

“Mothers’ Anxiety During Pregnancy Is Associated with Asthma in Their Children” (2009), by Hannah Cookson, Raquel Granell, Carol Joinson, Yoav Ben-Shlomo, and A. John Henderson

In 2009, A. John Henderson and colleagues published “Mothers’ Anxiety During Pregnancy Is Associated with Asthma in Their Children,” hereafter, “Mothers’ Anxiety,” in *The Journal of Allergy and Clinical Immunology*. Previous studies had shown that maternal stress during pregnancy affects children’s health during childhood. The researchers explored the association of asthma in children with maternal anxiety during pregnancy. The cause of asthma is often unknown. Thus, the researchers tested the possibility that maternal anxiety may increase disease risk in the children, particularly the development of asthma. The authors reported a positive association between maternal anxiety during pregnancy and asthma in offspring, indicating the possibility of a causal relationship. The authors’ findings demonstrated the health effects of maternal stress during pregnancy on children’s physiological and immune development.

“Mothers’ Anxiety” is a report of the scientific findings of Henderson and his colleagues’ research on the relationship between maternal stress during pregnancy and asthma in their children. Asthma is a condition of the respiratory system marked by lung spasms and difficulties breathing. The authors of the report were Hannah Cookson, Raquel Granell, Carol Joinson, Yoav Ben-Shlomo, and Henderson. The research team worked within the Department of Internal Medicine and the Departments of Social Medicine and Community-Based Medicine at the University of Bristol in Bristol, England. The authors studied within similar fields, including developmental psychology, the genetic origins of diseases, and epidemiology.

The authors divide “Mothers’ Anxiety” into four sections. Beginning in the background section, the researchers describe the reasoning for their hypothesis that increased maternal stress throughout pregnancy could increase the risk of asthma development in children. In the methods section of the article, the authors describe how they measured anxiety in pregnant women and asthma in their children over a period of approximately nine years. In the results section, the authors report finding a positive association between maternal anxiety during pregnancy and asthma in offspring, pointing to the possibility of a causal relationship between the two variables. In the discussion section, they describe some of the implications of their article and make suggestions based off their findings.

In their introduction, the researchers hypothesized that increased maternal stress throughout pregnancy could increase the risk of development of asthma in children. While they had previously associated maternal stress during early childhood with asthma development in children, the authors write that the association had not yet been reported during pregnancy specifically. However, they reasoned that increased levels of the hormone, cortisol, which the human body releases in response to stress, could potentially pass through the placenta and cause health effects for the developing child. Additionally, existing studies indicated that adult mammals exposed to stress during pregnancy had altered immune function and were more likely to experience airway inflammation, a symptom of asthma. However, the authors write that no researchers had performed human studies on the topic.

In the methods section of the article, the researchers describe how they measured anxiety in pregnant women and asthma in their children. The authors report that they conducted the study on a group of pregnant women residing in Avon, England, who delivered children between 1 April

1991 and 31 December 1992. The study consisted of 5810 children. The authors asked women to complete a self-assessed emotional questionnaire at eighteen and thirty-two weeks of pregnancy to measure their anxiety levels. At the eighteenth week of the women's pregnancies, they also measured the partner's anxiety symptoms. The authors report that based on the questionnaires, they placed the women into four groups based on the women's varying levels of anxiety. Additionally, the women completed the same annual questionnaire measuring anxiety until their children were seven years old. The researchers report that they assessed the children for asthma at seven-and-a-half years of age by administering another questionnaire and by taking measurements of the children's airways. They concluded that a child had asthma if there was any report of a doctor's diagnosis, symptoms of wheezing, or any asthma treatment in the past year. For children who had asthma, researchers administered skin prick allergy tests to ensure that the asthma was not allergy-related. In other words, if the asthma was allergy-related, then the researchers did not consider it to be caused by prenatal exposure to maternal stress.

Continuing in the methods section, the authors describe how they measured the possibility of a causal link between maternal stress during pregnancy and asthma in children. Researchers compared the asthma occurrence among seven-and-a-half year-old children who had been exposed to prenatal stress, postnatal stress, or both, compared with seven-and-a-half year-old children without any stress exposure. By comparing those groups, the authors utilized a control to better distinguish if it was the exposure to prenatal stress that accounted for the development of asthma.

In the results section, the authors report that there was a greater likelihood of asthma at seven and a half years of age in children of pregnant women in the higher anxiety level groups compared to the children of pregnant women in the lowest anxiety level group. The authors report a positive association between maternal anxiety during pregnancy and asthma in offspring, pointing to the possibility of a causal relationship between the two variables. A positive association means that as one value goes up, the other goes up, too. The researchers observed a significant connection between children eventually developing asthma and maternal anxiety found during both the eighteenth week and thirty-second week of pregnancy, distinguishing a positive association between the two variables. The connection was greater when the mother experienced anxiety at the thirty-two weeks mark of pregnancy, potentially supporting the idea that psychological disorders, like stress or anxiety, may be even more harmful if they occur during the later stages of pregnancy. 16 percent of the most anxious women's children developed asthma, while only 10 percent of the least anxious women's children did. Therefore, the researchers reported that very anxious women were 60 percent more likely to have a child with asthma than less anxious women.

Continuing in the results section, the researchers report on some additional findings. They write that prenatal and postnatal exposure to stress together was more strongly associated with children's development of asthma than either of those factors alone. In other words, if a pregnant woman was stressed before and after childbirth, the child was more likely to have asthma than if the pregnant woman was stressed only before or only after the child's birth. The authors also report that they found no association between parental anxiety and children's asthma if only the pregnant woman's partner exhibited anxiety. In other words, if only the partner and not the pregnant woman exhibited stress, there was no significant impact on the likelihood of the child developing asthma. However, when both parents had symptoms of anxiety, the effect of asthma in their child was stronger because, according to the researchers, very anxious women are more likely to have anxious partners. They conclude that there is a positive association between maternal anxiety during pregnancy and the development of asthma in children, pointing to the possibility that there may be a causal relationship between the two variables. In other words, there is a possibility that maternal anxiety during pregnancy directly causes the development of asthma in children.

In the discussion section, the authors describe some of the implications of the article. They claim that although the exact mechanisms driving their data are unclear, their findings support the idea that the development of many chronic diseases may originate from early life experiences and events occurring before birth. Therefore, the authors advocate for further studies aimed at understanding such mechanisms so that healthcare professionals may develop prenatal programming techniques aimed at preventing the development of asthma. Prenatal programming is the general hypothesis that the time during pregnancy is a critical period of development and that events occurring during

that time may have permanent effects once the fetus is born and develops into a child. While the authors concede that they do not know enough about the topic to properly implement an intervention, they suggest that women try to reduce anxiety during pregnancy.

By writing "Mothers' Anxiety," Henderson and colleagues aided in helping researchers understand maternal anxiety's effects on developing children. Many researchers studying the various developmental health effects on fetuses and children born to anxious women have cited the article. The authors report that at the time of the article's publication, there was a growing interest in pregnancy as a critical time in child development. Continuously emerging evidence supported the idea that the time during pregnancy was substantially influential in the health and development of the child. With their article, Henderson and colleagues provided data supporting that idea, and enabled researchers to begin thinking about the next step of how the critical time of pregnancy should be treated or modified to prevent future diseases for the developing fetus.

By identifying a positive association between maternal stress during pregnancy and asthma in children, the authors provided evidence that maternal stress affects the health of a developing fetus. In doing such, they have distinguished the significance of maternal psychology in children's health and the prevention of chronic diseases. Specifically, the authors helped identify the importance of the prenatal period in healthy child development and provided groundwork for further research about preventative prenatal interventions.

Sources

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