

**α -遮断薬, フェントラミンおよびブナゾシンの
低酸素負荷および再酸素化心筋に及ぼす
心筋保護効果**

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**Cardioprotective Action of Alpha-Blocking Agents, Phentolamine
and Bunazosin, on Hypoxic and Reoxygenated Myocardium**

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ABSTRACT The present study was undertaken to determine whether alpha-blocking agents, phentolamine and bunazosin, may exert a cardioprotective effect on hypoxic and subsequently reoxygenated hearts. For this purpose, rabbit hearts were perfused for 20 min under hypoxic conditions, followed by a 45 min-reoxygenation. Agents were administered between the 8th and 20th min of hypoxic perfusion. Hypoxic perfusion for 8 min resulted in a decline of cardiac contractile force and myocardial high-energy phosphates and a loss of adenine nucleotide metabolites from the heart, whereas a rise in resting tension was not observed. Neither increase in perfusion pressure, release of creatine kinase from hearts nor increase in tissue calcium was observed. At 20 min-hypoxia, significant changes in resting tension and perfusion pressure of the heart and release of creatine kinase from the heart were observed. Cardiac contractile force after 45 min of reoxygenation was less than 10% of the initial value. Treatment with 83 μ M phentolamine or 46 μ M of bunazosin resulted in a significant suppression of hypoxia-induced increase in tissue calcium, release of creatine kinase and adenine nucleotide metabolites and rise in perfusion pressure and resting tension. Treatment with either phentolamine or bunazosin resulted in appreciable recovery of cardiac contractile force. Reoxygenation-induced release of creatine kinase was also suppressed significantly. Two possible mechanisms for the protective effect of this treatment are considered; 1) preservation of ATP

metabolites which may be utilized as substrates for a salvage synthesis of ATP during reoxygenation and 2) prevention of a nonselective transmembrane flux of cellular constituents due to changes in cell membrane permeability.

抄録 アドレナリン α -遮断薬, フェントラミンおよびブナゾシンが低酸素負荷とその後の再酸素化された心臓に心筋保護作用を有すか否かを検討しました。低酸素負荷開始後8分目から20分目まで薬物を投与すると, 再酸素化後の心収縮力回復の増強, 静止張力上昇の抑制, 高エネルギーリン酸化合物回復の促進, ATP代謝物やクレアチンキナーゼの心臓からの遊離の抑制等の改善効果が観察された。この結果は α -遮断薬の一部のものに虚血心筋保護作用があることを示唆した。