COMPARISON OF EXERCISE MYOCARDIAL PERFUSION IMAGING AND EXERCISE ELECTROCARDIOGRAM IN DETECTING ISCHEMIA IN ASYMPTOMATIC PATIENTS WITH TYPE 2 DIABETES MELLITUS: RESULT OF A PROSPECTIVE MULTICENTER STUDY IN DEVELOPING NATIONS

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Background: Testing for myocardial ischemia with electrocardiogram (ECG) or myocardial perfusion imaging (MPI) stress tests in asymptomatic patients with diabetes mellitus (DM) is controversial. The prospective multi-national Ischemia Assessment with Exercise imaging in Asymptomatic Diabetes compared the prevalence of ischemia by exercise MPI to ECG in developing nations.

Methods: The study population was recruited at 12 sites from Asia, Africa and Latin America. DM participants were age- and gender- matched in a 2:1 ratio to non-DM individuals with at least one coronary artery disease risk factor (hypertension, dyslipidemia, active tobacco use or family history of premature atherosclerosis). Each subject underwent a symptom limited exercise test. Rest and exercise ECGs and MPIs were interpreted separately in core labs in a blinded fashion.

Results: During a 4-year recruiting period, 392 DM (60±8 yrs, 73% hypertension, 56% dyslipidemia, 18% tobacco use, and 31% family history) and 205 control participants (57±9 yrs, 68%, 69%, 26%, and 45% respectively) were included in the study. DM participants achieved a lower workload than controls (8.0±3.1 vs. 8.9±2.7 METS, p<0.001). Among participants with diagnostic ECGs a similar proportion of DM and control groups had ischemic ECG changes (15% vs. 12%, p=0.5). A significantly higher proportion of DM group had MPI abnormalities than controls (26% vs. 14%, p<0.001). In participants with ischemia on MPI, only 17% had ischemia by ECG, while in those without ischemia on MPI 10% had evidence of ischemia by ECG. In a multivariable logistic regression model, DM was independently associated with abnormal MPI after controlling for multiple variables, including risk factors and maximum achieved workload (OR 2.1, 95% CI 1.3-3.4, p=0.004). In a separate model that included only DM participants, the duration of DM was independently associated with ischemia on MPI (OR per 10 yrs 1.8, 95%CI 1.2-2.7, p=0.02), while insulin treatment was not.

Conclusions: In this large prospective study, asymptomatic DM participants had (1) more ischemia by MPI than by ECG during exercise and (2) more ischemia by MPI but not by ECG than a control group with other coronary risk factors.