

# **Endocrine and hyperemic responses to low-intensity aerobic exercise with vascular occlusion**

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## **Abstract**

Low-intensity resistance exercise for muscular hypertrophy, combined with vascular occlusion, has previously been shown to promote secretion of plasma growth hormone (GH) because of acute hypoxia in the working muscles. Similarly, a moderate-intensity aerobic exercise (without occlusion) for improvement in endothelial function has been shown to increase blood flow through vessel lumina. Therefore, we investigated whether an enhanced endocrine response and increased blood flow can be achieved simultaneously by combining low-intensity aerobic exercise with occlusion.

To investigate this hypothesis, we examined endocrine and post-exercise hyperemic responses to leg cycle exercise in seven healthy subjects. Exercise was performed at an intensity of about 45% of the maximum heart rate for 20 min, either with or without vascular occlusion applied at the proximal end of both thighs.

Plasma concentrations of GH, noradrenalin, lactate, and nitrite/nitrate, but not insulin-like growth factor 1, increased more after the exercise with occlusion than without occlusion. Maximal blood flow and diameter change in the superficial femoral artery were greater after the exercise with occlusion than that without occlusion.

These results suggest that a low-intensity cycle exercise with vascular occlusion can promote GH secretion through acute hypoxia and accumulation of metabolites, and NO production through enhanced post-exercise hyperemia.

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