CHRD 2022: Abstract & Poster Submission Form

Submitter Name

Marcelo Ninalaya

Submitter Email

ninalaym@myumanitoba.ca

Presenter Status

- ○ Undergraduate Students
- ◉ Masters Student
- ○ PhD Student
- ○ Post-Doctoral Fellows
- ○ Residents
- ○ Non-Trainee

Research Category

- ◉ Basic Science
- ○ Clinical
- ○ Community Health / Policy

Role in the project

- ☑ Design
- ☑ Perform Experiments
- ☑ Analyze Data
- ☑ Write Abstract
- ☐

Title

Maternal RESV Supplementation and the Effects on Mitochondrial Metabolism and Calcium Transport in Neonatal Cardiomyocytes

Background

Gestational Diabetes Mellitus (GDM) is a metabolic condition that occurs in 3-20% of pregnancies. Current GDM treatment strategies include diet, exercise or insulin therapy, but can be ineffective or carry the risk of adverse pregnancy outcomes. Previous studies from the Dolinsky lab have found RESV, a polyphenolic molecule found in fruits and vegetables, to potentially be a safe treatment for GDM.

Objective

We hypothesize that maternal RESV supplementation will mitigate GDM-induced mitochondrial dysfunction in primary cardiomyocytes. We further hypothesize that maternal RESV treatment can improve GDM-induced impairments in calcium transport and cardiac hypertrophy.

Methods

Female rats were fed a low fed a low fat (Lean) (10% kcal fat) or high fat and sucrose (GDM) (45% kcal fat) diet 6 weeks prior to mating to induce GDM. A subgroup of GDM dams were switched to a supplemented diet with RESV (GDM+RESV) (45% kcal + 4g/kg diet RESV) for the final week of pregnancy, after hyperglycemia and glucose intolerance is apparent. To determine the effects of RESV on the cardiovascular system of GDM-offspring, e.20 pups were sacrificed for cardiomyocyte isolation. Mito-stress and glycolysis stress assays were preformed on isolated cardiomyocytes (n=1 litter) to measure oxygen consumption rate (OCR) and extracellular acidification rate (ECAR) respectively. In utero echocardiography was performed on fetal offspring to assess cardiac structure and function.

Results

When comparing mitochondrial capacity, GDM-offsprings expressed lower levels of ATP production and maximal respiratory capacity (24% and 20% respectively) in cardiomyocytes from GDM offspring compared to lean offspring. Preliminary analysis found that maternal RESV supplementation attenuated the impaired mitochondrial respiration in GDM+RESV offspring cardiomyocytes. Echocardiography revealed that GDM+RESV attenuated GDM-induced cardiac hypertrophy in neonate.

Conclusion

Initial findings suggest that maternal RESV supplementation attenuated GDM-induced impairments of cardiomyocyte mitochondrial respiration and cardiac hypertrophy in the offspring.

Do you have a table/figure to upload?

○ Yes ⊙ No

Authors

- For each author, please click "**[+] Add Item**" and provide the author's information

Name	Email	Role	Profession
Marcelo Ninalaya	ninalaym@myumanitoba.ca	Presenting Author	Graduate

Gabriel Brawerman	gbrawerman@chrim.ca	Co Author	Graduate
Mateusz Tomczyk	tomczyk3@myumanitoba.ca	Co Author	Graduate
Bo Xiang	bo.xiang@umanitoba.ca	Co Author	Other
Stephanie Kereliuk	umkereli@myumanitoba.ca	Co Author	Graduate
Vernon Dolinsky	vdolinsky@chrim.ca	Co Author	Associate Professor