217

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LONG-TERM IMPACT OF MODE OF DELIVERY ON STRESS AND URGENCY URINARY INCONTINENCE: A SYSTEMATIC REVIEW AND META-ANALYSIS

Hypothesis / aims of study

To perform a systematic review and meta-analysis to investigate the long-term impact of mode of delivery on stress urinary incontinence (SUI) and urgency urinary incontinence (UUI).

Study design, materials and methods

We searched MEDLINE, Scopus, and CINAHL, and abstracts from relevant major conferences, without language restrictions, up to October 2014. Any randomized trial or cross-sectional or cohort study comparing estimates for the impact of at least two different delivery modes on the risk of SUI or UUI more than 1 year post delivery were eligible. To address confounding, we excluded observational studies without an adjusted analysis. We evaluated the risk of bias in each study according to six criteria: sampling and representativeness of population, assessment of the exposure, assessment of the outcome, presence of the outcome at the start of study, adjustment for confounding, and missing data. We calculated pooled estimates using random effects meta-analysis, assessed heterogeneity using the I^2 statistic and Cochran's Q, and addressed possible explanations of heterogeneity using metaregression. To calculate the absolute difference in risk of SUI/UUI with vaginal birth versus caesarian section, we estimated the risk of SUI/UUI after caesarian section using two large, population based studies (1,2), and then used the odds ratio to calculate the risk with vaginal delivery (3). The review protocol was prospectively registered, and reporting followed the Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) guidance.

Results

Our search yielded 3,487 potentially relevant reports of which 16 studies for SUI, and 8 studies for UUI proved eligible. Pooled estimates from 15 studies (7 at low and 8 at high risk of bias) demonstrated almost twice the risk of SUI after vaginal delivery compared to caesarean section (adjusted OR 1.85, 95% confidence interval 1.56-2.19; heterogeneity: p=0.003, I^2=56.8%, absolute risk difference 8.2%) (Fig 1). A meta-regression demonstrated that the association was strongly age dependent (p=0.005), with a significantly greater impact of vaginal delivery in younger women (Fig 2). Pooled estimates from two studies (both at high risk of bias) suggested a more than three times increased risk of SUI when compared to pre-labour elective caesarean (adjusted OR 3.53, 95% CI 2.55-4.90; heterogeneity: p =0.84, I^2=0.0%, absolute risk difference 10.7%). Four studies (2 at low and 2 at high risk of bias) suggested no difference in the risk of SUI between spontaneous vaginal delivery and instrumental delivery (adjusted OR 1.11, 95% CI 0.84-1.45; heterogeneity: p=0.11, I^2=49.7%). Eight studies (3 at low and 5 at high risk of bias) suggested a modest increase in risk of UUI after vaginal delivery compared to caesarean section (adjusted OR 1.30 95%CI 1.02-1.65; heterogeneity: p=0.14, I^2=36.7%, absolute risk difference 2.6%).

Interpretation of results

Evidence from observational studies suggests that caesarean, especially elective caesarean, section results – relative to vaginal delivery – in a reduction in the absolute risk of SUI of over 10%, and therefore that a high caesarean rate may diminish the burden of SUI. The impact is age dependent and decreases in cohorts of older women. The risk of UUI is also increased after vaginal delivery but the pooled absolute difference is so small (2.6%) that caesarean section rates will have only a small impact on UUI at a population level. Evidence suggests no difference in the risk of SUI if planned vaginal delivery results in instrumental delivery instead of spontaneous vaginal delivery. These data help quantify one important benefit of caesarean section, which can be used to inform and counsel women when making choices about planned mode of delivery**.**

Concluding message

Vaginal delivery is associated with approximately twice the long-term risk of SUI, an absolute increase of approximately 8%, when compared to caesarean section, and with more than triple the risk, an absolute increase of over 10%, when compared specifically to pre-labour elective caesarean. The gradient of risk diminishes in cohorts of older women. The risk of SUI does not differ between spontaneous vaginal and instrumental delivery. Vaginal delivery is also modestly associated with increased risk of UUI when compared to caesarean section.

Figure 1. Forest plot, risk of stress urinary incontinence between vaginal delivery and caesarean section

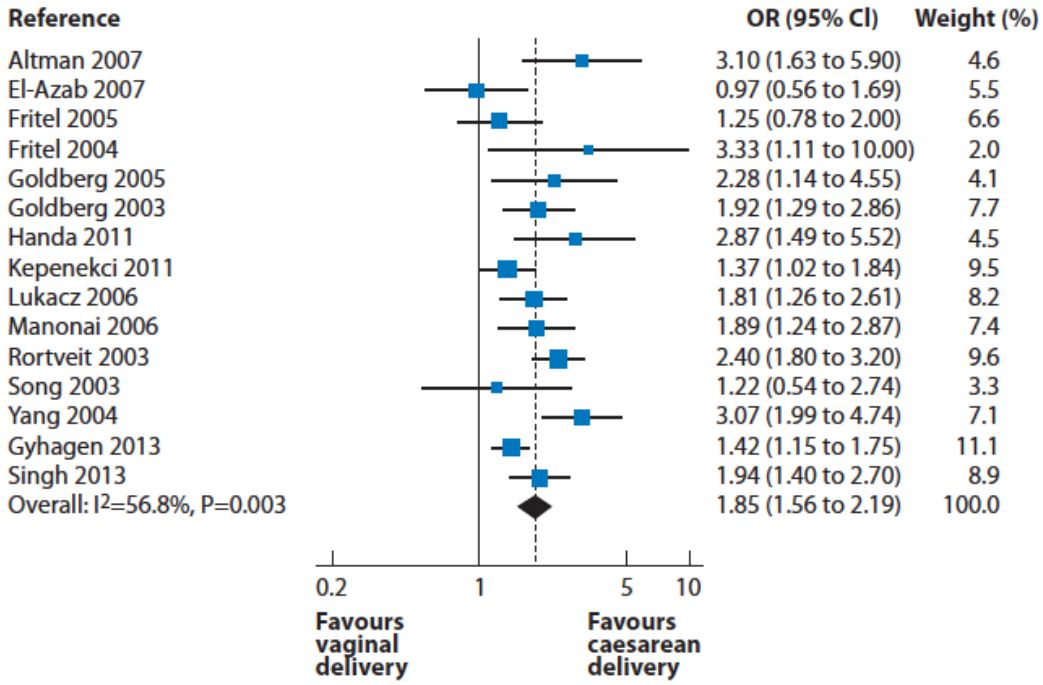
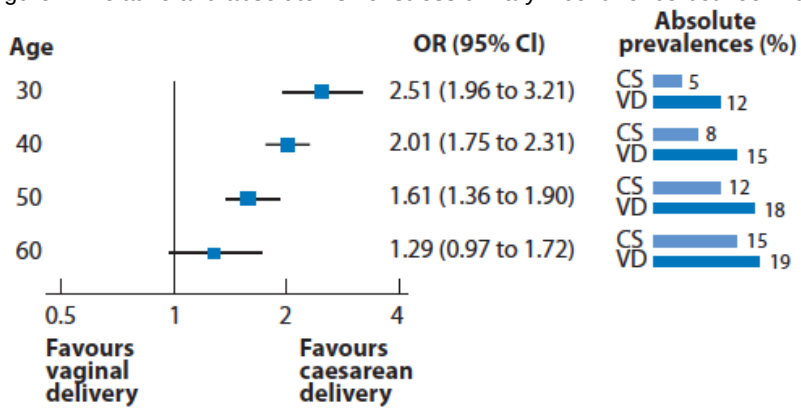


Figure 2. Relative and absolute risk of stress urinary incontinence between vaginal delivery and caesarean section by age group



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Disclosures

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