The Pediatric Metabolic Syndrome Study: Racial Disparities in Cardiometabolic Risk

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Disclosures

• The authors have no financial relationships to disclose
Background

• Racial and ethnic health disparities have become predominant concerns in healthcare

• From the American College of Cardiology:
  
  “We must be cognizant of health care disparities and take proactive steps to narrow and eventually eliminate gaps in care as a function of race and ethnicity as well as other factors such as sex and age.”
Incidence of MI by Age, Race, Sex

Prevalence trends for high blood pressure in adults

Prevalence of obesity of boys aged 12-19 years

http://www.cdc.gov/nchs/data/hestat/obesity_child_07_08/obesity_child_07_08.pdf
Prevalence of obesity of girls aged 12-19 years

http://www.cdc.gov/nchs/data/hestat/obesity_child_07_08/obesity_child_07_08.pdf
Aims

• Primary: Assess for gender and racial disparities in the fasting insulin levels of obese children

• Secondary: Assess for gender and racial disparities in other proposed metabolic and physiologic traits of the pediatric metabolic syndrome

• We hypothesized that markers of early cardiovascular disease would be more abnormal in blacks and males than in whites and females.
Methods

- Cross-sectional study
- Obese subjects ages 4 to 21 were recruited prospectively
- Goal enrollment: 240
- All tests were conducted during a single assessment using a standardized protocol.
- Subjects who were pregnant, taking insulin, or on chronic oral steroids were excluded.
Methods

• Body mass index
• Anthropometrics
• Blood pressure
• Glucose
• Insulin
• Carotid intima-media thickness
Methods

- Lipoproteins and related subclasses
- Body composition via BodPod
- Body composition via DEXA
- High-sensitivity c-reactive protein
Results

- 127 subjects
- 46 (36%) white
  - 72% female
- 74 (58%) black
  - 64% female
- 7 (6%) Hispanic or mixed race/ethnicity
## Results

<table>
<thead>
<tr>
<th></th>
<th>White</th>
<th>Black</th>
<th>p-value</th>
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<tbody>
<tr>
<td><strong>Age (yr)</strong></td>
<td>12.5</td>
<td>11.8</td>
<td>0.30</td>
</tr>
<tr>
<td><strong>Height (cm)</strong></td>
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### BMI (kg/m^2)

- **White**: 31.2
- **Black**: 35.3

p = 0.01

**Body Mass Index**

- White
- Black
Results

\[ p = 0.93 \]

**Bod Pod**

- White: 42%
- Black: 42%

\[ p = 0.60 \]

**DEXA**

- White: 41%
- Black: 41%
Results

**Insulin**

- White: 29
- Black: 35

$p = 0.17$

**Glucose**

- White: 91
- Black: 92

$p = 0.53$
Results

**Glucose:Insulin**

- White: 47
- Black: 34

*p < 0.01*

**QUICKI**

- White: 0.3
- Black: 0.29

*p = 0.02*
Results

Systolic Blood Pressure

- White: 113
- Black: 112

Diastolic Blood Pressure

- White: 63
- Black: 61

For Systolic Blood Pressure, the p-value is 0.63.

For Diastolic Blood Pressure, the p-value is 0.15.
Results

Lipoprotein Subclasses

LDL (mg/dL)  
White: 103  
Black: 104  
p = 0.73

HDL (mg/dL)  
White: 41  
Black: 42  
p = 0.49

Triglycerides (mg/dL)  
White: 112  
Black: 68  
p < 0.01
Results

Mean cIMT

- White: 0.43
- Black: 0.45
Results

p < 0.01

Mean cIMT

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### Results

**Mean cIMT**

- **p < 0.01**
  - White: 0.43
  - Black: 0.45

**hsCRP**

- **p = 0.01**
  - White: 0.35
  - Black: 0.56
Conclusion

• We found no significant differences between males and females
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• BMI and % body fat do not correlate similarly between white and black patients
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• We found no significant differences between males and females

• BMI and % body fat do not correlate similarly between white and black patients

• Despite significantly lower triglyceride levels, black subjects demonstrated increased insulin resistance, higher inflammatory markers, and greater cIMTs, suggesting increased cardiometabolic risk compared to white subjects.
Collaborative Opportunities

- At this time we have enrolled well over 200 patients
- We have frozen, coded fasting plasma and serum samples stored in the CTRC
- We have ongoing access to this population through our clinic for people interested in future collaborations
  - NIH Pediatric Heart Network dyslipidemia study
Questions?

• The Pediatric Metabolic Syndrome Study (CTRC 0863) is supported by the SCTR Institute at MUSC, NIH/NCRR RR029882.

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