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Phonetic spelling of your (full) name

Sri-yaa-ni Ra-na-tu-n-ga

Presenting Author Category

PhD Student

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GBD Audio File

Dr. GoodBear's Den_Sriyani.m4a

Headshot

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Short Bio (100 words)

I am Sriyani, a 2nd year PhD student at Pascoe lab. I graduated with my masters degree from the same lab in 2024. Then started my journey as a PhD student. My research focus is how in-utero and early life exposure effects on children's lung health later in their life. Outside of academia I enjoy camping, Kayaking and crocheting is one of my favorite ways to relax and be creative.

Research Category

Basic Science

Abstract Title

Maternal Metformin Treatment During Pregnancy Induces Airway Hyperresponsiveness in Offspring

Authors

Name	Role	Profession
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Background

Diabetes during pregnancy, specifically diabetes requiring treatment, is associated with increased risk of childhood asthma, and the prevalence of maternal diabetes has significantly increased over the last

decade. Metformin is the most widely prescribed oral glucose lowering medication in diabetic pregnancies. Even though metformin can cross the placental barrier, its impact on lung health in offspring remains poorly understood.

Objective

To evaluate the effects of maternal metformin during pregnancy on offspring airway reactivity.

Methods

Six-week-old female C57BL/6NJ mice were fed either a high-fat-diet (45% kcal) to induce diabetes or a low-fat-control diet (10% kcal) for six weeks before mating and throughout pregnancy and weaning. A subset of diabetic dams received metformin (350 mg/kg/day) orally from embryonic day-0.5 until one-week after delivery. Offspring were weaned onto a standard-chow-diet until eight-weeks of age, when lungs were prepared for assessment of airway narrowing to methacholine using precision-cut lung slices (PCLS) (PhysioLENS).

Results

High-fat-diet induced significant weight gain and glucose intolerance in the mothers and daily metformin supplementation improved glucose homeostasis during gestation. 3-week-old male and female offspring from diabetic pregnancies were significantly heavier than controls (males +3.3g; females +2.5g). This difference was reduced, but not significantly, by metformin treatment in males (+1.9g). In males, but not females, the difference in body weight persisted at 8-weeks of age. Methacholine induced a concentration-dependent constriction of airways in PCLS, as expected. Maximal methacholine-induced narrowing was significantly higher in offspring from metformin-exposed dams (51.1%) compared to both control (30.7%) or diabetic (31.4%) offspring, independent of airway size. There was no difference in sensitivity to methacholine between groups.

Conclusion

Metformin treatment during pregnancy increases airway reactivity in offspring, like what is seen in asthma. This suggests the link between maternal diabetes and asthma may be driven by the treatment rather than the condition itself.