

OBSTETRICS

Effect of physical activity during pregnancy on mode of delivery

Iris Domenjuz, MBBS; Bengt Kayser, MD, PhD; Michel Boulvain, MD, PhD

OBJECTIVE: The purpose of this study was to evaluate the effect of structured physical exercise programs during pregnancy on the course of labor and delivery.

STUDY DESIGN: We conducted a systematic review and metaanalysis using the following data sources: Medline and The Cochrane Library. In our study, we used randomized controlled trials (RCT) that evaluated the effects of exercise programs during pregnancy on labor and delivery. The results are summarized as relative risks.

RESULTS: In the 16 RCTs that were included there were 3359 women. Women in exercise groups had a significantly lower risk of cesarean delivery (relative risk, 0.85; 95% confidence interval [CI], 0.73–0.99). Birthweight was not significantly reduced in exercise groups. The risk of instrumental delivery was similar among groups

(relative risk, 1.00; 95% CI, 0.82–1.22). Data on Apgar score, episiotomy, epidural anesthesia, perineal tear, length of labor, and induction of labor were insufficient to draw conclusions. With the use of data from 11 studies (1668 women), our analysis showed that women in the exercise groups gained significantly less weight than women in control groups (mean difference, -1.13 kg; 95% CI, -1.49 to -0.78).

CONCLUSION: Structured physical exercise during pregnancy reduces the risk of cesarean delivery. This is an important finding to convince women to be active during their pregnancy and should lead the physician to recommend physical exercise to pregnant women, when this is not contraindicated.

Key words: cesarean, delivery, physical activity, pregnancy

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The number of cesarean delivery deliveries increased steadily during the last decades.^{1,2} Although cesarean delivery has become safer, it remains an invasive procedure with potential morbidity and death for both mother and her child.³ Short-term maternal risks include infection, thromboembolism and hemorrhage, sometimes severe enough to be life threatening.⁴ The increase of cesarean deliveries also raises concerns about longer term morbidity such as uterine rupture and placenta previa and/or accreta during subsequent pregnancies and adhesions with chronic

pain as a consequence of the surgical procedure.⁴ Obstetricians therefore should restrict the use of cesarean delivery for sound medical reasons only, and interventions effective in decreasing the risk would be welcome.

Observational studies have suggested that regular exercise during pregnancy reduces the risk of cesarean deliveries.⁵⁻⁷ Several randomized controlled trials have attempted to measure the effect of structured exercise programs on various outcomes, including gestational diabetes mellitus and preeclampsia. Some trials were conducted to evaluate directly the relation between physical activity and cesarean delivery risk; only 1 trial found a significant effect.⁸ Most of the studies were of relatively small sample size and were not powered to show a difference in obstetric outcomes. A metaanalysis of these studies may increase the likelihood to identify a benefit from exercise programs.

We performed a systematic review of randomized controlled trials to determine whether structured physical training programs during pregnancy can improve the course of labor and delivery.

MATERIALS AND METHODS

This review was conducted in accordance with the “preferred reporting items for systematic reviews and meta-analyses” statement.^{9,10}

Search strategy

We searched electronic databases, Medline (PubMed), and the Cochrane Library, using the words: «pregnancy AND exercise AND (randomized OR randomized)». We scanned the reference lists of identified relevant articles. We imposed neither language nor publication date restrictions. The last search was run in March 2013.

Eligibility criteria

The eligibility criteria were (1) randomized controlled trials (ie, mentioned as randomized in title, abstract, or full text), (2) included women of any age, parity, and body mass index (BMI) with a singleton pregnancy and none of the absolute obstetrics contraindications to exercise according to the American College of Obstetricians and Gynecologists (ACOG),¹¹ (3) comparison of exercise program vs no exercise program (the exercise program should

From the Faculty of Medicine of Geneva (Dr Boulvain and Ms Domenjuz) and the Institute of Sports Sciences, University of Lausanne (Dr Kayser), Switzerland.

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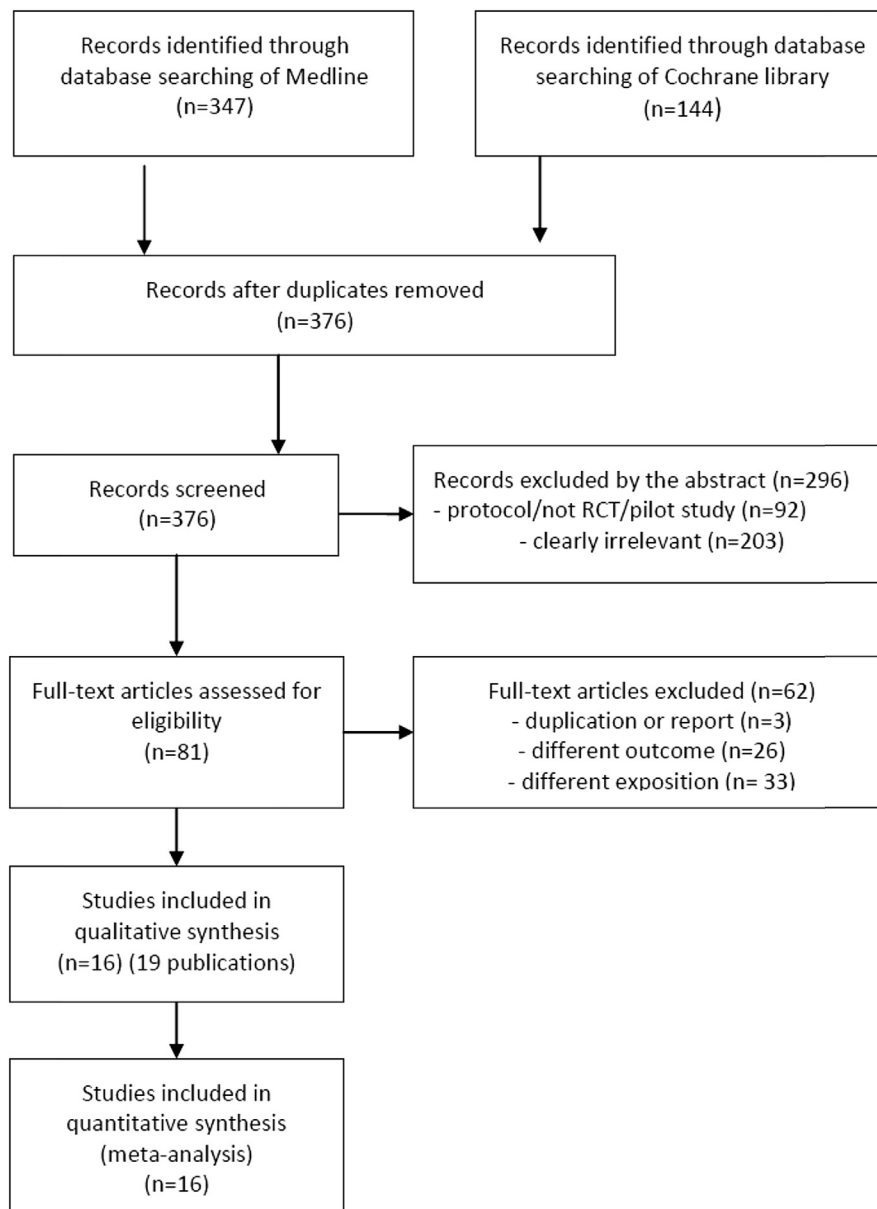
Reprints: Iris Domenjuz, MBBS, University Hospital of Geneva, Gabrielle perret gentil 4, Geneve, Geneve 1205, Switzerland.

domenjuzi@bluewin.ch.

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FIGURE 1
Diagram flow chart

RCT, randomized controlled trial.

Domenjoz. Physical activity reduces cesarean delivery. *Am J Obstet Gynecol* 2014.

include resistance or aerobic exercise; minimum 1 session per week, supervised, to ensure it was carried out with a minimum level of intensity and regularly, thus providing some homogeneity in the intervention group; studies with an intervention limited to pelvic floor exercises, stretching, or relaxation were excluded), (4) trials that reported the mode of delivery, that included the percentage of cesarean and instrumental

delivery and/or any of the following outcomes: Apgar score, duration of labor, episiotomy, epidural anesthesia, induced labor, and delivery lacerations.

Contact was attempted with authors of articles that included an adequate intervention but that did not report the prespecified outcomes. Among 17 authors who we contacted, 13 authors responded, and 1 author provided additional unpublished data.¹² Barakat

et al¹³⁻¹⁹ assured us that there was no overlap of participants in their reports.

Data collection

Two of the authors (I.D. and M.B.) performed the first screening, studies appraisal, and data extraction; the third author (B.K.) verified the data collection. We extracted data on (1) type of participants: inclusion and exclusion criteria, age, BMI, parity, prepregnancy level of physical activity, type of recruitment, percentage of dropout, and pregnancy weight gain; (2) type of intervention in the exercise group: number of hours per training and per week, when the intervention started and finished, type of exercise, how the women were supervised, and compliance; (3) control group: if asked not to exercise and how any exercise habits were assessed; and (4) outcomes mentioned earlier and birth-weight (which could be considered as a potential effect of the intervention or as confounding factor).

The ACOG recommends 30 minutes of exercise on most days of the week, which means a minimum of 2 hours per week. An intervention that follows these guidelines during 2 trimesters would total approximately 50 hours of exercise. For each study, we calculated the number of hours of exercise planned and used the percentage of compliance (available for 11 studies) to estimate the amount of exercise carried out.

Risk of bias

To ascertain the validity of eligible randomized trials, we determined adequacy of concealment of allocation, sequence generation, blinding of the obstetrician and data collector, and percentage of loss to follow up. We used the Jadad score, which is a scale that ranges from 0–5 points to assess the quality of randomization.²⁰ Because blinding of the women was impossible, a maximum of 3 points could be obtained.

Statistical analysis

Our primary analysis was a comparison of the risk of cesarean delivery in women who participated in a structured physical activity program compared with women in the control groups. We

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