THE INFLUENCE OF MATERNAL EXERCISE ON HEALTH DISPARITIES AND BIRTH OUTCOMES

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INTRODUCTION

- African American (AA) women have higher rates of premature birth and low birthweight.
- This disparity directly causes the children to have a poorer status of health at birth which precedes other health issues in life.
- Studies show women who exercise during gestation improve the health of their baby.

QUESTION & PURPOSE

- Does exposure to exercise decrease the likelihood of premature birth and low birthweight among African American women?
- The purpose of this study was to evaluate if supervised exercise training during gestation have similar birth outcome measures in AA and Caucasian infants.

MATERIALS & METHODS

Participants

- Healthy pregnant women between 18-40 years old were recruited at ≤16 weeks of gestation
- Inclusion criteria
  - Letter of clearance to participate in physical activity from physician
  - BMI between 18.5-34.9
  - No use of alcohol, tobacco or recreational drugs
  - No pre-existing diabetes, hypertension, or cardiovascular diseases
- Randomly assigned to 3 groups:
  - Resistance Only: strength training
  - Aerobic and Resistance: circuit training
  - Aerobic Only: treadmill, stationary bicycle, or elliptical
- Participated in 150 minutes/week of moderate intensity exercise from 16 weeks until delivery

MATERIALS & METHODS CONTINUED

Participants cont.

- 121 participants enrolled between July 2013 and January 2019.
- Number of participants randomized to each exercise group:
  - Control: 57
  - Aerobic: 64

Data Collection

- Demographics from survey: age, pre-pregnancy BMI, race
- Birth measures from medical record: gestational age, birth weight

RESULTS

Maternal Demographics

Race	Exercise	Number	Mean Age (Years)	Mean BMI	Mean Gestational Age (Weeks)
African American	No	13	29.08±5.38	*29.76±5.95	38.8±2.04
	Yes	12	30.92±5.84	*27.01±5.20	38.5±2.93
Caucasian	No	44	29.79±3.73	*26.00±5.68	39.1±1.74
	Yes	52	30.51±3.64	*24.10±4.33	39.4±1.70

Table 1. Maternal Demographics
All women were healthy with no pregnancy complications. 121 participants were enrolled but ultimately randomized 64 participants to the aerobic exercise group. Neonates born to AA women had a lower gestational age than those born to Caucasian women, regardless of exercise group. Similarities in mean age were expected due to inclusion criteria. There was a significant difference in pre-pregnancy BMI between AA and Caucasian women (*p<0.05).

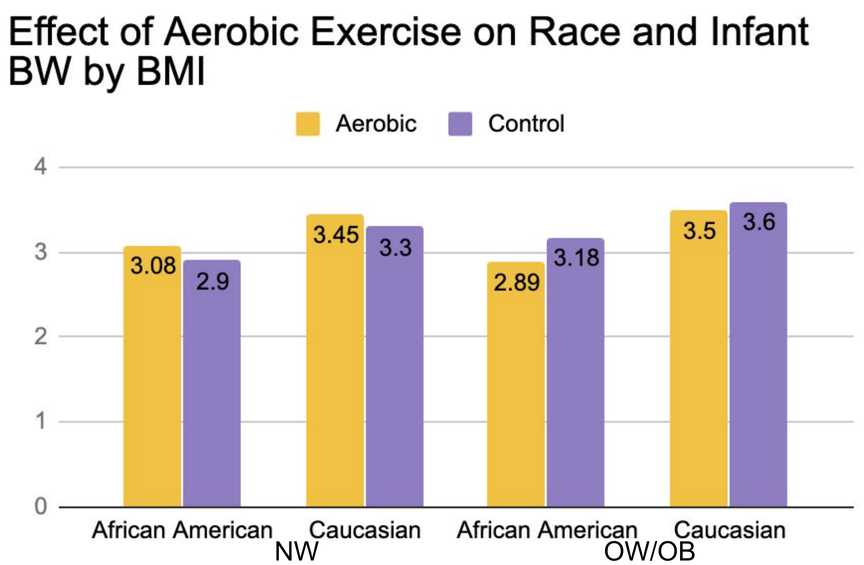

Figure 1. Effect of Aerobic Exercise on Race and Infant Birthweight by Maternal BMI
Participants enrolled had a BMI between 18.5-34.9. An normal BMI is considered 18.5-24.9. An overweight BMI is considered 25-29.9 and an obese BMI is considered 30 or above. For the purpose of this analysis, overweight and obese were grouped together. The numbers reported are average birthweight in kilograms and a healthy range is 2.5-4.0kg.

RESULTS CONTINUED

Exercise by Prematurity Stratified by Race

Exercise	Prematurity- African American			Prematurity- Caucasian		
	No	Yes	Total Percent	No	Yes	Total Percent
No	12	1	52%	39	5	45.83%
Yes	9	3	48%	49	3	54.17%
Total Percent	84%	16%	_	91.67%	8.33%	_

Table 2. Exercise by Prematurity Stratified by Race
The total amount of AA women analyzed was 25 (12 exercisers, 13 control). The total amount of Caucasian women analyzed was 96 (52 exercisers, 44 control). There were 4 premature births in the group of AA women and 8 premature births in the group of Caucasian women. 16% of AA women had premature births out of 25 women, but this is not significant enough to predict outcomes for a general population.

DISCUSSION

- On average, neonates born to AA women with normal BMI had a lower birthweight by approximately 0.5 kilograms.
- 16% of the AA women who participated in the study gave birth prematurely.
- Women who were of a normal weight had infants that also had a healthy weight, regardless of race.
- Limitations:
  - The number of AA participants
  - Dosage of exercise based on the regularity participants attended training sessions
- Conclusions:
  - Exposure to exercise does not directly impact birth weight or likelihood of prematurity in a negative or positive way.
  - It does not confirm that exercise during gestation alone is able to significantly reduce AA chance of prematurity or low birth weight outcomes.
- Future work:
  - Recruit more AA women to support this research and draw more extensive conclusions.
  - Further research with more accurate biomarkers is required to understand the influence on birth outcomes and long term effects on the children.

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