Abstract:

AIMS: To evaluate effects of beta-adrenergic receptor blockade on allograft performance, and to correlate these effects with sympathetic reinnervation. METHODS AND RESULTS: Myocardial catecholamine storage capacity was determined in 12 non-rejecting transplant recipients using PET and C-11 adrenaline (epinephrine). Haemodynamics and left ventricular function were measured using radionuclide angiography at rest and during symptom-limited exercise before and after non-selective beta-blockade (propranolol iv). Exercise time and stress-induced increases of heart rate and LVEF before beta-blockade were significantly higher in reinnervated compared to denervated recipients. While resting LVEF remained unchanged, heart rate and blood pressure were generally reduced by beta-blockade, which was well tolerated by all patients. Exercise time and increases of heart rate and LVEF were more attenuated in reinnervated recipients. Differences of chronotropic and inotropic response to exercise between groups were no longer present following beta-blockade. Correlations between myocardial adrenaline retention, peak heart rate and increase of global, as well as regional ejection fraction during exercise were observed before, but not during beta-blockade. CONCLUSION: Acute, non-selective beta-blockade is well tolerated by
transplant recipients, but significantly attenuates beneficial functional effects of sympathetic reinnervation on exercise performance. The data suggest that reappearance of sympathetic nerve terminals is associated with reestablishment of intact pre-/postsynaptic interaction.