

Association of maternal obesity with preterm birth phenotype and mediation effects of gestational diabetes mellitus and preeclampsia:a prospective cohort study

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Abstract

Objectives: To clarify the relationship between prepregnancy body mass index (BMI) and the phenotypes of preterm birth and evaluate the mediation effects of gestational diabetes mellitus (GDM) and preeclampsia (PE) on the relationship between prepregnancy BMI and preterm birth. **Design:** Prospective cohort study **Setting:** Shenzhen Maternity & Child Healthcare Hospital **Population or Sample:** 42196 singleton livebirths **Methods:** Prospective cohort study using the Birth Cohort in Shenzhen (BiCoS) dataset. **Main Outcome Measures:** Preterm birth was defined as gestational age less than 37 weeks. **Results:** Risks of extremely, very, and moderately preterm birth increased with BMI, and the highest risk was observed for obese women with extremely preterm birth (OR 3.43, 95% CI 1.07–10.97). Maternal obesity was significantly associated with spontaneous preterm labor (OR 1.98; 95% CI 1.13–3.47), premature rupture of the membranes (OR 2.04; 95% CI 1.08–3.86) and medically indicated preterm birth (OR 2.05; 95% CI 1.25–3.37). GDM and PE mediated 13.41% and 36.66% of the effect of obesity on preterm birth, respectively. GDM mediated 32.80% of the effect of obesity on spontaneous preterm labor and PE mediated 64.31% of the effect of obesity on medically indicated preterm birth. **Conclusions:** Maternal prepregnancy obesity was associated with all phenotypes of preterm birth, and the highest risks were extremely preterm birth and medically indicated preterm birth. GDM and PE partially mediated the association between obesity and preterm birth. **Funding:** NSFC(81830041, 81771611); Shenzhen Science and Technology Project (JCYJ20170412140326739) **KEYWORDS:** obesity, prepregnancy BMI, preterm birth, phenotype, gestational diabetes mellitus, preeclampsia

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