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# SSRI Use in Pregnancy and Congenital Heart Defects: A Meta-Analysis of Population-Based Cohort Studies

Elizabeth Kowalik

Sponsor: Kristina Ward

The American College of Obstetricians and Gynecologists (ACOG) estimate that 10-23% of pregnant women in the United States face depression at some point during their pregnancy.<sup>1</sup> However, no clear recommendations regarding the treatment of depression in pregnancy are available. The American Psychiatric Association (APA) and ACOG both agree that antidepressant medication safety is uncertain. Antidepressants are commonly used during pregnancy without clear evidence of their safety. The Centers for Disease Control and Prevention (CDC) found that 298 (4.5%) of 6582 women in 10 states between the years of 1998 and 2005 had taken an antidepressant at some time during a pregnancy or up to three months before pregnancy. Of the women, 250 (3.8%) used a selective serotonin reuptake inhibitor (SSRI) making them the most commonly used type of antidepressant in pregnancy.<sup>2</sup> A major concern with SSRI use during pregnancy is the potential risk for congenital malformations, including congenital heart defects (CHD), which are the most common type of birth defect in the United States. The purpose of the meta-analysis was to determine if risk of CHD is associated with the use of SSRIs during pregnancy.

The biomedical literature was searched extensively. The systematic search involved three databases: PubMed, EMBASE, and Cochrane Database. Over one-thousand articles were reviewed following the searches. Studies were narrowed based on a variety of inclusion and exclusion criteria. Following exclusion, eight studies were selected for further analysis. The outcome measured in this analysis was the presence of CHDs in children. The analysis was conducted using R studio with the metafor package. A random effects model was utilized and odds ratio and confidence intervals calculated for each study along with an overall pooled risk. The studies included in the meta-analysis were also evaluated for heterogeneity using  $I^2$  and Cochran's  $Q$ .

The results of the analysis showed a significant association between the use of SSRIs in pregnancy and the development of CHD in children. The overall result was associated with significant heterogeneity. Our meta-analysis shows that risk of CHD may be increased when SSRIs are used during pregnancy. The potential risk of CHD should be considered in the risk-benefit discussion when initiating SSRI therapy in pregnant women or women of child-bearing age. However, the meta-analysis results show that use of SSRIs in pregnancy is not benign. While the overall increased risk of CHDs is low, risk should be considered by providers and discussed with women before initiating therapy.

I learned a lot about the research process throughout this project and it has been extremely rewarding. I gained a new appreciation for meta-analyses. The literature review process was very extensive and time consuming, but now I feel very competent in reviewing literature and determining quality of studies. It was valuable to see how to tailor database searches to obtain the best results for research. I learned an entirely new skill in using a computer program where I had to learn how to program code. This part was the most challenging part of this process as it was like learning a new language. However, now I can use this program in future research. This project allowed me to explore

my own research and own every step of the process. Moving forward I feel confident in my ability to conduct research of my own design.

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