Added prognostic value of myocardial blood flow quantitation in rubidium-82 positron emission tomography imaging

Summary / Zusammenfassung
AIMS: We studied the respective added value of the quantitative myocardial blood flow (MBF) and the myocardial flow reserve (MFR) as assessed with (82)Rb positron emission tomography (PET)/CT in predicting major adverse cardiovascular events (MACEs) in patients with suspected myocardial ischaemia.

METHODS AND RESULTS: Myocardial perfusion images were analysed semi-quantitatively (SDS, summed difference score) and quantitatively (MBF, MFR) in 351 patients. Follow-up was completed in 335 patients and annualized MACE (cardiac death, myocardial infarction, revascularization, or hospitalization for congestive heart failure or de novo stable angina) rates were analysed with the Kaplan-Meier method in 318 patients after excluding 17 patients with early revascularizations (2) (n = 105) than those without [14% (95% CI = 9.1-22%) vs. 4.5% (2.7-7.4%), P < 0.0001]. The lowest MFR tertile group (MFR <1.8) had the highest MACE rate [16% (11-25%) vs. 2.9% (1.2-7.0%) and 4.3% (2.1-9.0%), P < 0.0001]. Similarly, the lowest stress MBF tertile group (MBF <1.8 mL/min/g) had the highest MACE rate [14% (9.2-22%) vs. 7.3% (4.2-13%) and 1.8% (0.6-5.5%), P = 0.0005]. Quantitation with stress MBF or MFR had a significant independent prognostic power in addition to semi-quantitative findings. The largest added value was conferred by combining stress MBF to SDS. This holds true even for patients without ischaemia.

CONCLUSION: Perfusion findings in (82)Rb PET/CT are strong MACE outcome predictors. MBF quantification has an added value allowing further risk stratification in patients with normal and abnormal perfusion images.


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