

Lortet S, HG Zimmer. Functional and metabolic effects of ribose in combination with prazosin, verapamil and metoprolol in rats in vivo. *Cardiovasc Res* 1989;23:702-708.

Ribose improves the function of the rat heart in various pathological conditions through its effects on cardiac energy metabolism, while having no direct haemodynamic actions. We therefore studied its functional and metabolic effects in closed chest rats when given in combination with prazosin, verapamil or metoprolol, all of which have direct effects on the circulation. Ribose administration for 24 h at 200 mg.kg⁻¹.h⁻¹ did not affect heart function but increased the available pool of 5-phosphoribosyl-1-pyrophosphate in heart (four fold) and skeletal muscle (1.7-fold), as assessed by the incorporation of ¹⁴C-adenine into the adenine nucleotides. The utilisation of adenine for adenine nucleotide synthesis, expressed as the ratio of adenine nucleotide radioactivity to tissue extract radioactivity, was 70% in heart and 20% in skeletal muscle under control conditions, and 97% and 88% after 24 h of ribose administration. Ribose decreased the ¹⁴C-adenine incorporation into the adenine nucleotides in kidney, lungs and liver. After 24 h infusion of prazosin (100 micrograms.kg⁻¹.h⁻¹), heart rate and LVdP/dtmax were not changed, but LVSP (-20%), mean aortic pressure (-16%) and peripheral resistance (-40%) were decreased. Cardiac output was enhanced (+40%). Verapamil (2mg.kg⁻¹.h⁻¹) and metoprolol (2mg.kg⁻¹.h⁻¹) infused for 24 h decreased the pressure-rate and pressure-volume product of the left ventricle to the same extent (-40%). Verapamil had no influence on cardiac output, while metoprolol depressed it (-30%). Simultaneous administration of prazosin, verapamil or metoprolol with ribose did not affect the ribose induced increase in the myocardial 5-phosphoribosyl-1-pyrophosphate pool.