Antenatal exercise to improve outcomes in overweight or obese women: a systematic review

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CRD summary
This review concluded that supervised antenatal exercise for overweight or obese women appeared to be beneficial in limiting gestational weight gain. The conduct of this review was generally good, and the conclusions were suitably cautious, given the lack of high-quality evidence.

Authors' objectives
To review the effects of antenatal exercise for pregnant women who were overweight or obese.

Searching
PubMed, Scopus, Cochrane Central Register of Controlled Trials (CENTRAL), ANZCTR, and ICTRP were searched, without date or language restrictions. Search terms were reported. Reference lists of reviews and included articles were handsearched.

Study selection
Published randomised or quasi-randomised controlled trials of a monitored lifestyle, exercise or physical activity intervention, for pregnant women who were overweight or obese, were eligible for inclusion. The control had to be standard antenatal care, without encouragement to increase physical activity. Being overweight was defined as having a body mass index (BMI) of 25 to 29.9 kg per m²; obesity was defined as a BMI of 30 kg/m² or more. The primary outcome was maternal gestational weight gain. Secondary outcomes related to pregnancy, birth, and infant and child health – details were reported.

The included trials were published between 2004 and 2011, and conducted in Europe, Australia, or North or South America. They evaluated exercise interventions that varied, focusing on aerobic exercise or resistance training. Control groups received standard antenatal care alone, with the addition of a relaxation session per week, or with dietary advice. Trials recruited women in all BMI categories; obese or overweight women, who were otherwise healthy and in their second trimester; or women in their third trimester with a diagnosis of gestational diabetes.

Trials were selected by three reviewers independently.

Assessment of study quality
The risk of bias was assessed, using the Cochrane Collaboration methods, for selection, performance, attrition, detection and reporting, as well as trial design and size. The assessment was performed by three reviewers independently.

Data extraction
The data were extracted to calculate standardised mean differences, with 95% confidence intervals. The authors did not state how many reviewers extracted the data.

Methods of synthesis
If the interventions and populations were judged to be sufficiently similar, the results were pooled using a fixed-effect inverse-variance meta-analysis. Random-effects analysis was used in the presence of substantial statistical heterogeneity (I² of 50% or more). Possible reasons for heterogeneity were explored in sensitivity analyses, assessing the effects of trial quality. Subgroup analysis was used to compare obese versus overweight women.

Results of the review
Seven trials were included. Six were randomised controlled trials (254 participants), and one was quasi-randomised (22 participants). Six trials had adequate randomisation methods, four described allocation concealment, and one reported blinding the researchers to the randomised group. Where reported, the loss to follow-up ranged from 2.4 to 22%.

Overweight or obese women, on a supervised exercise programme, gained significantly less weight during pregnancy.
than those receiving antenatal care alone (SMD -0.36, 95% CI -0.64 to -0.09; five trials; \( I^2 = 0 \)). Subgroup analysis did not find any evidence of a difference between overweight and obese women.

Three trials reported neonatal outcomes including gestational age, birth weight, and Apgar scores. One did not report separate results for overweight and obese women, and the other two did not find any significant differences. Five trials reported glucose tolerance or cardiorespiratory measures of exercise tolerance, and they suggested a benefit from exercise training.

**Authors' conclusions**

Supervised antenatal exercise for overweight or obese women appeared to be beneficial in limiting gestational weight gain.

**CRD commentary**

This review specified clear inclusion criteria for study design, intervention, comparators, participants and outcomes. Several databases and clinical trial registers were searched, without language restrictions, minimising the risk of language bias. Only published trials were included, and publication bias was possible. The trials were selected and quality assessed by three reviewers, to minimise errors and bias, but the number who extracted the data was not reported. The methods of meta-analysis seem to have been appropriate.

The conduct of this review was generally good, and the conclusions were suitably cautious, given the lack of high-quality evidence.

**Implications of the review for practice and research**

**Practice:** The authors stated that there was insufficient evidence to make recommendations for clinical care.

**Research:** The authors stated that well-designed, adequately powered randomised controlled trials were needed to explore the effect of exercise on clinical outcomes, and the optimal intensity of exercise and its acceptability, in overweight or obese pregnant women.

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