

## Limitation of infarct size with preconditioning and calcium antagonist (Diltiazem): Difference in $^{99m}\text{Tc}$ -PYP uptake in the myocardium

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Ischemic cell injury and the uptake mechanism of  $^{99m}\text{Tc}$ -PYP (Pyrophosphate) were studied with preconditioning and calcium antagonist. Method: The coronary artery of an adult mongrel dog was clamped for 1 hour, followed by reperfusion and  $^{99m}\text{Tc}$ -PYP injection. A control group (group C, n = 8), a group in which continuous drip infusion of diltiazem (10 mg/kg) (group D, n = 7), and a group preconditioned by six 5-minute clampings and perfusions before occlusion (group P, n = 6) were compared. Results: Wall motion was fully recovered in group D but not in group P after 2 hours of reperfusion. The  $^{99m}\text{Tc}$ -PYP uptake ratio showed a significant ( $p < 0.05$ ) reduction in group D (11.5 : 3.6 compared with group C), but not in group P (11.5 : 9.1,  $p = 0.25$ ). The infarct area was  $1.2 \pm 0.6\%$  of the left ventricle in group D,  $1.3 \pm 0.4$  in group P, and  $6.4 \pm 1.0$  in group C ( $p < 0.01$  in groups D and P vs. group C). Conclusions: These findings suggest that preconditioning does not alleviate stunning, but it improves cell injury in spite of high uptake of  $^{99m}\text{Tc}$ -PYP. Diltiazem protects from both stunning and cell injury, suggesting a different mechanism of myocardial protection from that of preconditioning.

**Key words:** stunning, calcium-antagonist,  $^{99m}\text{Tc}$ -pyrophosphate, preconditioning, myocardial protection