

Comparison of myocardial blood flow induced by adenosine triphosphate and dipyridamole in patients with coronary artery disease

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Myocardial perfusion imaging with adenosine triphosphate (ATP) has been used increasingly to diagnose coronary artery disease (CAD) and assess risk for this disease. This study compared absolute myocardial blood flow (MBF) and myocardial flow reserve index (MFR) with ATP and dipyridamole (DIP) in patients with CAD. MBF was quantified by ^{15}O -H₂O PET in 21 patients with CAD (17 male, 4 female), aged 55 to 81 years. MBF was measured at rest, during intravenous injection of ATP (0.16 mg/kg/min), and again after DIP infusion (0.56 mg/kg). Regions of interest were drawn in nonischemic and ischemic segments based on findings from thallium-201 (^{201}Tl) scintigraphy and coronary angiography (CAG). Absolute MBF values and indexes of MFR were calculated in nonischemic and ischemic segments. Intravenous injection of ATP and DIP significantly increased MBF in nonischemic (2.4 ± 0.9 and 2.1 ± 0.8 ml/g/min, respectively; $p < 0.01$, for both) and in ischemic segments (1.3 ± 0.4 and 1.5 ± 0.4 ml/g/min, respectively; $p < 0.01$, for both). There was a significant difference in MBF values between ATP and DIP in nonischemic segments ($p < 0.05$), which was not observed in ischemic segments. In nonischemic segments, ATP produced higher MFR than DIP (2.1 ± 0.8 and 1.8 ± 0.7 , respectively; $p < 0.05$), while no significant difference was observed in ischemic segments (1.5 ± 0.6 and 1.7 ± 0.3 , respectively). ATP produced a greater hyperemia than DIP between the ischemic and nonischemic myocardium in patients with CAD. ATP is as effective as DIP for the diagnosis of CAD.

Key words: ATP, DIP, myocardial blood flow, ^{15}O -H₂O PET, coronary artery disease