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## Diabetes & Glucose Metabolism

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### ***Relationship Of Shape Of Glucose OGTT Curves With Measures Of Cardiometabolic Health In African American Adolescents***

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**Background and Aims:** Studies in youth and adults have shown that the shape of oral glucose tolerance test (OGTT) response curve may be a biomarker for insulin secretion and insulin sensitivity (IS). Individuals with monophasic (MPh) glucose response curve have lower IS and decreased beta-cell function compared to those with biphasic (BPh) pattern. The aim of this study was to assess if the shape of the glucose response curve of OGTT is associated with 2-D ECHO based indices of heart structure and function. **Methods:** In a cross-sectional study, African American (AA) adolescents with and without obesity between the ages of 13-18 years were recruited to assess the relationship of blood pressure, obesity, and measures of cardiac health. Metabolic and inflammatory markers, 2-D ECHO and OGTT data were collected. The shape of the OGTT glucose response was classified based on a change from nadir to glucose-120 min of  $\geq 4.5$  mg/dL, and its association with cardiac health indices was calculated. R v.4.1.2 was used for analysis. **Results:** Of the 276 individuals with available OGTT data (mean age  $16.18 \pm 1.70$  years, 47.5% females), 39 (14.1%) had BPh curve. The individuals with BPh were lower in age ( $15.61 \pm 1.68$  vs  $16.28 \pm 1.68$ ,  $p=0.02$ ), but similar in sex, BMI, BMIz and metabolic parameters. There was no difference in impaired glucose tolerance (27% [BPh] vs 15% [MPh],  $p=.08$ ). At 120 min, glucose ( $6.96 \pm 0.07$  vs  $6.31 \pm 0.07$  mmol/L,  $p=.05$ ), and insulin ( $362.86 \pm 13.69$  vs  $276.48 \pm 13.61$  uIU/mL,  $p=.04$ ) levels were higher in BPh. The glucose area under the curve (AUC) was lower in individuals with BPh ( $13.2 \pm 1.23$  vs  $14.7 \pm 1.16$  mmol/L/hr,  $p < .001$ ) while the insulinogenic index ( $1.5 \pm 3.79$  vs  $1.17 \pm 2.74$ ,  $p=.03$ ) and oral glucose disposition index were higher in both univariate analyses and after adjusting for age, sex and BMIz. The aortic root size was associated with the shape of the curve adjusting for age, sex and BMIz ( $p=.03$ ), but not ventricular or atrial mass, systolic or diastolic function. **Conclusions:** There was lower proportion of individuals with BPh in this cohort of AA adolescents compared to published studies. Individuals with BPh had healthier beta-cell function indices. No significant relationship of the shape of the OGTT curve was seen with the metrics of heart structure or function at this age. Replication of results in adult cohort(s) is ongoing.

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