



ORIGINAL ARTICLE

Maternal depression and anxiety and fetal/neonatal growth[☆]

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KEYWORDS

Maternal depression;
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Abstract

Objective: Maternal depression and anxiety have been found to negatively affect fetal and neonatal growth. However, the independent effects of maternal depression and anxiety on fetal/neonatal growth outcomes and trajectories remain unclear. This study aimed to analyze simultaneously the effects of maternal prenatal depression and anxiety on (1) neonatal growth outcomes, and (2), on fetal/neonatal growth trajectories, from the 2nd trimester of pregnancy to childbirth.

Methods: A sample of 172 women was recruited and completed self-reported measures of depression and anxiety during the 2nd and 3rd trimesters of pregnancy, and at childbirth. Fetal and neonatal biometrical data were collected from clinical reports at the same assessment moments.

Results: Neonates of prenatally anxious mothers showed lower weight ($p=0.006$), length ($p=0.025$), and ponderal index ($p=0.049$) at birth than neonates of prenatally non-anxious mothers. Moreover, fetuses and neonates of high-anxiety mothers showed a lower increase of weight from the 2nd trimester of pregnancy to childbirth than fetuses and neonates of low-anxiety mothers ($p<0.001$). Considering maternal depression and anxiety simultaneously, only the effect of maternal anxiety was found on these markers of fetal/neonatal growth outcomes and trajectories.

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PALAVRAS-CHAVE

Depressão maternal;
Ansiedade maternal;
Resultados de
crescimento fetal e
neonatal;
Trajetórias de
crescimento fetal e
neonatal

Conclusion: This study demonstrates the independent longitudinal effect of maternal anxiety on major markers of fetal/neonatal growth outcomes and trajectories, simultaneously considering the effect of maternal depression and anxiety.

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Depressão e ansiedade maternal e crescimento fetal-neonatal**Resumo**

Objetivo: Foi constatado que a depressão e ansiedade materna afetam negativamente o crescimento fetal e neonatal. Contudo, o efeito independente da depressão e ansiedade materna sobre os resultados e as trajetórias de crescimento fetal e neonatal continua incerto. Este estudo visou analisar simultaneamente o efeito da depressão e ansiedade materna pré-natal (1) sobre os resultados de crescimento neonatal e (2) sobre as trajetórias do crescimento fetal-neonatal a partir do 2º trimestre de gravidez até o parto.

Métodos: Uma amostra de 172 mulheres foi recrutada e as mesmas relataram graus de depressão e ansiedade no 2º e 3º trimestre de gravidez e parto. Os dados biométricos fetais e neonatais foram coletados dos prontuários clínicos nas mesmas ondas de avaliação.

Resultados: Os neonatos de mães ansiosas no período pré-natal mostraram menor peso ($p = 0.006$), comprimento ($p = 0.025$) e índice ponderal ($p = 0.049$) no nascimento que os neonatos de mães não ansiosas no período pré-natal. Além disso, os neonatos de mães muito ansiosas mostraram um menor aumento de peso do 2º trimestre de gravidez até o parto que os fetos-neonatos de mães pouco ansiosas ($p < 0.001$). Considerando simultaneamente a depressão e a ansiedade maternal, apenas o efeito da ansiedade materna foi constatado nesses marcadores de resultados e trajetórias de crescimento fetal-neonatal.

Conclusão: Este estudo demonstra o efeito longitudinal independente da ansiedade materna sobre os principais marcadores de resultados e trajetórias de crescimento fetal-neonatal, considerando simultaneamente o efeito da depressão e ansiedade materna.

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Introduction

The short-term consequences of prenatal depression and anxiety on pregnant women's physical health include obstetric complications and physical symptoms, which are both associated with lower fetal and neonatal growth and lower autonomic nervous system (ANS) maturation.^{1,2} Depression and anxiety share a common genetic pathway, and often appear simultaneously, making it difficult to assess their independent effects. Thus, when analyzing the effects of maternal depression and anxiety, it may be important to consider both simultaneously, in order to control their mutual effects and to better identify the independent effect of each.³

Various studies have found similar effects of maternal prenatal depression and anxiety on fetal growth, behavior, and ANS maturation. Both fetuses of depressed and anxious mothers were found to present lower estimated weight and higher total fetal activity.⁴⁻⁶ In addition, studies have found that both fetuses of depressed and anxious mothers show higher heart rate reactivity compared with fetuses of non-depressed or non-anxious mothers.⁷⁻¹⁰

Moreover, studies also have found similar effects of maternal prenatal depression and anxiety on neonatal growth, behavioral, and maturation outcomes. Both

neonates of prenatally depressed and anxious mothers presented higher risk of premature birth and low weight, both major problems of infant health.¹¹⁻¹³ Neonates of depressed and anxious mothers were found to present disorganized sleep patterns and frequent changes of mood.² Lower maturation was also found in neonates of prenatally depressed and anxious mothers, including less vagal tonus, and lower neurobehavioral maturity.^{2,11,13,14} Furthermore, both neonates of prenatally depressed and anxious mothers were found to show higher levels of cortisol and lower levels of dopamine and serotonin when compared with hormonal levels of neonates of prenatally non-depressed or non-anxious mothers.¹⁵ Other studies also reported that both infants of prenatally depressed and anxious mothers present increased admission rates to the neonatal care unit and growth retardation during the first year of life.^{16,17}

Few studies have simultaneously considered maternal depression and anxiety when analyzing the effect on fetal/neonatal growth and behavior. When simultaneously considering maternal depression and anxiety, studies only found an independent effect of maternal anxiety on fetal/neonatal growth and behavior.¹⁸⁻²⁰ One cross-sectional study only found an effect of maternal anxiety on fetal growth and behavior (fetuses of anxious mothers presented lower estimated weight and higher

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