Evaluation of coronary endothelial dysfunction by positron emission tomography: does gender make a difference

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Topic(s):
Positron Emission Tomography (PET)

Citation:
None

Introduction:
Endothelial dysfunction (ED) manifested as abnormality of coronary microvasculature is associated with poor prognosis in patients presenting with chest pain. ED can be noninvasively evaluated by assessment of coronary flow reserve with positron emission tomography (PET). Studies directly comparing ED in men and women are limited. The aim of this study is to compare gender differences in ED as measured by CFR on PET myocardial perfusion imaging.

Methods:
All the consecutive patients referred to PET-MPI between May 2011 and June 2018 were reviewed. Patient without known CAD who had normal perfusion were included in the analysis. Patient with abnormal electrocardiogram, significant transient ischemic dilatation, low left ventricular ejection fraction and high calcium score (>1000 AU) and renal failure were excluded. CFR is calculated as the ratio of stress/rest myocardial blood flow. CFR<2 was considered as abnormal indicating the presence of ED.

Results:
1711 patients were included in the analysis (mean age 60.2 ± 10 year, 68% females). Females were older and had higher BMI and diabetes (DM). Both resting and peak myocardial blood flow (MBF) was higher in females (1.16 vs 1.02 (p<0.0001)) and 3.26 vs 2.9 (p<0.001) respectively. Around 68% of males had abnormal CFR (<2) compared to 63% of females (p=0.05). After adjusting for the confounders, female gender was associated with higher peak MBF (Hazard ratio 0.29, 95% CI 0.19 –0.40, p<0.001) and lower chance of having ED (Hazard ratio -0.15, 95% CI -0.29 - -0.005, p=0.049)

Conclusions:
Endothelial dysfunction as measured noninvasively by CFR on PET is prevalent among both sexes. Higher level of peak MBF in females may call for a different cut-off for abnormal CFR in women. Outcome studies are required to evaluate the clinical utility and prognostic value of such a cut-off.