

THE EFFECT OF NITROGLYCERIN ON THE MICROCIRCULATION OF THE BEATING CAT AND RAT VENTRICULAR MYOCARDIUM. H.Tillmanns, H.Leinberger, M.Steinhausen and H.Thederan. Med. Clinic III and I.Department of Physiology, Heidelberg, West Germany.

The effect of peripherally administered nitroglycerin (TNG) on the terminal vascular bed of the ventricular myocardium was investigated in 8 cats and 12 rats, using in vivo microscopic techniques. Following thoracotomy, phasic capillary red cell velocities and the number of perfused capillaries were determined by means of epiillumination and transillumination of superficial layers of the cat and rat ventricular myocardium, under control condition and following i.v. administration of TNG (30  $\mu$ g/kg). Phasic microvascular flow velocities were measured by high speed cinematography and following i.v. injection of fluorescent dextrans or thymus cells, using a video tape system. Hydrostatic pressures in arterioles and venules were determined by applying micropuncture and a micropipet servo system. In some experiments, the fall in arterial blood pressure induced by TNG exceeded the decline in arteriolar and venular pressures; however, this difference was not significant. In the cat and rat ventricular myocardium, the application of TNG resulted in a marked decrease in mean capillary flow velocities (from 1230 to 980  $\mu$ m/sec, cat ventricle) and in a slight increase in the number of perfused capillaries.

CHANGES IN ENERGY TRANSDUCTION EFFICIENCY IN MITOCHONDRIA FROM ISCHEMIC MYOCARDIUM. A.Toleikis, P.Dzeja, A.Prashkevichius. Laboratory of Biochemistry, Institute for Cardiovascular Research, Kaunas, Lithuanian SSR, USSR.

The present work was designed as an attempt to elucidate the factors which influence the energy transduction efficiency in mitochondria from ischemic myocardium. Temporary (60 min.) coronary artery occlusion (TCAO) and autolysis were used as the models of ischemia in this work. It was found that one day after TCAO the permeability of the inner membrane (IM) to  $H^+$  was increased by 64% and the maximal activity of the glutamate + malate oxidase system was reduced by 35% with respect to control. The proton -electrochemical gradient and the rate of oxidative phosphorylation were decreased by 35 and 55% respectively. The maximal activity of the glutamate + malate oxidase system was decreased by 20, 37, 52, 52% and the IM permeability to  $H^+$  was increased by 104, 68, 253 and 378% after 0.5, 1, 2 and 4 hours of autolysis respectively. The addition of albumin to the incubation medium reduced the increased  $H^+$  permeability of IM. The data obtained suggest that the alterations in energy transduction efficiency of mitochondria from ischemic myocardium largely depend on the increase of IM permeability to  $H^+$ .