CAROTID ARTERY VASOREACTIVITY TO COLD PRESSOR TEST IN RESISTANCE-TRAINED MEN
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BACKGROUND and PURPOSE: The direction and magnitude of change in the carotid artery diameter during and after the sympathetic stress induced by foot submersion in ice slush (cold pressor test: CPT) is an evaluation index of endothelial function, which is altered based upon the presence of risk factors and coronary diseases. The carotid artery reactivity to CPT may have a valuable role in coronary risk assessment and response to therapy. Resistance training has become a popular mode of exercise, but intense weight training is shown to stiffen central arteries. The purpose of the present study was to clarify relationships among regular resistance-training, carotid arterial compliance, and vasoreactivity to CPT.

METHODS: Twelve resistance-trained middle-aged men (age, 38.7 ± 1.7 yrs; height, 171.0 ± 1.8 cm; body weight, 74.9 ± 2.1 kg) and thirteen age-matched controls (age, 36.8 ± 1.4 yrs; height, 171.4 ± 1.5 cm; body weight, 73.6 ± 1.8 kg) were studied. Resistance-trained men had been performing resistance training for over 10 years. A combination of ultrasound imaging of the pulsatile common carotid artery with simultaneous applanation of tonometrically-obtained arterial pressure from the contralateral carotid artery permits noninvasive determination of arterial compliance. The direction and magnitude of change in the carotid artery diameter during and after the sympathetic stress induced by foot submersion in ice slush for 90 seconds was measurement of B-mode ultrasound.

RESULTS and DISCUSSION: The leg press power and the handgrip strength in resistance-trained men were significantly higher than those in control men (2293 ± 155 vs 1693 ± 99 watts, 51.0 ± 2.0 vs 44.9 ± 1.8 watts/kg, respectively; both p<0.05). The carotid arterial compliance was significantly lower in resistance-trained men compared with control peers (0.09 ± 0.01 vs 0.13 ± 0.01 mm²/mmHg, p<0.05). However, there was no significant difference in the amount and the percentage of change in carotid artery diameter to CPT between resistance-trained (0.41 ± 0.08 mm and 6.6 ± 1.2 %) and control men (0.36 ± 0.07 mm and 5.5 ± 1.0 %). These findings suggest that even regular resistance training with reducing the carotid arterial compliance could not affect the carotid endothelial function. In all population, there were no significant correlation between the carotid arterial compliance and the carotid artery response to CPT. The carotid arterial stiffening induced by resistance training may not be associated with the carotid artery endothelial dysfunction.

CONCLUSIONS: We concluded that even habitual resistance training with reducing carotid arterial compliance is not associated with the carotid artery endothelial function evaluated by vasoractivity to cold pressor test.

Keywords: Cardiovascular, Strength Training, Adaptation