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Abstract:

BACKGROUND: Proper vascular access is essential for the long-term survival of chronic haemodialysis patients. The preferred vascular access in terms of long-term function is the native arteriovenous fistula. The success of native arteriovenous fistula depends mainly on a sufficient vein diameter. Thus, any intervention that could increase vein diameter before arteriovenous fistula creation could improve its patency. We conduct a study to investigate the effect of local physical training, namely handgrip exercise, on the distal forearm cephalic vein diameter in patients with chronic renal disease.

MATERIAL AND METHODS: A total of 34 chronic renal disease patients (stage 3 and 4) were recruited in a randomized controlled trial. Handgrip exercise was performed for 8 weeks in the intervention group. Handgrip-strength measurement and distal forearm cephalic vein diameter of a non-dominant hand with and without tourniquet was recorded (measurement is taken 1 cm proximal to the radial styloid).

RESULTS: After 8 weeks, the mean cephalic vein diameter in the intervention group increased from 1.77 and 1.97 mm to 2.15 and 2.43 mm, without and with a tourniquet, respectively (p < 0.05). There is also a significant change in the mean diameter of distal forearm cephalic vein (p < 0.05) in the intervention group when measured in both the absence (mean change 0.39 ± 0.06 mm vs 0.01 ± 0.02 mm) and the presence of tourniquet (mean change 0.47 ± 0.07 mm vs 0.01 ± 0.01 mm). CONCLUSION: These findings suggest that non-invasive handgrip exercise can increase in the diameter of the distal forearm cephalic vein, thereby increasing the rate of successful arteriovenous fistula creation.

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