ischaemia-induced release of lactate dehydrogenase from 18.8 ± 2.5 (s.e. mean) to 5.0 ± 0.9 u/gm wet weight ($P < 0.01$). In addition, the recovery of mechanical performance following restoration of coronary perfusion was substantially improved in the presence of LHPG.

The degree of myocardial ischaemic injury following coronary artery occlusion in pentobarbitone-anaesthetised dogs during infusions of isoprenaline, as assessed by epicardial ST-mapping (Maroko *et al.*, 1972) was reduced by approximately 40% after LHPG (2×10^{-5} mol/kg i.v.); the effect persisted for at least 2 h.

Preliminary studies in healthy volunteers (L. Carlson, personal communication) and in patients with coronary artery disease (D. Jewitt, personal communication) have demonstrated myocardial metabolic effects similar to those described above. This profile of activity suggests that LHPG may be useful in the treatment of angina, in limiting infarct size or in reducing the incidence of dysrhythmias following acute myocardial infarction.

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References

AUKLAND, K., BOWER, B.F. & BERLINER, R.W. (1964). Measurement of local blood flow with hydrogen gas. *Circulation*, **14**, 164–187.

HIGGINS, A.J., MORVILLE, M. & BURGES, R.A. (1978). Comparison of the actions of dichloroacetate and 2-bromopalmitate in palmitate-perfused rat hearts: effects on carbohydrate metabolism, contractility and oxygen consumption. *Biochem. Soc. Trans.*, **6**, 152–154.

KJEKSHUS, J.K. & MJØS, O.D. (1973). Effect of inhibition of lipolysis on infarct size after experimental coronary artery occlusion. *J. Clin. Invest.*, **52**, 1770–1778.

MAROKO, P.R., LIBBY, P., SOBEL, B.E., BLOOR, C.M., SYBERS, H.D., SHELL, W.E., COVELL, J.W. & BRAUNWALD, E. (1972). Effect of glucose-insulin-potassium infusion on myocardial infarction following experimental coronary artery occlusion. *Circulation*, **45**, 1160–1175.

MJØS, O.D. (1971). Effect of inhibition of lipolysis on myocardial oxygen consumption in the presence of isoproterenol. *J. Clin. Invest.*, **50**, 1869–1873.

SIMONSEN, S. & KJEKSHUS, J.K. (1978). The effect of free fatty acids on myocardial oxygen consumption during atrial pacing and catecholamine infusion in man. *Circulation*, **58**, 484–491.

WALDENSTRÖM, A.P., HJALMARSON, A.C., JODAL, M. & WALDENSTRÖM, J. (1977). Significance of enzyme release from ischaemic isolated rat heart. *Acta Med. Scand.*, **201**, 525–532.

Potential protective value of enhanced myocardial carbohydrate utilisation with reduced free fatty acid uptake after UK 25842 in patients with coronary artery disease

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The influence of UK 25842 (L-4-hydroxyphenylglycine) in a dose of 4–12 mg/kg body weight, given by intravenous infusion over 5 min, on haemodynamics and myocardial metabolism was investigated in 20 patients with obstructive coronary artery disease before and during angina pectoris induced by atrial pacing. Heart rate, intra-cardiac pressures, cardiac output and coronary venous blood flow were measured. Myocardial uptake and extraction ratios (E.R.) of lactate, pyruvate, free fatty acids (F.F.A.), acetoacetate, glycerol and triglycerides were determined from systemic arterial and coronary sinus blood samples.

No major haemodynamic changes or any side effects occurred after UK 25842. Atrial pacing time to the onset of angina increased from 289 ± 33 to 360 ± 35 s UK 25842 (12 mg/kg). Both myocardial F.F.A. uptake and extraction ratios fell. During angina, myocardial F.F.A. E.R. was reduced from 20.2 ± 4.0 to 9.4 ± 2.3% ($P < 0.05$). There was a corresponding increase in myocardial E.R. of lactate (−14.4 ± 11.6 to 11.1 ± 4.2%) and pyruvate (9.3 ± 6.9 to 29.2 ± 5.1%), ($P < 0.01$), with reversal of lactate production in 60% of patients. Myocardial glucose uptake was also increased. This change from F.F.A. to carbohydrate utilisation by the myocardium was confirmed by an increase in the myocardial R.Q. from 0.7 to 0.81 ($P < 0.05$). These changes were associated with a reduction in myocardial oxygen consumption (MVO_2) from 27.4 ± 2.7 to 24.8 ± 2.8 ml/min ($P < 0.05$).

This reduction in MVO_2 associated with enhanced myocardial carbohydrate utilisation, produced by UK 25842, has great potential value not only in patients with angina but also in those with myocardial infarction, when jeopardised areas of the myocardium may be salvaged.