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Maternal diabetes as a risk factor for high blood pressure in late childhood: a prospective birth cohort study

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Intrauterine fetal conditions can have lifelong cardiovascular effects. The impact of maternal diabetes on children cardiovascular profile is not well-established. The goal of this study was to examine the association between maternal diabetes and offspring's blood pressure up to 10 years of age and to explore BP trajectories in this age range.
Generation XXI is a prospective birth cohort which enrolled 8301 mother-offspring pairs, including 586 (7.1%) children of diabetic mothers. The associations between maternal diabetes and blood pressure at 4, 7 and 10 years of age was modeled using linear regression. A mixed-effects model was built to assess differences in blood pressure variation over time. Path analysis was used to quantify effects of potential mediators.
Maternal diabetes was associated with higher blood pressure in offspring at age of 10 (systolic blood pressure: β 1.48, 95% CI: 0.36, 2.59; diastolic blood pressure: β 0.86, 95% CI: 0.05, 1.71). This association was independent of maternal perinatal characteristics and it was partly mediated by child´s body mass index and, to a lesser extent, by gestational age, type of birth and birthweight (indirect effect proportion 73%). No significant differences in blood pressure levels were found at 4 and 7 years-old. Longitudinal analysis showed an accelerated systolic blood pressure growth on maternal diabetes group (β 1.16, 95% CI: 0.03, 2.28). These finding were especially relevant in males, suggesting sex differences in the mechanisms of blood pressure prenatal programming. Our results provide further evidence that maternal diabetes is associated with higher blood pressure late in childhood, demonstrating a significant role of child´s body mass in the pathway of this association.