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Influence of sex on risk stratification with stress myocardial perfusion Rb-82 positron emission tomography: Results from the PET (Positron Emission Tomography) Prognosis Multicenter Registry.

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Abstract

OBJECTIVES: The aim of the current analysis was to compare sex differences in the prognostic accuracy of stress myocardial perfusion rubidum-82 (Rb-82) positron emission tomography (PET).

BACKGROUND: The diagnostic evaluation of women presenting with suspected cardiac symptoms is challenging with reported reduced accuracy, attenuation artifact, and more recent concerns regarding radiation safety. Stress myocardial perfusion Rb-82 PET is a diagnostic alternative with improved image quality and radiation dosimetry. Currently, the prognostic accuracy of stress Rb-82 PET in women has not been established.

METHODS: A total of 6,037 women and men were enrolled in the PET Prognosis Multicenter Registry. Patients were followed for the occurrence of coronary artery disease (CAD) mortality, with a median follow-up of 2.2 years. Cox proportional hazards modeling was used to estimate CAD mortality. The net re-classification improvement index (NRI) was calculated.

RESULTS: The 5-year CAD mortality was 3.7% for women and 6.0% for men (p < 0.0001). Unadjusted CAD mortality ranged from 0.9% to 12.9% for women (p < 0.0001) and from 1.5% to 17.4% for men (p < 0.0001) for 0% to ≥15% abnormal myocardium at stress. In multivariable models, the percentage of abnormal stress myocardium was independently predictive of CAD mortality in women and men. An interaction term of sex by the percentage of abnormal stress myocardium was nonsignificant (p = 0.39). The categorical NRI when Rb-82 PET data was added to a clinical risk model was 0.12 for women and 0.17 for men. Only 2 cardiac deaths were reported in women <55 years of age; accordingly the percentage of abnormal myocardium at stress was of borderline significance (p = 0.063), but it was highly significant for women ≥55 years of age (p < 0.0001), with an increased NRI of 0.21 (95% confidence interval: 0.09 to 0.34), including 17% of CAD deaths and 3.9% of CAD survivors that were correctly re-classified in this older female subset.

CONCLUSIONS: Stress Rb-82 PET provides significant and clinically meaningful effective risk stratification of women and men, supporting this modality as an alternative to comparative imaging modalities. Rb-82 PET findings were particularly helpful at identifying high-risk, older women.

KEYWORDS: CAD, LVEF, NRI, PET, Rb-82, SPECT, coronary artery disease, left ventricular ejection fraction, net re-classification improvement index, positron emission tomography, prognosis, risk re-classification, rubidum-82, sex, single-photon emission computed tomographic

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