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COMPARISON OF CARDIOPROTECTIVE EFFICACY RESULTING FROM A COMBINATION OF ATORVASTATIN AND ISCHAEMIC POSTCONDITIONING IN DIABETIC AND NON-DIABETIC RAT MODELS

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Objectives This study aimed to investigate whether the combination of acute or chronic atorvastatin treatment with ischaemic postconditioning (Ipost) exerts differential effects within the hearts of diabetic and non-diabetic rats.

Methods Diabetic and non-diabetic rats were randomly assigned to six groups: (1) nonconditioning; (2) Ipost; (3) acute statin (50 $\mu\text{mol/l}$ atorvastatin during reperfusion) without Ipost; (4) acute statin with Ipost; (5) chronic statin (10 mg/kg atorvastatin per day for 2 weeks) without Ipost; (6) chronic statin with Ipost. Hearts from these rats were subjected to 30 min of global ischaemia, followed by 120 min of reperfusion. Infarct size, hemodynamics and the expression levels of Akt and endothelial nitric-oxide synthase (eNOS) were examined.

Results Ipost did not limit infarct size and recover contractile dysfunction in the hearts of diabetic rats ($p>0.05$). Acute atorvastatin with Ipost resulted in infarct size-limiting and contractile dysfunction-recovering effect in both diabetic and non-diabetic hearts (infarct size 37.4% vs 58.5% and 23.6% vs 44.4%, $p<0.05$), and produced a further activation of Akt and eNOS signalling pathways to enhance these protective effects in the hearts of diabetic rats. Chronic statin treatment with Ipost neither reduced infarct size nor increased myocardial dysfunction recovery in both diabetic and non-diabetic rats (infarct size 59.2% vs 58.5% and 46.7% vs 44.4%, $p>0.05$), and this might be associated with an inhibition of Akt and eNOS phosphorylation.

Conclusions The combination of acute atorvastatin treatment with Ipost shows a stronger protective effect within the hearts of diabetic rats, but chronic statin with Ipost fails to protect hearts against reperfusion injury in either diabetic or non-diabetic rats. These findings will be important for the design of future clinical investigations.