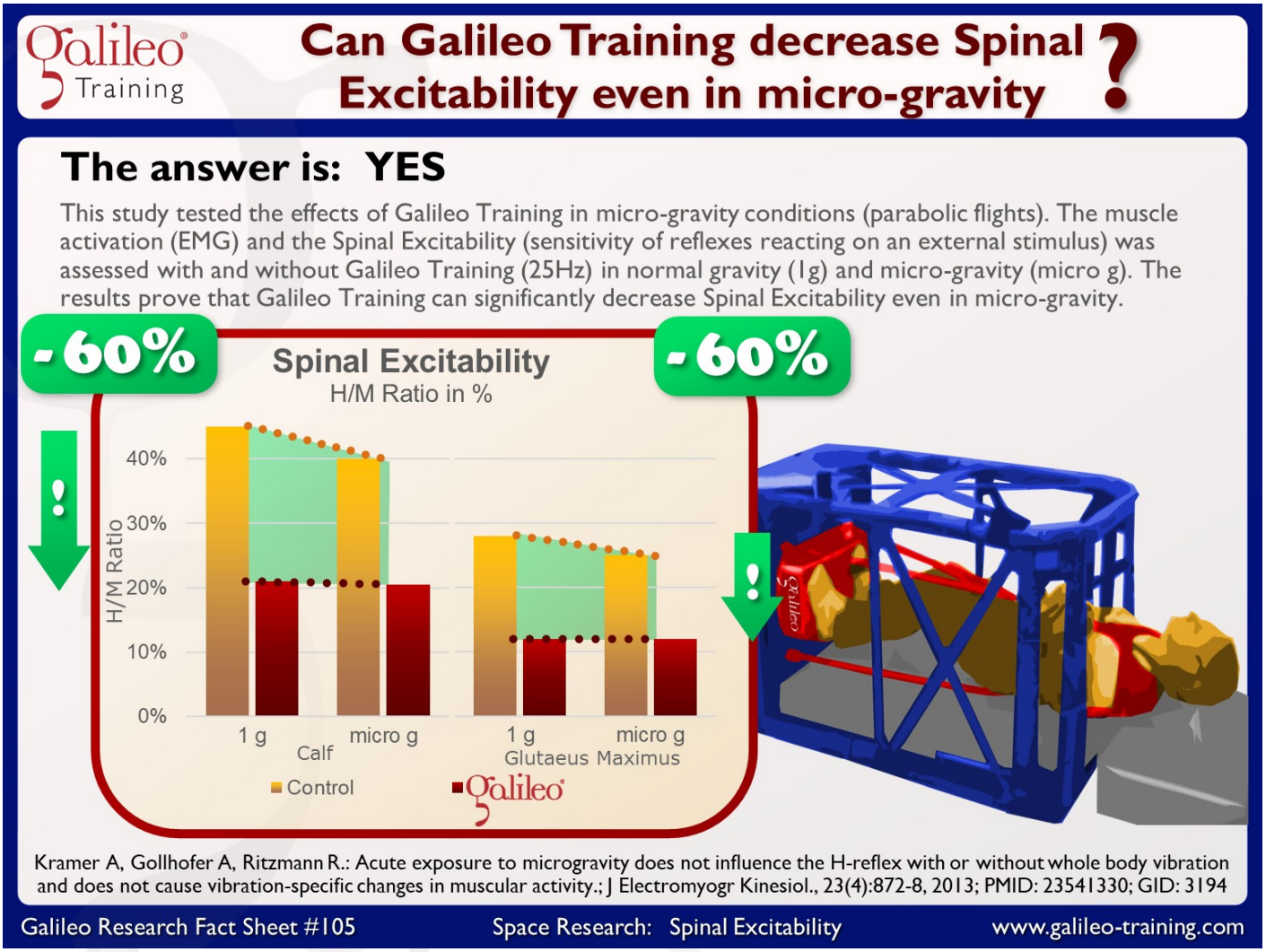

The same study as in #GRFS104 did not only assess muscle activation (EMG) but also Spinal Excitability (H/M Ratio) during Galileo Training in micro-gravity (parabolic flights).

The study was performed during the 14th parabolic flight campaign of the German Space Agency (DLR) in 2009, which was already the second campaign Galileo Training was used in.

During parabolic flight, the airplane (Airbus A300 Zero-G) follows the trajectory of a thrown ball.

During this path a 20 second period of micro-gravity which is repeated about 30 times per flight.

The Spinal Excitability is the sensitivity of the reflexes reacting on an external stimulation.

J Electromyogr Kinesiol. 2013 Aug;23(4):872-8. doi: 10.1016/j.jelekin.2013.02.010. Epub 2013 Mar 27.

Acute exposure to microgravity does not influence the H-reflex with or without whole body vibration and does not cause vibration-specific changes in muscular activity.

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PURPOSE:

Many potential countermeasures for muscle and bone loss caused by exposure to microgravity require an uncompromised stretch reflex system. This is especially true for whole body vibration (WBV), as the main source of the neuromuscular activity during WBV has been attributed to stretch reflexes. A priori, it cannot be assumed that reflexes and Ia afferent transmission in particular have the same characteristics in microgravity as in normal gravity (NG). Therefore, the purpose of the study was to compare Ia afferent transmission in microgravity and NG and to assess how microgravity affects muscle activity during WBV.

METHODS:

In 14 participants, electromyographic activity of four leg muscles as well as Hoffmann-reflexes were recorded during NG and microgravity induced by parabolic flights.

RESULTS:

The size of the Hoffmann-reflex was reduced during WBV, but did not differ during acute exposure to microgravity compared to NG. The influence of the gravity conditions on the electromyographic activity did not change depending on the vibration condition.

CONCLUSIONS:

As far as the electromyographic activity of the recorded leg muscles is concerned, the effect of WBV is the same in microgravity as in NG. Moreover, Ia afferent transmission does not seem to be affected by acute exposure to microgravity when subjects are loaded with body weight and postural sway is minimized.

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