



Figure 3 Relations between leg muscle mass changes and basal femoral blood flow changes in the two trained groups ($n = 24$). Left leg LSTM (lean soft tissue mass) is defined as left leg muscle mass. Change in leg muscle mass was not related to that in femoral leg blood flow ($r = -0.05$).

pressure (Tanimoto & Ishii, 2006), and so it would be a safe and useful method of exercise for increasing peripheral blood flow. The reduction in leg blood flow may limit peripheral glucose uptake and contribute to glucose intolerance and hyperinsulinemia (Lind & Lithell, 1993). In addition, it may also impair the clearance of atherogenic lipids and contribute to chronic dyslipidaemia (Baron et al., 1990). Regular resistance training in the LST group may contribute to a lower incidence of cardiovascular disease through its influence on basal femoral blood flow.

Figure 2 Femoral and carotid vascular resistance and conductance before and after the intervention period. Means \pm SE ($n = 12$ for each group) in femoral and carotid vascular conductance (upper), femoral and carotid vascular resistance (lower) in the three experimental groups. *Significant difference ($P < 0.05$) between pretraining and post-training values. †Significant differences ($P < 0.05$) between groups. Femoral carotid resistance in both training groups (LST and HN) decreased, and femoral carotid conductance in both training groups (LST and HN) increased significantly after experimental period.

Figure 4 Relations between cardiac output changes and basal femoral blood flow changes in trained group subjects ($n = 24$). Change in cardiac output was not related to that in basal femoral blood flow ($r = 0.19$).

Conclusion

The results of the present study indicated that resistance training, even in LST, increased basal femoral blood flow and vascular conductance as in HN, and that regular resistance training from a young age may contribute to preservation of basal limb blood flow. LST promotes muscular hypertrophy and strength gain comparable to those in HN without high mechanical load. LST is proposed as a safe and useful exercise method not only for muscular hypertrophy and strength gain, but also for increasing peripheral blood flow and vascular conductance as an additional

effect. This study investigated preventive effects for healthy people, not curative effects for patients with metabolic syndrome or other diseases. Expanding this study to cover investigation in patient groups is an issue for future consideration.

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