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Caffeine and pregnancy outcome: the CARE Study

The Care Study Group[1,2]

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Conflicting reports have been published concerning the effect of caffeine[(1)], the most widely consumed xenobiotic in pregnancy on birth weight. Differences in study design and exposure definition have been partly responsible and present particular challenges.

In order to examine the effect of maternal caffeine intake on fetal wellbeing, a new caffeine assessment tool to prospectively quantify total caffeine intake throughout pregnancy was developed and evaluated. Account was also taken of the inter-individual variation in caffeine metabolism. Using these data the aim was to establish the safer upper limit of caffeine consumption in relation to fetal growth restriction (FGR) in pregnancy.

A total of 2635 pregnant women were recruited and their total caffeine intake throughout pregnancy was quantified. Information was also obtained on potential confounders such as alcohol and smoking. Caffeine clearance was determined using a caffeine challenge and measuring caffeine half-life in saliva. The primary outcome measure was FGR defined as birth weight below the 10th centile using customised charts (www.gestation.net)[(2)].

The most common sources of caffeine in pregnancy were tea (62%), coffee (14%) and cola drinks (12%), whilst chocolate represented 8%. Caffeine consumption substantially increased the risk of FGR: OR 1.2 (95% CI 0.9, 1.6) for 100–199 mg/d; OR 1.5 (95% CI 1.1, 2.1) for 200–299 mg/d; OR 1.4 (95% CI 1.0, 2.0) for >300 mg/d compared with <100 mg/d ($P<0.001$ for trend)[(3)]. A similar picture was seen for caffeine expressed as a dose (mg/kg per d; Table). The effect of caffeine on the risk of FGR was of a similar size to that found for alcohol intake in these women.

Caffeine (mg/kg per d)*	OR†	95% CI	*P* for trend
<1.00	1	–	
1.00–1.99	1.2	0.9, 1.7	
2.00–3.99	1.4	1.0, 1.9	
≥4.00	1.5	1.1, 2.2	0.02

*Average over pregnancy (*n* 2384). †Adjusting for cotinine concentration and alcohol intake.

The study found that caffeine consumption during pregnancy significantly increases the risk of having a growth-restricted fetus and this effect is continuous throughout pregnancy. New advice has been issued to restrict caffeine intake in pregnancy to <200 mg/d.

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