

Comparison of the immediate effects of Graston Technique on subcutaneous hemodynamics within the triceps surae



Stanek, JM, Domitrz, B, Selkow, NM, Bush, H
School of Kinesiology & Recreation
Illinois State University



BACKGROUND

- Graston Technique is a common soft tissue mobilization technique used by many clinicians¹
- IASTM introduces micro-trauma to an area with soft tissue restrictions and may evoke an inflammatory response to stimulate fibroblast recruitment and connective tissue remodeling, promote scar tissue breakdown, and fascial adhesion release^{2,3,4}
- Numerous studies have supported these techniques for improving ROM and decreasing pain^{5,6}
- Limited evidence for IASTM on hemodynamics



PURPOSE & HYPOTHESIS

- Examine the acute effects of the GT protocol on blood flow changes of the triceps surae as well as compare those results with IASTM alone and a control group
- We hypothesized the GT protocol would show greater increases in blood flow when compared to both IASTM alone and no intervention

MATERIALS & METHODS

- Randomized, cohort study design
- 24 healthy participants (14 female, 10 males, ages 20.5±1.7 years, height 167.0±7.5cm, mass 62.4±17.2kg)
- Subcutaneous hemodynamic flow was measured using a wireless NIRS device (Portamon, Artinis Medical Systems, The Netherlands)
- Concentration changes were gathered at sample rate of 10 Hz for 2 minutes
- Light absorbance at 763 nm and 845 nm allowed for the calculation of superficial and deep hemodynamics utilizing the modified Lambert-Beer Law
- Participants randomized to either control, IASTM, or GT group
 - IASTM and GT group received same instrument tx
 - GT completed stretching and exercise following tx
 - Control group received no tx

Key Points

1. Various instrument assisted soft-tissue mobilization (IASTM) techniques claim to improve blood flow following their application.
2. Little to no evidence exists to the efficacy of improving blood flow with the use of IASTM.
3. While a stand-alone IASTM treatment showed improvements in superficial blood flow, only the Graston Technique[®] demonstrated significant increases in blood flow to the triceps surae.

RESULTS

Group	Superficial Oxygenated	Superficial Deoxygenated	Superficial Total Hemoglobin
GT	8.66 ± 6.45*	5.60 ± 6.98	14.25 ± 12.70
IASTM	6.56 ± 8.43	5.55 ± 8.46	12.11 ± 15.67
Control	-0.36 ± 6.44	2.72 ± 4.27	2.37 ± 9.85

Group	Deep Oxygenated	Deep Deoxygenated	Deep Total Hemoglobin
GT	7.90 ± 6.79*	5.14 ± 6.83	13.04 ± 12.86
IASTM	5.93 ± 7.72	4.86 ± 7.55	10.78 ± 14.21
Control	-0.52 ± 5.57	2.28 ± 3.78	1.76 ± 8.69

* Significant difference from control group

DISCUSSION & CONCLUSIONS

- GT significantly increased oxygenated hemoglobin
- Blood flow did increase in the IASTM group, however, it failed to reach statistical significance
- Improved circulation and tissue perfusion is a common claim for utilizing IASTM to improve microcirculation, cellular repair, granulation and angiogenesis¹
- These findings are partially supported by this study, however, the stretching and exercise may play a larger role in increasing tissue hemodynamics

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