Summary

The Studies of Hemodynamic Changes and Liver Uptake in a Combination of ATP Stress Test and Low Workload Exercise Test on Myocardial Scintigraphy

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A pharmacological adenosine-tri-phosphoric acid (ATP) stress test has been used in patients who can not perform an enough exercise stress test. However, falling blood pressure during the stress test and increased liver uptake of the tracer are often found in patients undergoing the ATP test. To prevent these phenomena, a combination of ATP stress test and low workload exercise test (ATP & EX) is proposed. The usefulness of this newly developed stress test was elucidated from two viewpoints. Firstly, the changes of hemodynamic parameters were measured in 34 patients: 17 undergoing ATP alone and 17 undergoing ATP & EX. Systolic blood pressure fell from 150±20 mmHg to 126±16 mmHg ($p<0.05$) for ATP alone. However, it changed from 141±19 mmHg to 149±31 mmHg (ns) for ATP & EX. There was a significant fall in systolic blood pressure (>30 mmHg) in 58.8% for ATP alone and 5.9% for ATP & EX ($p<0.01$). Secondly, the ROI count in the liver and heart on an anterior projection image were measured in 38 patients: 11 undergoing ATP alone, 13 undergoing ATP & EX, and 14 undergoing an ergometer exercise test (EX). The ROI count in the liver at 60 minutes after tracer injection were 29.0±10.7 count/pixel, 21.4±5.2 count/pixel, 18.3±4.5 count/pixel for ATP alone, ATP & EX and EX, respectively. The activities for ATP & EX and EX were lower than that for ATP alone ($p<0.05$ and $p<0.01$). Thus, ATP & EX decreased the rates of the fall of systolic blood pressure and decreased liver uptake of the tracer compared with ATP alone. In conclusion, ATP & EX is a useful stress method for myocardial perfusion scintigraphy in patients who can not perform the enough exercise stress test.

Key words: ATP, Low workload exercise, ^{99m}Tc-tetrofosmin, Myocardial scintigraphy, Blood pressure.