

Physical Exercise vs. Metformin to Improve Delivery- and Newborn-Related Outcomes Among Pregnant Women With Overweight: A Network Meta-Analysis

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Abstract

Background: Overweight/obesity is associated with the risk of delivery- and newborn-related complications in pregnancy. Interventions such as exercise or metformin could reduce the risk of these complications. Objective: To estimate and compare the effects of different types of exercise interventions (i.e., aerobic, resistance, combined exercise) and metformin on delivery- and newborn-related outcomes among pregnant women with overweight/obesity. Methods: MEDLINE, Scopus, Web of Science, Cochrane Library databases and the gray literature were searched from inception to September 2021. This systematic review was registered in PROSPERO (CDR: 42019121715). Randomized controlled trials (RCTs) of metformin or an exercise intervention aimed at preventing cesarean section, preterm birth, macrosomia, or birth weight among pregnant women with overweight/obesity were included. Random effects meta-analyses and frequentist network meta-analyses (NMA) were conducted for each outcome. Results: Fifteen RCTs were included. In the NMA, metformin reduced the risk of cesarean section (RR = 0.66, 95% CI: 0.46, 0.95), combined exercise reduced the risk of macrosomia (RR = 0.37, 95% CI: 0.14, 0.95), and aerobic exercise reduced birth weight (mean difference = -96.66 g, 95% CI: -192.45, -0.88). In the subgroup among pregnant women with obesity, metformin reduced the risk of cesarean section (RR = 0.66, 95% CI: 0.45, 0.97). Conclusions: Combined exercise could reduce the risk of macrosomia in pregnant women with overweight, whereas metformin could reduce the risk of cesarean section in pregnant women with obesity. However, previous evidence suggests a larger effect of physical exercise in other outcomes for this population group. Therefore, the medicalization of healthy pregnant women with obesity is not justified by the current evidence. Systematic Review Registration: PROSPERO: CRD42019121715; https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42019121715

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Author keywords

exercise; metformin; network meta-analysis; obesity; overweight; pregnancy; systematic review