

Males born to obese mothers more likely to suffer health issues as adults, study finds

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Males born to obese women are more likely to be overweight at birth and develop metabolic complications in later life, including liver disease and diabetes. The way that male sex hormones activate pathways in the

developing liver is partly to blame.

That's the finding from a [new study](#) led by University of South Australia (UniSA) researchers looking at the impact of maternal obesity on fetal liver androgen signaling. The findings are published in the journal *Life Sciences*.

Male fetuses of obese pregnant women have different signals that are activated by [male sex hormones](#) in the liver, which encourages them to prioritize growth at the expense of their health.

UniSA researcher Dr. Ashley Meakin says androgens give men their male characteristics and are crucial in their development, but if there are too many, [male fetuses](#) grow too large, causing not only problems at birth, but impacting liver function as an adult.

Female fetuses exposed to excess testosterone from an obese [pregnancy](#) are wired to switch off the androgen pathway in the liver, restricting their growth and lowering the risks of metabolic disorders in adulthood.

"We know there are sex differences in metabolic disorders in later life in response to maternal obesity," Dr. Meakin says.

"Men are more prone to non-alcohol fatty liver diseases and diabetes as an adult if their mother is obese during pregnancy and their birth weight is above 4 kg.

"They are genetically wired to prioritize androgens because it supports the development of male characteristics—including size—but too much androgen is bad."

Study lead author Professor Janna Morrison, Head of the Early Origins of Adult Health Research Group at UniSA, says it's a fine balance for

women getting the right nutrition in pregnancy to ensure optimal conditions for their [unborn child](#) to flourish.

"There are also risks for offspring being malnourished during pregnancy," she says. "If you are too little, too big, born too early, or a male, you are more vulnerable to negative outcomes later in life. You need the Goldilocks pregnancy: you must be the right size, born at the right time."

Prof Morrison says unless society changes its approach to nutrition, it will be an uphill battle to reduce obesity and associated health issues, from the womb into adulthood.

"As a society, we urgently need to address obesity. If children were taught early on about the importance of healthy eating, it would carry through into adulthood, including during pregnancy, where the right nutrition is so important."

Dr. Meakin says in the intervening period, supplements that address nutritional imbalances in pregnancy could provide the fetus with the best chance of optimal development.

This liver androgen signaling study is among a series of studies by Prof Morrison and colleagues that investigate the impact of maternal under- and over-nutrition on the placenta, heart, lung, and liver.

The paper, "Maternal obesity impacts fetal liver [androgen](#) signaling in a sex-specific manner," is authored by researchers from the University of South Australia, University of Wyoming and the University of Queensland. In this study, [tissue samples](#) were obtained from the fetuses of obese pregnant baboons housed at the Texas Biomedical Research Institute in the United States. Cesarean sections were undertaken at 165 days.

More information: Ashley S. Meakin et al, Maternal obesity impacts fetal liver androgen signalling in a sex-specific manner, *Life Sciences* (2023). [DOI: 10.1016/j.lfs.2023.122344](https://doi.org/10.1016/j.lfs.2023.122344)

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