



## Q/ Does caffeine intake during pregnancy affect birth weight?

### EVIDENCE-BASED ANSWER

**A/** No. Reducing caffeinated coffee consumption by 180 mg of caffeine (the equivalent of 2 cups) per day after 16 weeks' gestation doesn't affect birth weight. Consuming more than 300 mg of caffeine per day is associated with

a clinically trivial, and statistically insignificant (less than 1 ounce), reduction in birth weight, compared with consuming no caffeine (strength of recommendation: **B**, randomized controlled trial [RCT] and large prospective cohort study).

### Evidence summary

A Cochrane systematic review of the effects of caffeine on pregnancy identified 2 studies, only one of which addressed the question of maternal caffeine intake and infant birth weight.<sup>1</sup> The double-blind RCT evaluating caffeine intake during pregnancy found no significant differences in birth weight or length of gestation between women who drank regular coffee and women who drank decaffeinated coffee.<sup>2</sup>

At 16 weeks' gestation, investigators randomized 1207 pregnant women who reported daily intake of at least 3 cups of regular coffee to drink unlabeled instant coffee (which was either regular or decaffeinated) for the rest of their pregnancy. The women were allowed to request as much of their assigned instant coffee as they wanted.

Subjects were recruited from among all women with uncomplicated, singleton pregnancies who were expected to deliver at a Danish university hospital during the study period. Investigators interviewed the women at 20, 25, and 34 weeks to determine coffee consumption (including both coffee provided by the investigators and other coffee), consumption of other caffeinated beverages, and smoking status.

The difference in caffeine intake between the groups didn't correspond to significant differences in birth weight (16 g lighter with caffeinated coffee; 95% confidence inter-

val [CI], -40 g to 73 g;  $P=.48$ ) or birth length (0.03 cm longer with caffeinated coffee; 95% CI, -0.29 to 0.22) among infants born to the 1150 women who completed the study.

Limitations of the study include randomizing women after 16 weeks' gestation and the observation that many women correctly guessed which type of coffee they received (35% of women drinking caffeinated coffee and 49% of women drinking decaf).

### A caffeine effect, but with study limitations

The Cochrane systematic review (described above) and a meta-analysis of 9 prospective cohort studies with a total of 90,000 patients that evaluated maternal caffeine intake found that it was associated with increased low birth weight, intrauterine growth restriction (IUGR), or small for gestational age (SGA) infants.<sup>3</sup>

Researchers assessed caffeine consumption from coffee or other sources either by questionnaire (5 studies) or interview (4 studies) at various times during pregnancy, mostly in the first or second trimester, and assigned subjects to 4 intake categories: none, low (50-149 mg/d), moderate (150-349 mg/d), and high (>350 mg/d).

Compared with no caffeine, all levels of caffeine intake were associated with increased rates of low birth weight, IUGR, or SGA (low intake: relative risk [RR]=1.13;

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95% CI, 1.06-1.21; moderate intake: RR=1.38; 95% CI, 1.18-1.62; high intake: RR=1.60; 95% CI, 1.24-2.08).

A major limitation of the meta-analysis was that 8 of the included studies were identified by the reviewers as having quality problems. The reviewers also identified additional cohort studies, not included in the meta-analysis, which failed to show any association between caffeine intake and poor pregnancy outcomes.

### Results of best-quality study prove clinically trivial

The best-quality prospective cohort study in the review described above was also the largest, comprising two-thirds of the total patients. It found a statistically significant, but clinically trivial, association between caffeine intake and birth weight.<sup>4</sup>

Investigators from Norway's Institute of Public Health mailed surveys to 106,707 pregnant Norwegian women and recruited 59,123 with uncomplicated singleton pregnancies. The survey assessed diet and lifestyle at several stages of pregnancy and correlated caffeine intake with birth weight, gestational

length, and SGA deliveries. Investigators calculated caffeine intake from coffee and other dietary sources (tea and chocolate).

Higher caffeine intake was associated with a small reduction in birth weight (8 g/100 mg/d of additional caffeine intake; 95% CI, -10 to -6 g/100 mg/d). Higher intake was also associated with increasing likelihood of SGA birth, a finding of borderline significance (odds ratio [OR]=1.18; 95% CI, 1.00-1.38, comparing intake <50 mg/d with 51-200 mg/d; OR=1.62; 95% CI, 1.26-2.29, comparing <50 mg/d with 201-300 mg/d; and OR=1.62; 95% CI, 1.15-2.29, comparing <50 mg/d with >300 mg/d).

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### References

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