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Maternal smoking before and during pregnancy and congenital heart defects

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Introduction/Aim: Maternal smoking before and during pregnancy has been associated with increased risk for congenital heart defects. The aim of this study was to examine the effect of maternal smoking before and during pregnancy to the frequency of congenital heart defect (CHD) and determine the risk for select CHD phenotypes.

Methods: In a retrospective case-control study, the association between congenital heart defects and maternal smoking was investigated. Data was attained from the archives of a Pediatric Cardiology unit during a 16-year period (2005-2015). An in-person interview was performed to the mothers of children with congenital heart defects and mothers of children with structurally normal heart matched by the year of delivery. Mothers reported smoking behavior during 5 time periods: 4-6 months before conception, 1-3 months before conception, first trimester of pregnancy, second and third trimester of pregnancy. The number of cigarettes was grouped in the following categories: 0, 1-10, 11-20, 21-39, ≥40 cigarettes per day. A logistic regression model was used to control for confounding factors.

Results: Of the 10.537 children examined in the Pediatric Cardiology Unit during this time period, 989 were found with congenital heart defects. The most frequent congenital heart disease was Ventricular Septal Defect (376 cases, 38%). It was also found a statistically significant positive association between maternal smoking (a month before conception and during the first trimester) with pulmonary valve stenosis (OR 1.34, 95% CI 1.05-1.73) and atrial septal defects (OR 1.41, 95% CI 1.04-1.79).

Conclusions: Maternal smoking before and during the first trimester of pregnancy is related to higher risk for atrial septal defects and pulmonary valve stenosis.