Effects of Leg Blood Flow Restriction during Low Intensity Aerobic Exercise on Cardiovascular Function

Jun Sugawara

1National Institute of Advanced Industrial Science and Technology

**Background:** "Kaatsu" (i.e., blood flow restricted exercise) is a very popular exercise modality in Japan and is spreading widely to the rest of the world. The underlying principle of this training is that under the conditions of restricted muscle blood flow, even low-intensity exercise can induce muscle strength and hypertrophy. One concern, however, is that blood flow restriction (BFR) may be harmful for those with compromised cardiac function.

**Methods:** To determine the impact of leg BFR during walking on cardiovascular function, 17 young (26±1 years) healthy volunteers underwent five bouts of 2-minute treadmill walking at 2 mile/hour with 1-min interval either with or without tourniquet cuffs inflated on both thighs.

**Results:** Heart rate increased more during the BFR session, whereas stroke volume decreased greater during the BFR session. Blood pressure increased significantly and substantially during the BFR session (4-fold). Consequently, Increases in double product, an index of myocardial oxygen demand, was more than 3-fold higher in the BFR condition. Systemic arterial compliance evaluated by stroke volume/pulse pressure ratio significantly increased during the control session by 14% but reduced during the BFR condition by 19%.

**Conclusion:** Even at low intensity, the aerobic exercise with BFR requires a greater cardiac work and decreases endothelial function. Limb BFR during exercise may need to be more cautiously prescribed to those with compromised cardiac conditions.

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