



Associations between prenatal maternal psychological distress, brain growth, and behaviour in young children

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A vast scientific literature links exposure to chronic stress in adulthood with increased risk for mental illness and chronic disease. However, considerably less research has examined the long-term impacts of prenatal stress exposure on neurodevelopment and early childhood behaviour. A recently funded study by Dr. Catherine Lebel and colleagues therefore seeks to advance our understanding of this issue, particularly as it relates to the COVID-19 pandemic.

Since March 2020, the pandemic has imposed global changes to socialization and physical activity. These lifestyle changes, in addition to others, have increased the likelihood of experiencing psychopathological symptoms that often accompany stress, anxiety, and depression. Due to the mass effect on many individuals, the pandemic has provided a natural environment for Drs. Lebel (University of Calgary), Emma Duerden (Western), and Timothy Oberlander (University of British Columbia) to study the effects of prenatal stress. For this project, participants will be recruited from the “Pregnancy during the COVID-19 Pandemic” study and pregnant individuals along with their infants will be followed over a four-year period. During this time, the investigators plan to utilize magnetic resonance imaging (MRI) to explore the following: 1) the associations between prenatal distress and child brain function and structure; 2) how prenatal distress influences early childhood brain development; and 3) the relationship between brain structure/function and childhood behaviour. They also plan to explore whether child sex or a child’s post-natal environment exerts any effect on associations between prenatal maternal distress and child brain structure and function at ages 2, 3, and 4.

The researchers hope that a systematic study of prenatal psychological stress on children’s development will clarify how these developmental changes



Catherine Lebel, PhD



occur and what type of resources could be provided to children to facilitate their growth, both anatomically and cognitively. Says Dr. Lebel: "Are there more kids at risk of behaviour problems and/or developmental delays due to the pandemic? This [study] could also help advocate for more resources. For example, if more kids are at risk, then schools, preschools, etc. need more funding and supports to help children and families." The results of this study could also help physicians, child psychologists, and therapists to create a more thorough patient profile that is inclusive of prenatal and postnatal factors – aspects that are not commonly included due to a lack of data. Future projects aim to continue following the parents involved in this study, their mental health trajectories, and the role of their partners so that further support and intervention can be made available for future stressful events.

Study investigators plan to utilize magnetic resonance imaging to explore the associations between prenatal distress and child brain function and structure at two years of age, how prenatal distress influences early childhood brain development, and the relationship between brain structure/ function and childhood behaviour.



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