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SYSTEMIC ARTERY DILATORY CAPACITY AND MYOCARDIAL PERFUSION RESERVE IN NORMALS

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Ultra sound (US) evaluation of systemic artery vasodilatory capacity is widely available and a possible way to detect early signs of CAD. However, little is known about the correlation between vasodilatory capacity of systemic arteries and the myocardial perfusion reserve (MPR). We studied 24 volunteers (25±5 years) with low likelihood of CAD. Using dynamic PET we measured MPR after oral nitroglycerin (NTG, 400 µg) and after dipyridamole (0.56 mg/kg/min). Data were compared with US data of brachial artery vasodilatory capacity expressed as increase in cross sectional diameter after NTG 400 µg.

Conclusion: Peripheral dilatory capacity does not correlate well with neither the dipyridamole induced hyperemia (r=0.01, p=NS) nor with the myocardial perfusion response after NTG (r=0.01, p=NS). The lack of correlation between the two techniques indicate different mechanisms controlling these factors.

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DOES RADIOFREQUENCY CATHETER ABLATION (RFCA) INDUCE A DETERIORATION IN SYMPATHETIC INNervation?


RFCA is effective treatment for reentrant tachycardias because it destroys malignant accessory pathways. An eventual parallel destruction of sympathetic nerves may, however, create new functional areas of impaired sympathetic innervation. To clarify this relationship, we examined 6 patients before and 2 weeks after RFCA. We measured MPR and sympathetic innervation by C-11-hydroxyephedrine (HED) - PET and N-13-ammonia -PET. The studies were performed before and 2 weeks after RFCA. In addition to visual analysis, HED retention was quantified in the myocardial quadrant distal to the location of intervention (DI); these results were compared with values in remote areas (RA). Before RFCA, myocardial perfusion showed homogeneous distribution in 5 of 6 patients. One patient demonstrated a perfusion defect in the posterior wall. HED retention matched perfusion distribution in all patients. After RFCA there was no significant change observed either in ammoni or in HED distribution. Quantitative HED retention data from 5 patients showed no significant change before vs. after RFCA either in DI or in RA (8.0 ± 3.0% vs. 9.5 ± 3.7% and 8.2 ± 2.7% vs. and 9.8 ± 3.0%, respectively). Thus, HED-PET does not demonstrate any abnormalities of tracer uptake in sympathetic nerve terminals indicating integrity of autonomic innervation following regional ablation therapy.

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MYOCARDIAL BLOOD FLOW REGULATION IN INFARCTED PATIENTS WITH STRESS-INDUCED NORMALIZATION OF NEGATIVE T WAVES

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The correlation of stress-induced normalization of negative T waves (NTW) with regional myocardial blood flow (MBF) regulation and tissue viability remains still debated. To clarify its meaning, 14 patients with previous myocardial infarction (13 Q waves) and negative T waves on baseline ECG and 10 normal subjects were studied by means of positron emission tomography and N-13 ammonia, at rest and after dipyridamole infusion. Scintigraphic segments with baseline echocardiographic dysfunction were identified as the correspondent infarcted regions of NTW (G1, n=4) or persistent negative T waves (G2, n=10) observed during dipyridamole ECG test. Resting MBF was similar in G1 and G2 (.33±.18 vs .38±.27 mL/min/g, respectively, P=NS) and significantly lower than in normals (1.07±.28 mL/min/g, P<.01). Following dipyridamole, MBF was significantly higher in G1 than in G2 (1.03±.69 vs .73±.48 mL/min/g, respectively, P<.01) and markedly lower than in normals (4.07±.03 mL/min/g, P<.01). Thus, in infarcted dysfunctional stress-induced NTW demonstrates better MBF availability than persistent negative T waves despite similar values of resting perfusion, suggesting a better preserved coronary microcirculatory function.

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THE RATE-PRESSURE-PRODUCT AS A DETERMINANT OF MYOCARDIAL BLOOD FLOW DURING DIPYRIDAMOLE STRESS IN HEALTHY, YOUNG VOLUNTEERS

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Several studies in elderly patients have shown a significant correlation of the rate-pressure-product (RPP) to myocardial blood flow (MBF) at rest as well during cold pressor stress. However in this population, no such relation has been shown during dipyridamole. We studied 23 young, healthy, male volunteers (age 29±4 years), all non-smoking, non-hypertensive, with normal levels of blood glucose and cholesterol, in whom cardiac disease was excluded by history and exercise ECG, with positron emission tomography (PET) and 13N-Ammonia at baseline, during a Cold Presser Test (CPT) and after coronary vasodilation with dipyridamole (DIPY). All results are expressed as mean ± SD.

The correlation between RPP and MBF during dipyridamole in young, healthy volunteers, which contradicts the assumption, that hyperemic MBF is independent of myocardial oxygen consumption during dipyridamole. This is possibly due to an age-dependent difference in the effect of dipyridamole.