



Prenatal maternal distress tied to fetal brain impairments (Feb. 6, 2020)

NEW YORK (Reuters Health) - Prenatal psychological distress is associated with impaired fetal brain chemistry and structural brain growth, an observational study suggests.

"When pregnant women visit their care providers, much of the attention is paid to the developing fetus and the expectant mother's physical health," Dr. Catherine Limperopoulos, Director of the Center for the Developing Brain at Children's National Hospital in Washington D.C., told Reuters Health by email.

"Our findings underscore the importance of clinicians also focusing on the mother's psychological well-being, for her benefit as well as for the benefit of the developing fetal brain," she said. "The good news is, validated screening tools already exist for clinicians ready to take that next step."

The researchers recruited healthy pregnant women from low-risk ob-

stetric clinics in Washington, D.C. from 2016-2019. Participants had normal prenatal medical histories and normal results on fetal ultrasonography and biometry studies. All were high school graduates, 83% were college graduates, and 84% reported professional employment.

Fetal brain MRI studies were performed twice between gestational weeks 24 and 40. Maternal stress, depression, and anxiety were measured with the Perceived Stress Scale (PSS), Edinburgh Postnatal Depression Scale (EPDS), Spielberger State Anxiety Inventory (SSAI), and Spielberger Trait Anxiety Inventory (STAI).

Altogether, as reported in JAMA Network Open, 193 MRI studies were performed in 119 pregnant women with a mean age of 34; 56% were carrying male fetuses and 44%, females. Thirty-two women (27%) had positive scores for stress; 26%, for anxiety; and 11%, for depression. Maternal anxiety was associated with a smaller fetal left hippocampal volume (STAI score: -0.002 cm³). Anxiety and stress were associated with increased fetal cortical gyrification in the frontal and temporal lobes, whereas elevated maternal depression was associated with decreased creatine (EPDS score: -0.04) and choline (EPDS score: -0.03) levels in the fetal brain.

The authors conclude, "The prevalence of maternal psychological distress in healthy, well-educated, and employed pregnant women was high, underappreciated, and associated

with impaired fetal brain biochemistry and hippocampal growth as well as accelerated cortical folding. These findings appear to support the need for routine mental health surveillance for all pregnant women and targeted interventions in women with elevated psychological distress."

Dr. Limperopoulos said, "Additional studies are needed to not only to confirm our results but also to determine what is causing such high levels of anxiety, stress and depression for certain women; what helps other women in the same circumstances remain resilient; and at what point during pregnancy - or even as couples consider childbirth - we can make the most meaningful interventions to safeguard fetal brain health and maternal mental health."

"Our primary mission is to identify early biomarkers of risk so that we can intervene at the earliest possible moment to prevent harm to the developing fetus," she added. "Why wait until after childbirth, especially for infants with underlying congenital conditions that could impact brain development?" "We have funding to continue monitoring the neurodevelopmental outcomes of these children at 18 months, at preschool years and beyond," she said. "We are seeing signals of delays in developmental milestones, but these data are preliminary."

Dr. Charles Nelson III of Boston Children's Hospital and Harvard Medical School in Massachusetts, author of a related editorial, commented in

an email to Reuters Health, "There is mounting evidence that early postnatal exposure to stressful life events can alter the trajectory of both brain and behavioral development."

"However, this study adds important new information about exposure to prenatal stress," he said. "Here, the authors demonstrate changes in brain morphology and chemistry in third trimester fetuses whose mothers experienced elevations in psychological distress. If it can be demonstrated in future work that there are functional correlates of such changes - i.e., changes in behavior - it behooves us to revisit how we define 'early' intervention."

"Indeed, these findings suggest we should not wait till birth to intervene but rather, we should start before birth to reduce maternal stress and/or provide treatment to pregnant woman who are experiencing elevations in anxiety and depression," he concluded.

SOURCE: <http://bit.ly/31xwUxj> and <http://bit.ly/385G071> JAMA Network Open, online Jan. 29, 2020.

- By Marilyn Larkin