Abstract: 5879

**Coronary microvascular dysfunction is associated with poor glycemic control in women with diabetes presenting with chest pain and non-obstructive coronary artery disease**

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**Background**

Patients with type 2 diabetes are at an increased risk of cardiovascular events compared to individuals without diabetes. The role glycemic control plays in reducing cardiovascular risk remains uncertain. Coronary microvascular dysfunction (CMD) is more frequent in women compared to men, is prevalent in patients with type 2 diabetes and is linked to adverse cardiovascular events. We compared the association between CMD and glycemic control across sexes in patients with chest pain and non-obstructive coronary artery disease (CAD).

**Methods**

Patients with chest pain who were found to have non-obstructive CAD (stenosis < 40%) at angiography underwent an invasive assessment of endothelial-independent and endothelial–dependent coronary microvascular function. Using a Doppler guidewire, endothelial-independent microvascular function was assessed by measuring the coronary flow velocity in response to intracoronary adenosine and comparing this to baseline to calculate the coronary flow reserve ratio (CFRAdn). A CFRAdn = 2.5 was considered abnormal. Endothelial-dependent microvascular function was assessed by measuring the percent change in coronary blood flow in response to intracoronary infusions of acetylcholine (%?CBF Ach), with a %?CBF Ach = 50% considered abnormal. Patients were classified as having normal versus abnormal CFRAdn and %?CBF Ach. Measurements of HbA1c and fasting serum glucose were obtained at the time of catheterization and compared between groups after stratification by sex.

**Results**

Between 1993 and 2012, 1,469 patients (mean age 50.4 years, 35% male) underwent coronary angiography and invasive testing for CMD, of which 129 (8.8%) had type 2 diabetes. Fifty one (39.5%) had an abnormal %?CBF Ach and 49 (38.0%) had an abnormal CFRAdn. Conventional cardiovascular risk factors did not vary significantly between groups. Females with an abnormal CFRAdn or abnormal %?CBF Ach had a significantly higher HbA1c compared to those with a normal CFRAdn or %?CBF Ach respectively: HbA1c % (standard deviation) 7.4 (2.1) vs. 6.5 (1.1), p=0.035 and 7.3 (1.9) vs. 6.4 (1.2), p=0.022, respectively. Females with an abnormal CFRAdn had significantly higher fasting serum glucose concentrations compared to those with a normal CFRAdn: fasting serum glucose mg/dL (standard deviation) 144.4 (55.6) vs. 121.9 (28.1), p=0.035. These effects were not observed in men. Amongst female diabetics, a higher HbA1c was significantly associated with any CMD after adjusting for covariates: odds ratio (95% confidence interval) 1.69 (1.01 – 2.86) p=0.049; and a fasting serum glucose > 140 mg/dL was significantly associated with an abnormal CFRAdn, 4.28 (1.43 – 12.81).
Conclusion

Poor glycemic control is associated with CMD in females with diabetes who present with chest pain and non-obstructive CAD. These findings highlight the importance of sex-specific risk stratification models and treatment strategies when managing cardiovascular risk in diabetics.