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[Intervention Review]

Routine ultrasound in late pregnancy (after 24 weeks' gestation)

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ABSTRACT

Background

Diagnostic ultrasound is used selectively in late pregnancy where there are specific clinical indications. However, the value of routine late pregnancy ultrasound screening in unselected populations is controversial. The rationale for such screening would be the detection of clinical conditions which place the fetus or mother at high risk, which would not necessarily have been detected by other means such as clinical examination, and for which subsequent management would improve perinatal outcome.

Objectives

To assess the effects on obstetric practice and pregnancy outcome of routine late pregnancy ultrasound, defined as greater than 24 weeks' gestation, in women with either unselected or low-risk pregnancies.

Search methods

We searched the Cochrane Pregnancy and Childbirth Group's Trials Register (31 May 2015) and reference lists of retrieved studies.

Selection criteria

All acceptably controlled trials of routine ultrasound in late pregnancy (defined as after 24 weeks).

Data collection and analysis

Three review authors independently assessed trials for inclusion and risk of bias, extracted data and checked them for accuracy.

Main results

Thirteen trials recruiting 34,980 women were included in the systematic review. Risk of bias was low for allocation concealment and selective reporting, unclear for random sequence generation and incomplete outcome data and high for blinding of both outcome assessment and participants and personnel. There was no difference in antenatal, obstetric and neonatal outcome or morbidity in screened versus control groups. Routine late pregnancy ultrasound was not associated with improvements in overall perinatal mortality. There is little information on long-term substantive outcomes such as neurodevelopment. There is a lack of data on maternal psychological effects.

Overall, the evidence for the primary outcomes of perinatal mortality, preterm birth less than 37 weeks, induction of labour and caesarean section were assessed to be of moderate or high quality with GRADE software. There was no association between ultrasound in late pregnancy and perinatal mortality (risk ratio (RR) 1.01, 95% confidence interval (CI) 0.67 to 1.54; participants = 30,675; studies = eight; I^2 = 29%), preterm birth less than 37 weeks (RR 0.96, 95% CI 0.85 to 1.08; participants = 17,151; studies = two; I^2 = 0%), induction of labour (RR 0.93, 95% CI 0.81 to 1.07; participants = 22,663; studies = six; I^2 = 78%), or caesarean section (RR 1.03, 95% CI 0.92 to 1.15; participants = 27,461; studies = six; I^2 = 54%). Three additional primary outcomes chosen for the 'Summary of findings' table were preterm birth less

than 34 weeks, maternal psychological effects and neurodevelopment at age two. Because none of the included studies reported these outcomes, they were not assessed for quality with GRADE software.

Authors' conclusions

Based on existing evidence, routine late pregnancy ultrasound in low-risk or unselected populations does not confer benefit on mother or baby. There was no difference in the primary outcomes of perinatal mortality, preterm birth less than 37 weeks, caesarean section rates, and induction of labour rates if ultrasound in late pregnancy was performed routinely versus not performed routinely. Meanwhile, data were lacking for the other primary outcomes: preterm birth less than 34 weeks, maternal psychological effects, and neurodevelopment at age two, reflecting a paucity of research covering these outcomes. These outcomes may warrant future research.

PLAIN LANGUAGE SUMMARY

Routine ultrasound in late pregnancy (after 24 weeks' gestation) to assess the effects on the infant and maternal outcomes

Ultrasound can be used as a clinical diagnostic tool in late pregnancy to assess the baby's condition when there are complications, or to detect problems which may not otherwise be apparent. If such problems are identified this may lead to changes in care and an improved outcome for babies. Carrying out scans on all women is however controversial. Screening all women may mean that the number of interventions is increased without benefit to mothers or babies. Although popular, women may not fully understand the purpose of their scan and may be either falsely reassured, or unprepared for adverse findings. Existing evidence shows that routine ultrasound, after 24 weeks' gestation, in low-risk or unselected women does not provide any benefit for the mother or her baby. Thirteen studies involving 34,980 women who were randomly selected to screening or a control group (no or selective ultrasound, or ultrasound with concealed results) contributed to the review. The quality of trials was satisfactory. There were no differences between groups in the rates of women having additional scans, antenatal admissions, preterm delivery less than 37 weeks, induction of labour, instrumental deliveries or caesarean section. Babies' birthweight, condition at birth, interventions such as resuscitation, and admission to special care were similar between groups. Infant survival, with or without congenital abnormalities, was no different with and without routine ultrasound screening in late pregnancy. None of the trials reported on the effect of routine ultrasound in late pregnancy on preterm birth less than 34 weeks, maternal psychology or mental development of babies when two years old.

The ultrasound scan protocols in each trial varied, as did the reasons for ultrasound scans after 24 weeks' gestation. The influence of first and second trimester ultrasounds is difficult to disentangle, and assessment of most measures at late pregnancy is based on gestational reference data, which rely on accurate gestational dating in early pregnancy. Trials were undertaken over a period of time covering early introduction into clinical practice to widespread use, during which time how to assess fetal size and well being ultrasonographically were still being debated. As ultrasound technology continues to advance and become more accessible, it is important to maintain a clear idea of its relevance. Ultrasound, being a clinical investigation, may be used to detect abnormality without the impact of such detection on clinical outcomes being full assessed. Exposure of the expectant mother to uncertainty and possible anxiety about the health of her baby has implications that may be far reaching. In addition, little is known about how the baby that was compromised in the uterus develops after birth and in the first years of life.