Smoking during pregnancy associated with child's risk of congenital heart disease

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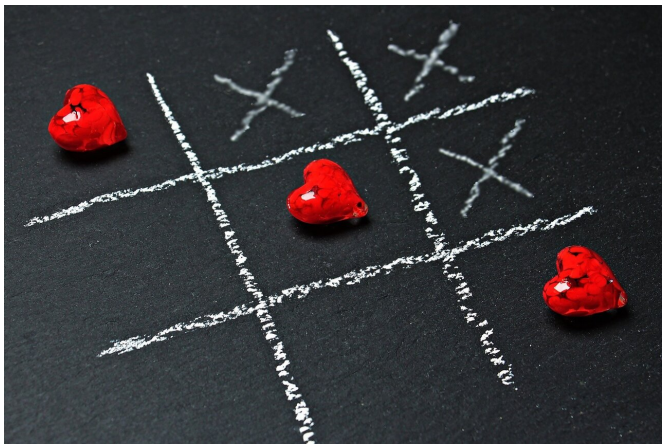

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Children born to mothers who smoked during pregnancy were at increased risk of congenital heart disease, a new study published today [27 May] in the *Journal of the American Heart Association* has found.

The study was led by University of Bristol, in an international collaboration with researchers from seven institutions. It brings together data on more than 230,000 families from seven European birth cohorts from the UK, Ireland, the Netherlands, Denmark, Norway and Italy, including the world-renowned Children of the 90s study at the University of Bristol. The research was supported by the British Heart Foundation and the H2020 program of the European Commission.

Each day, around 13 babies in the UK are diagnosed with congenital heart disease. This means the heart or the large blood vessels surrounding the heart have not developed properly in the womb. Identifying causes of congenital heart disease could help prevent some of these cases and ultimately save lives.

Lead author, Kurt Taylor, a Ph.D. student at the University of Bristol said: "Birth cohorts are unique in that many possess a wealth of data not only in mothers and children, but also in fathers. Crucially, having access to data in the fathers as well as mothers and children allowed us to use a novel study design to investigate possible causes of congenital heart disease."

The study analysed associations between body mass index, smoking, and alcohol consumption on offspring congenital heart disease. Data on these characteristics were obtained through measurements of weight and height and questionnaires administered during early pregnancy when most of the cohorts began recruitment. Measurements were harmonised across cohorts as part of the LifeCycle project; an initiative that aims to research the role of pregnancy and infancy factors on offspring health and wellbeing across childhood and into adulthood. The researchers were able to test the reliability of their findings by using an approach that compares the results from mothers and fathers to help discern whether the effects they see are "real" or are as a result of other factors.

Kurt continued: "Here, we have shown that mothers who smoke during pregnancy are more likely to have a child with congenital heart disease. Our results also suggest that being overweight or obese at the start of pregnancy or consuming alcohol may not be causes of congenital heart disease, despite previous research suggesting otherwise. These results might help in supporting women of reproductive age not to start smoking. Meanwhile it continues to be appropriate to recommend that women, and men, maintain a healthy weight and limit alcohol consumption prior to and during pregnancy."

Professor Deborah Lawlor, British Heart Foundation Chair in Cardiovascular Science and Clinical Epidemiology of the University of Bristol,

who oversaw the study, added: "Smoking rates are declining but remain high in more deprived groups in the UK and other high-income countries and are promoted in low- and middle-income countries. These findings further highlight the need to support smoking cessation globally. Also, if we can work out exactly how maternal smoking increases risk of congenital heart diseases this could identify new ways of preventing these diseases even in the absence of smoking."

Dr. Sonya Babu-Narayan, Associate Medical Director at the British Heart Foundation and cardiologist, said: "Smoking is one of the biggest risk factors for developing heart and circulatory disease. It is also the greatest cause of health inequality across Europe, but supporting people to quit smoking is one of the most effective things we can do to reduce these inequalities. We need to make it easier for everyone to quit by offering them appropriate smoking cessation support and advice."

More information: Kurt Taylor et al, Effect of Maternal Prepregnancy/Early?Pregnancy Body Mass Index and Pregnancy Smoking and Alcohol on Congenital Heart Diseases: A Parental Negative Control Study, *Journal of the American Heart Association* (2021). DOI: 10.1161/JAHA.120.020051

Provided by University of Bristol