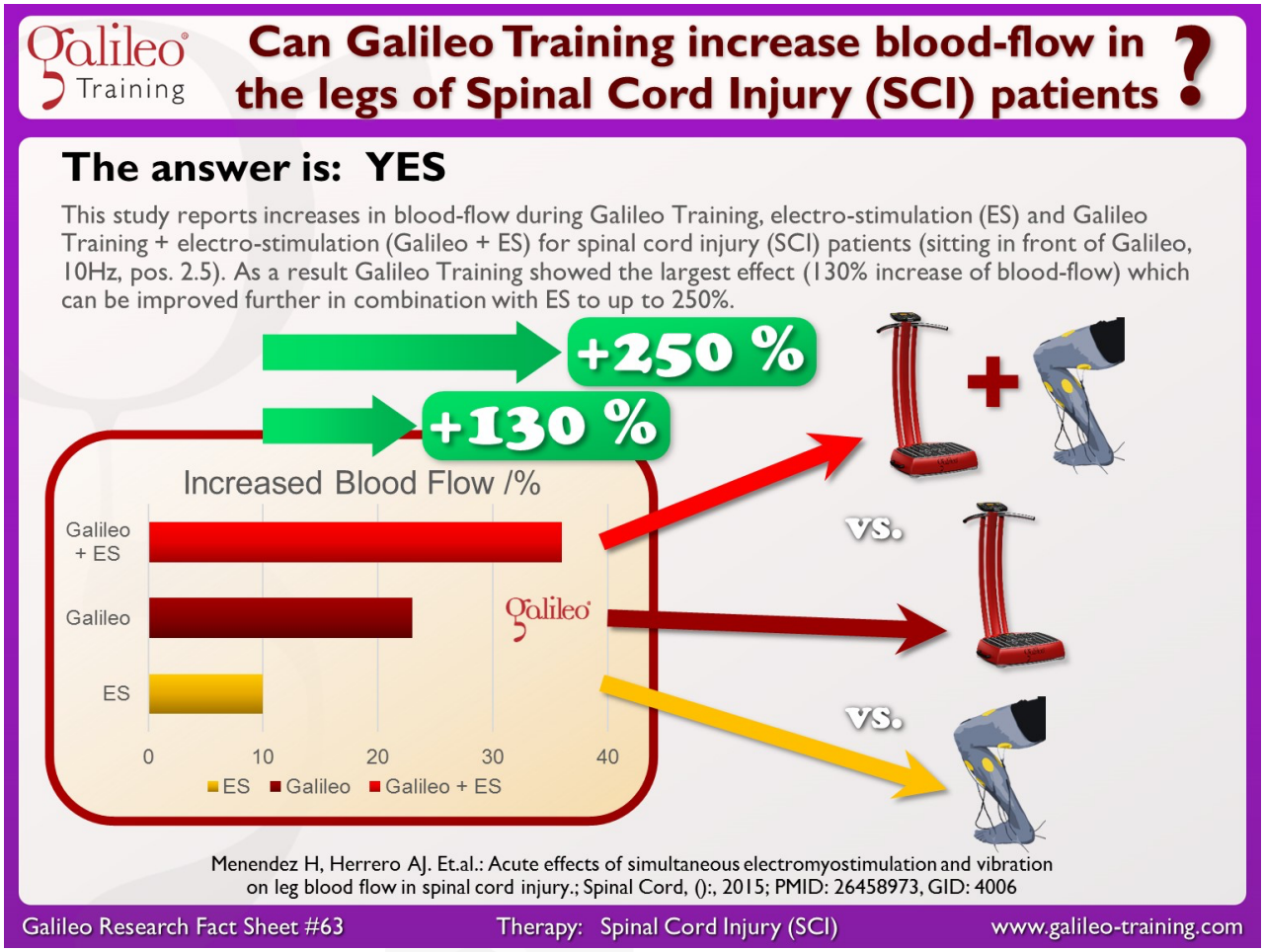

Can Galileo Training increase blood-flow in the legs of Spinal Cord Injury (SCI) patients?

This study examined the effects of Galileo Training on increase of blood flow in spinal cord injury (SCI) patients and compared it with electro stimulation and the combination of both. The patient sat in front of the Galileo device and only put their feet on the Galileo (10Hz, Foot Position 2.5mm, 10 Minutes). As a result, Galileo Training alone showed a 130% increased blood flow compared to electro stimulation but the combination of both showed an increase of 250%. The positive effect of Galileo Training on blood flow has been shown before (#GRFS24, #GRFS21, #GRFS20), but this study showed an interesting effect when combining Galileo Training with electro stimulation: Galileo Training at frequencies of about 10Hz and higher mainly uses the stretch reflex to activate the muscles (Mechano-Stimulation).

To get a reflex-based muscle activation the user needs a pretension on the muscle. Therefore a relaxed muscle will not create a reflex. In typical situations (e.g. Standing on the Galileo) this pre-activation is created by the postural system which reacts on the spinal cord level and works against gravity (therefore some SCI patients can even stand on a Galileo device at higher frequencies (>20Hz) without support, because the stretch reflex activates the joint muscles and helps them to stand). Now in sitting obviously the muscle of the legs are more or less relaxed therefore the effect of the vibration is more limited.

By adding electro stimulation, it will activate pre-tension that helps to trigger the stretch reflex by the Galileo Training and therefore causes an significantly increased effect…

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Acute effects of simultaneous electromyostimulation and vibration on leg blood flow in spinal cord injury.

Menéndez H[1,2], Ferrero C[1,2], Martín-Hernández J[2], Figueroa A[3], Marín PJ[4], Herrero AJ[1,2].

Abstract

STUDY DESIGN:

Randomized crossover.

OBJECTIVES:

To analyze the acute effects of isolated and simultaneous application of whole-body vibration (WBV) and electromyostimulation (ES) on popliteal artery blood velocity (BV) and skin temperature (ST) of the calf in subjects with spinal cord injury (SCI).

METHODS:

Ten subjects with SCI were assessed in five different sessions. After a familiarization session, four interventions were applied in random order; WBV, ES, simultaneous WBV and ES (WBV+ES), and 30 s of WBV followed by 30 s of ES (WBV30/ES30). Each intervention consisted of 10 sets × 1 min ON+1 min OFF. Subjects were seated on their own wheelchairs with their feet on the vibration platform (10 Hz, 5 mm peak-to-peak), and ES was applied on the gastrocnemius muscle of both legs (8 Hz, 400 μs).

RESULTS:

The simultaneous application (WBV+ES) produced the greatest increase in mean BV (MBV; 36% and 42%, respectively) and peak BV (PBV; 30% and 36%, respectively) during the intervention. This intervention produced the greatest mean increases in MBV (21%) and PBV (19%) during the recovery period. Last, this intervention produced the highest increase in ST during the intervention (2.1 °C).

CONCLUSION:

The simultaneous application of WBV+ES seems to produce a greater increase in MBV and PBV of the popliteal artery and ST of the calf than the isolated (WBV or ES) or consecutive application of both stimuli (WBV30/ES30). This study provides an efficient therapeutic methodology to improve peripheral arterial properties, which is pivotal in SCI patient's rehabilitation.

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