



IMAGING AND DIAGNOSTIC TESTING

SEX, OBESITY AND TYPE 2 DIABETES AFFECT THE INTRAMYOCYELLULAR FATE OF GLUCOSE IN HUMANS

ACC Poster Contributions

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Background: We have shown previously that women exhibit a greater increase in myocardial fatty acid utilization and oxidation with the development of obesity and type 2 diabetes (T2DM) compared with men. However, whether sex impacts the intramyocellular metabolism of glucose in these conditions is unknown.

Methods: Three groups - nonobese (N=10; 6 women), obese (N=26; 17 women), and T2DM subjects (N=73; 40 women) underwent positron emission tomography for quantification of myocardial utilization (MGU; nmol/g/min), and intramyocellular metabolism (nmol/g/min) using C11-glucose and well-validated mathematical modeling.

Results: In the men, MGU, glycolysis, glycogen synthesis, and glucose oxidation rates were different among the 3 groups (ANOVAs $P < 0.05$). The significant post-hoc comparisons (Fischer's exact test) between any 2 of the 3 groups are shown by the P values on the Figure, left panel. In the women, there were no differences in MGU, glycolysis, glycogen storage, or glucose oxidation rates among the 3 groups.

Conclusions: The detrimental effect of obesity and T2DM on myocardial glucose metabolism is more pronounced in men compared with women. When taken together with our prior observations, it appears sex impacts the myocardial metabolic response to obesity and T2DM, with fatty acid metabolism being more affected in women and glucose metabolism in men. This sexual dimorphism suggests that sex will impact any therapeutic metabolic manipulation in these patients.

