

# 静的膝伸展運動時における血管収縮作用に及ぼす局所冷却の影響

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## Abstract

To test whether there are regional differences in the exercise pressor reflex within an exercising muscle, we evaluated the effect of regional cooling, which delays activation of the muscle metaboreflex, using vascular resistance as an index of sympathetic nerve activity in the non-exercised limb during exercise. Nine subjects performed 2 min of ischaemic isometric knee extension at 30% of maximal torque in three trials: without cooling (C-trial), with cooling of the proximal thigh portion (P-trial), and with cooling of the distal portion (D-trial). Heart rate, mean arterial pressure, calf blood flow in the non-exercised leg, and calf vascular resistance in the non-exercised leg were measured. In both cooling trials, regional cooling significantly decreased the skin temperature of the exposed portion, but had no effect on the opposite portion of the thigh. During exercise, heart rate and mean arterial pressure increased significantly, but were not affected by regional thigh cooling. In contrast, at 60 s of exercise, calf blood flow was significantly higher in the D-trial than in the C-trial ( $2.94 \pm 0.23$  vs.  $1.97 \pm 0.22$  ml·100g<sup>-1</sup>·min<sup>-1</sup>,  $P < 0.05$ ). Consequently, calf vascular resistance was significantly lower in the D-trial than in both the C- and P-trials at 60 and 90 s of exercise. These findings suggest that stimulating different regions within a given muscle causes a different magnitude of increase in calf vascular resistance evoked by the exercise pressor reflex during exercise.

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