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DEFINING THE NORMAL LIMITS OF MYOCARDIAL BLOOD FLOW IN PATIENTS EVALUATED FOR CORONARY ARTERY DISEASE BY MEANS OF [150] POSITRON EMISSION TOMOGRAPHY: IMPACT OF GENDER AND RISK PROFILE

ACC Oral Contributions

Ernest N. Morial Convention Center, Room 254

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Background: Quantitative myocardial perfusion imaging (MPI) has gained increasing interest over the last years and is expected to become a routinely used technique in clinical practice. One of the fundamental issues when performing quantitative MPI is to define limits of myocardial blood flow (MBF) in a clinically appropriate population. Furthermore, studies investigating the effect of sex and coronary artery disease (CAD) risk factors on MBF in a clinically appropriate population are scarce. The present study is aimed at defining the lower limit of normal MBF in a patient cohort in whom significant CAD has been excluded.

Methods: A total of 128 patients (mean age 55 ± 10 , 51 men) with a low to intermediate pre-test likelihood for CAD were referred for non-invasive evaluation of CAD on a hybrid PET-computed tomography (CT) scanner. MBF was quantified with [150]H₂O at rest and during adenosine induced hyperaemia. Obstructive CAD was excluded in these patients by means of invasive or CT based coronary angiography or the absence of coronary artery calcium (calcium score = 0).

Results: Global baseline MBF averaged 0.96 ± 0.42 (range 0.48 - 2.91) and 1.15 ± 0.31 (range 0.59 - 2.75) ml/min/g, in men and women, respectively ($p < 0.01$). However, no gender-dependent difference in baseline MBF was seen when corrected for rate-pressure product (1.49 ± 0.79 ; 1.64 ± 0.46 ml/min/g, in men and women, respectively, $p = 0.19$). Global hyperaemic MBF averaged 2.87 ± 0.81 (range 1.52 - 4.95) and 3.90 ± 1.37 (range 1.58 - 8.15) ml/min/g, in men and women, respectively ($p < 0.001$). Multivariate analysis identified gender, age, body mass index (BMI) and hypercholesterolemia to independently negatively impact hyperaemic MBF.

Conclusions: Hyperaemic MBF in patients without apparent CAD shows distinct gender differences. The absolute lower limit of hyperaemic MBF, however, appears to be comparable for men and women. Therefore, using [150]H₂O PET, hyperaemic MBF values below 1.5 ml/min/g, should be considered pathological. Next to gender, age, BMI, and hypercholesterolemia independently impact hyperaemic MBF. Further studies including patients with varying degrees of CAD are warranted to define optimal cut-off values to detect CAD.