Too much caffeine during pregnancy may damage baby's liver

July 24 2019

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Having too much caffeine during pregnancy may impair baby's liver development and increase the risk of liver disease in adulthood, according to a study published in the *Journal of Endocrinology*. Pregnant

rats given caffeine had offspring with lower birth weights, altered growth and stress hormone levels and impaired liver development. The study findings indicate that consumption of caffeine equivalent to 2-3 cups of coffee may alter stress and growth hormone levels in a manner that can impair growth and development, and increase the risk of liver disease in adulthood.

Previous studies have indicated that prenatal caffeine intake of 300 mg/day or more in women, which is approximately 2 to 3 cups coffee per day, can result in lower birth weights of their children. Animal studies have further suggested that prenatal caffeine consumption may have more detrimental long-term effects on liver development with an increased susceptibility to non-alcoholic fatty liver disease, a debilitating condition normally associated with obesity and diabetes. However, the underlying link between prenatal caffeine exposure and impaired liver development remains poorly understood. A better understanding of how caffeine mediates these effects could help prevent these health issues in people in the future.

In this study, Prof Hui Wang and colleagues at Wuhan University in China, investigated the effects of low (equivalent to 2-3 cups of coffee) and high doses (equivalent of 6-9 cups of coffee) caffeine, given to pregnant rats, on liver function and hormone levels of their offspring. Offspring exposed to prenatal caffeine had lower levels of the liver hormone, insulin like growth factor (IGF-1), and higher levels of the stress hormone, corticosteroid at birth. However, liver development after birth showed a compensatory 'catch up' phase, characterised by increased levels of IGF-1, which is important for growth.

Dr. Yinxian Wen, study co-author, says, "Our results indicate that prenatal caffeine causes an excess of stress hormone activity in the mother, which inhibits IGF-1 activity for liver development before birth. However, compensatory mechanisms do occur after birth to accelerate

growth and restore normal liver function, as IGF-1 activity increases and stress hormone signalling decreases. The increased risk of fatty liver disease caused by prenatal caffeine exposure is most likely a consequence of this enhanced, compensatory postnatal IGF-1 activity."

These findings not only confirm that prenatal caffeine exposure leads to lower birth weight and impaired liver development before birth but also expand our current understanding of the hormonal changes underlying these changes and suggest the potential mechanism for increased risk of liver disease in the future. However, these animal findings need to be confirmed in humans.

Dr. Wen comments, "Our work suggests that prenatal caffeine is not good for babies and although these findings still need to be confirmed in people, I would recommend that women avoid caffeine during pregnancy."

Provided by Society for Endocrinology

Citation: Too much caffeine during pregnancy may damage baby's liver (2019, July 24) retrieved 24 April 2024 from https://medicalxpress.com/news/2019-07-caffeine-pregnancy-baby-liver.html

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