

# The Spinal Cord Is A Promising Alternative To The Brain For The Application Of Direct Current Stimulation In Supporting Balance Abilities: A Randomised Placebo-Controlled Trial.

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## Extended Abstract

Balance and postural control are complex sensorimotor functions controlled by the integrated brain and spinal network [1,2]. Nevertheless, the existing application of non-invasive brains stimulation in supporting these abilities focused on the primary motor cortex (M1). This crossover-study compares the effects of direct current stimulation (DCS) over (i) the (M1), (ii) the cerebellum and (iii) the spinal cord [3]. Overall forty-two healthy young subjects were enrolled. Twenty minutes of anodal 1.5 mA DCS over (i) the M1, (ii) the cerebellum, and (iii) the spinal cord, as well as (iv) sham DCS were applied in a randomized order. The balance performance of either leg was tested immediately prior to and after each intervention using the Y Balance Test, the Single Leg Landing Test, and the Single Leg Squat Test. Significant improvement after 1.5 mA DCS over each region in comparison to sham DCS was detected by the Y Balance Test. While spinal DCS improved the balance ability of both legs, M1 and cerebellar DCS supported right leg stand only. No significant effects were detected by Single Leg Landing and Single Leg Squat Tests [3]. Our results show that spinal DCS is a promising alternative to M1 and cerebellar DCS in supporting balance and postural control for healthy people and support the investigation of these protocols in disabled cohorts.

## References

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