Phentolamineの虚血心筋保護効果

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心筋の構造と代謝　10，183-190 (1988)

Protective Effect of Phentolamine on Hypoxic Heart

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ABSTRACT The prsent study was designed to determine whether or not phentolamine, a representative alpha-adrenceptor blocking agent, is capable of protecting the myocardium from hypoxia-induced impairments in caediac function and metabolism. For this purpose, isolated rabbit hearts were perfused for 25 min under hypoxic conditions in the presence and absence of 82.7 μM phentolamine, followed by 45 min-reoxygenation. Hypoxia and subsequent reoxygenation resulted in a contractile failure and a rise in resting tension (more than 5 fold increase). Hypoxia and subsequent reoxygenation also induced a marked decline in ATP and CP (70% decrease) and an accumulation of tissue calcium (70% increase). Furthermore, the hearts markedly released creatine kinase and ATP metabolites such as adenosine, inosine and hypoxathine during hypoxia and subsequent reoxygenation. The treatment with phentolamine during hypoxic perfusion significantly recovered cardiac contractile force and restored myocardial ATP content upon reoxygenation. The treatment with the agent suppressed postypoxia/reoxygenation-induced rise in resting tension, accumulation of tissue calcium, and release of creatine kinase and ATP metabolites from the heart. The results suggest that phentolamine is capable of protecting myocardium from hypoxia-induced derangements in cardiac function and metabolism.

抄録　本研究は，代表的なアドレナリン性α－遮断薬のPhentolamine (PHE) が，低酸素負荷により引き起こされる障害から心筋組織を保護するか否かを検討するため企画された。家兎摘出心臓に低酸素負荷をかけ，その後再酸素化を行なうと，様々な機能的，代謝物障害が観察された。低酸素負荷期間中，PHEを作用させると，再酸素化時に心機能は顕著に回

復し，代謝的障害の発生も抑制された。以上の結果より，PHE には低酸素負荷により引き起こされる障害から心筋組織を保護する能力のあることが示唆された。