial from a group of low and middle income countries, comparing a combination of two scans and specialist training of health professionals and referral of women with complications, with selective scans and routine care. The intervention did not alter the number of women delivering in a hospital with caesarean section facility. Nor did it appear to reduce maternal deaths or the numbers of low-birthweight babies, although the evidence was very uncertain.

We also found one trial where all women underwent scans but the results were revealed to the health care professionals in half the cases. This trial showed no important effect of revealing the scan results but the evidence was very uncertain.

Most studies were carried out relatively early in the development of scan technology and when training in its use was less advanced. In most trials a large proportion of women in the control groups received a scan too.

What does this mean?

Early scans probably reduce maternal worries about the baby in the short term. Later scans may reduce labour induction to prevent the pregnancy going overdue. They may also improve detection of major abnormalities in the baby and increase the number of women who choose pregnancy termination for this reason. They may also reduce the number of undetected twin pregnancies. All these findings accord with common sense.

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Although neither type of scan appears to alter other important outcomes, our review may underestimate the effect in modern practice because the trials were mostly from relatively early in the development of scan technology, and many participants in the control arms also had scans.

Physiological track-and-trigger/early warning systems for use in maternity care

Authors: Smith V, Kenny LC, Sandall J, Devane D, Noonan M

What is the question?

The aim of this review is to find out from randomised controlled trials if using simple monitoring tools are helpful in alerting to clinical problems and in reducing serious illness or death in pregnant women and in their first six weeks after birth. Examples of such tools are track and trigger systems or early warning systems kept by the bedside in maternity care.

Why is this important?

Many natural functional changes occur in a woman's body during pregnancy. As a result, a pregnant woman, who may appear healthy and well, can become rapidly very sick. This is called clinical deterioration. If not detected sufficiently early and treated successfully, the pregnant woman can become seriously ill or even die. Examples are serious bleeding, development of convulsions when a woman has high blood pressure, blood clots and serious infection. Simple bedside tools or charts can be used by maternity care providers (midwives and doctors) to record information on a woman's health. The recorded health measures include her blood pressure, pulse rate, breathing rate, body temperature, and other health measures such as urine output and mental alertness. The tools have been introduced so that the measures are observed, recorded and interpreted together, rather than as single measures. The intention is to detect when serious illness is, or might be developing. Medical staff can then step in to prevent serious harm.

What evidence did we find?

We searched for evidence on 28 May 2021 and identified two studies that compared an early warning system with standard care. One study was a single-centre study involving 700 women and the second was a stepped-wedge cluster trial (multiple centres grouped into 'clusters') involving 536,233 women. Different clusters of centres introduced the tool over time until all centres were using the tool. Both studies were carried out in low-resource healthcare settings. The tools were called the 'Saving Mothers Score' (SMS) and the CRADLE Vital Sign Alert (VSA) device. Risk of bias in the two studies was low or unclear.

We found that the tools probably do not reduce maternal death. Women may have less serious bleeding (or haemorrhage) when an early warning tool is used. This finding was supported by low-certainty evidence. We

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also found that the tools may make little or no difference to a potentially life-threatening body response to infection (sepsis), to blood pressure with swelling, protein in the urine and convulsions (eclampsia), to a serious illness in pregnancy that affects the blood and the way the liver works (HELLP), or being admitted to an intensive care unit (ICU). Use of the tools probably reduces the time a woman stays in hospital (moderate-certainty evidence). We also found that the tools may make little or no difference to the death of the baby in the first month after birth (neonatal death). This finding was supported by low-certainty evidence. Neither of the two included studies reported cost outcomes.

What does this mean?

Use of early warning tools for women in maternity care in low-resource settings may reduce serious bleeding and probably reduces the number of days a woman stays in the hospital but may not reduce maternal or infant deaths. More studies are required on the different early warning systems in low-resource settings. Studies are also needed in middle- and high-resource settings, and in high- and low-risk pregnant women.

Instruments for assisted vaginal birth

Authors: Verma GL, Spalding JJ, Wilkinson MD, Hofmeyr GJ, Vannevel V, O'Mahony F

We used evidence from randomised controlled trials to assess the different forceps and vacuum suction cups used to achieve a vaginal birth.

What is the issue?

Late in labour, when the cervix (neck of the womb) is fully dilated, it is sometimes necessary to assist the birth of the baby through the vagina with an instrument. This may be because the mother is exhausted, suspected distress of the baby, or the mother has a medical condition preventing prolonged pushing.

Two types of instruments can be used: forceps or vacuum suction cups. Forceps are further divided into 'ordinary forceps' for when the baby's head is in the correct position and 'rotational forceps', which are used to turn the baby's head into the correct position. Vacuum cups can be divided into ones with rigid or flexible cups and into ones containing a handheld suction device or ones connected to a foot-operated or electric pump by a tube. This choice of instrument is often dictated by the clinical situation, but there is sometimes a choice.

Why is it important?

All types of instruments can cause complications for the mother or baby and all can also fail. It is therefore important to choose the correct instrument for the clinical situation with the best chance of ensuring a successful vaginal birth with the least risk of significant complications.

What evidence did we find?

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We conducted a search on 14th May 2021. Our findings are based on 31 studies with a total of 5754 women and their babies.

Twelve studies involving 3129 women compared any type of forceps with any vacuum cup. Forceps were more likely to achieve vaginal birth, but with a greater number of perineal tears including those affecting the anus or rectum (both low-certainty evidence). The was no evidence of a difference in rates of postpartum haemorrhage (heavy bleeding after birth) between groups (low-certainty evidence). There was no evidence of difference in the chances of low Apgar scores (a scoring system used to assess the baby's well-being at 1 and 5 minutes to determine how well they are coping after the birth) and low umbilical artery pH (blood test from the cord to assess the baby's oxygen levels immediately before birth) (both low-certainty evidence). Women who had forceps had higher pain relief requirements, although babies were less likely to be jaundiced.

Two small studies in 218 women compared low forceps to any vacuum cup, but most of the evidence was of very low certainty, so we could draw no meaningful conclusion.

Nine studies involving 1148 women compared rigid cups with soft cups and found that rigid cups may be more likely to result in a successful delivery (low-certainty evidence), whilst there is probably no evidence of a difference in the rates of perineal tears affecting the anus or rectum or postpartum haemorrhages (low- and moderate-certainty evidence). In addition there is no evidence of a difference in the rates of low Apgar and low umbilical artery pH (low-certainty evidence).

In four studies with a total of 962 women we found no evidence of difference in the chances of a failed delivery between the handheld vacuum-cup group compared to the standard vacuum-cup devices (low-certainty evidence). In addition there was no evidence of differences in the risk of maternal rectal tissue trauma (low-certainty evidence). Finally, there was no evidence of difference in the rates of postpartum haemorrhage, low umbilical artery pH or low Apgar between the two groups (low-certainty evidence).

What does this mean?

The decision on which instrument to use is multifactorial and needs to consider the skills and resources available and the urgency for the birth. The clinician needs to choose the instrument that is most likely to achieve a successful birth with the least trauma to the mother and baby.

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

Kind regards

Dr Vanessa Jordan PhD

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