

Preconditioning tachycardia decreases the activity of the mitochondrial permeability transition pore in the dog heart

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Cardioprotection by preconditioning is a central issue of current research on heart function. Several reports indicate that preventing the assembly and opening of the mitochondrial permeability transition pore (mPTP) protects the heart against ischemia-reperfusion injury. We have previously reported that brief episodes of tachycardia decrease the infarct size produced by subsequent prolonged occlusion of a coronary artery, indicating that controlled tachycardia is an effective preconditioning manoeuvre. The effects of preconditioning tachycardia on mPTP activity have not been reported. Therefore, in this work we investigated if preconditioning tachycardia protects against calcium-induced mitochondrial swelling, a measure of mPTP activity. We found that tachycardia decreased by 2.5-fold the rate of mitochondrial calcium-induced swelling, a factor that presumably contributes to the cardioprotective effects of tachycardia. The oxidative status of the cell increased after tachycardia, as e