

A RANDOMIZED CONTROLLED TRIAL COMPARING THE EFFECT OF CONVENTIONAL AND MODIFIED HANDGRIP EXERCISE TOWARDS THE VEIN SIZE AND BLOOD FLOW OF UPPER LIMBS IN HEALTHY SUBJECTS

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Abstract

Introduction

Creating a durable vascular access for hemodialysis is a challenge especially in the unfavorable vein size. Post-operative handgrip exercise improves AVF maturation. This study was undertaken to explore the potential of pre-operative handgrip exercise to improve the vein size and blood flow. We compared the efficacy of two types of handgrip exercises (conventional and modified) in healthy subjects.

Method

Thirty-two healthy volunteers (11 male, 21 female) were randomized into 2 types of handgrip exercises. The non-exercising hand served as the control. Both interventions followed the same protocol (30min/day for 6 weeks), except for the addition of wrist flexion in the modified group. Measurements of vessel diameter and blood flow rate were taken before and after 6 weeks of exercise.

Results

There is no significant difference between conventional and modified handgrip exercise when comparing the vessel diameter and arterial blood flow rate. When compared to their control counterpart, conventional exercise showed significant increment in distal cephalic vein (DCV) ($p=0.003$), proximal cephalic vein (PCV) ($p<0.001$), and brachial artery flow (BAF) rate ($p=0.025$). The modified handgrip exercise showed a higher percentage of increment in DCV and PCV when compared to the conventional group (34.5 vs 27.8%, 26.6 vs 21.1%) although not being statistically significant ($p=0.316$, $p=0.489$).

Conclusion

The conventional handgrip exercise with our proposed protocol could be implemented in ESRD patients before AVF creation. Further investigation is needed to evaluate pre-operative handgrip exercise towards the outcome of AVF maturation in patients.