BACKGROUND:

Coronary flow reserve (CFR) provides independent prognostic information in diabetic patients with known or suspected coronary artery disease. However, there have been no substantial data to evaluate CFR in prediabetics. Accordingly, we aimed to evaluate CFR in subjects with prediabetes using second harmonic transthoracic Doppler echocardiography.

METHODS AND RESULTS:

We measured CFR of 65 subjects with prediabetes, 45 patients with overt type 2 diabetes, and 43 sex and age matched normoglycemic healthy subjects with normal glucose tolerance. Ages, gender, existence of hypertension or hypercholesterolemia, smoking status were similar among the groups. CFR was significantly lower in diabetics (2.15±0.39) than in prediabetics (2.39±0.45) and controls (2.75±0.35); in addition, it was significantly lower in prediabetics than controls. Only 2 (5%) of control subjects had abnormal CFR (<2) but 11 (17%) prediabetic subjects and 19 (42%) diabetic patients had abnormal CFR. We found that only age (β=-0.31, P<0.01) and presence of the diabetes (β=-0.57, P<0.01) were significant predictors of lower CFR in a multivariable model that adjusted for other variables. CFR was significantly and inversely correlated with age (r=-0.15, P=0.04), fasting glucose level (r=-0.27, P=0.001), postprandial glucose level (r=0.43, P<0.001), hemoglobin A1C level (r=-0.34, P<0.001), LDL cholesterol level (r=0.22, P=0.009), mitral A velocity (r=-0.27, P=0.001) and Tei index (r=-0.19, P=0.02), whereas mitral E/A ratio, mitral Em (r=0.18, P=0.02), mitral Em/Am ratio (r=0.23, P=0.004) were significantly and positively correlated with CFR.

CONCLUSION:

CFR is impaired in subjects with prediabetics, but this impairment is not as severe as that in diabetics.