



To determine the effect of localised heat and oral hydration on vein diameter and depth” Sharp et al (2018).

Abstract:

BACKGROUND: Accessing the peripheral veins for blood sampling and short-term peripheral intravenous catheter insertion is common in contemporary healthcare. Clinicians may apply heat or promote oral hydration to increase vein diameter and reveal veins to improve success rates. However, there is limited research that has examined the effect of these interventions on vein diameter and depth.

OBJECTIVES: To determine the effect of localised heat and oral hydration on vein diameter and depth.

DESIGN: A three arm parallel randomised controlled trial was undertaken with 39 healthy participants from a University. All participants fasted from food and fluid from midnight. At 10 am the next day, a mark was made at the cephalic (120 mm proximal from the radial styloid) and median cubital veins (at cubital fossa) with non-permanent ink and participants underwent baseline vein diameter and depth measurement using ultrasound. Participants were randomised to either a control, heat or hydration group. Participants in the hydration arm consumed 1 L of room temperature tap water, those in the heat group had a wheat bag applied to the area for 10 min and those in the control group had no intervention and were asked to sit quietly. A second measurement was undertaken immediately after the heat

intervention and 1 h after the baseline measurement for those in the hydration and control groups.

RESULTS: The application of localised heat and oral hydration did not affect the depth of the cephalic vein. Whilst hydration had no effect on median cubital vein depth, the application of heat did make this vein more superficial compared to the control group ($p = 0.033$). The application of heat resulted in a statistically significant ($p = 0.006$) increase in cephalic vein diameter compared to the control group, this effect did not occur with the median cubital vein ($p = 0.087$). Oral hydration resulted in a reduction in the mean diameter of both veins. Compared to the control group, the average median cubital vein diameter decreased by 0.57 mm ($p = 0.003$; 95% CI -0.940 to -0.193) and the cephalic vein reduced by 0.33 mm ($p = 0.015$; 95% CI -0.593 to -0.064) after oral hydration.

CONCLUSION: The use of localised heat was inconsistent in its effect on vein diameter and depth. Oral hydration caused a reduction in vascular calibre in both the cephalic and median cubital veins. The promotion of water consumption to improve venepuncture success is not supported.

Reference:

Sharp, R., Childs, J., Bulmer, A.C. and Esterman, A. (2018) The effect of oral hydration and localised heat on peripheral vein diameter and depth: A randomised controlled trial. *Applied Nursing Research*. June 20th. .

doi: 10.1016/j.apnr.2018.06.013.

