



**Pulsed electromagnetic field therapy reduces delayed onset muscle soreness in marathon runners**

*a double-blind randomized placebo-controlled study*

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# EFORT Abstract Submission

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**Pulsed electromagnetic field therapy reduces delayed onset muscle soreness in marathon runners. A doubleblind randomized placebo-controlled study.**

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**INTRODUCTION:** Delayed onset of thigh muscle soreness (DOMS) is frequent in marathon runners. Pulsed electromagnetic field therapy (PEMF) is reported to reduce pain in different indications. At EFORT 2011 we presented a pilot study indicating a possible effect on DOMS.

**OBJECTIVES:** The purpose of this study was [VK1] to investigate if PEMF can reduce DOMS in a larger cohort of marathon runners. Primary outcome was pain and secondary outcome was running activity

**METHODS:** The design of this study was a double blind, randomized placebo-controlled study covering a 5 days period after completion of a marathon race. Following 4 marathon races all runners that completed the 42.195 km were asked to participate in the study. A total of 439 runners were enrolled to 4 marathon races and were eligible, 94 were excluded and 133 marathon runners were randomly assigned to either PEMF or placebo therapy. The intervention group received an active pulsed electromagnetic field device, and the control group received a deactivated placebo device. Active and placebo devices were identical. Placebo devices were used in exactly the same manner as the active devices but produced no electromagnetic field into the tissue. The pulsed electromagnetic field device does not produce heat or cause any sensation in the tissue and thereby blinding the participants to treatment. The pulsed electromagnetic field signals were 2-msec burst of 27.12-MHz sinusoidal waves every second. Peak magnetic field was 0.05 G, which induced an average electric field of 10 mV / cm in the muscle with an effect of 7.3 mW / cm<sup>3</sup>. All subjects were told to use the device 20 minutes four times each day and place the device on the most painful area on the quadriceps. Pain intensity was evaluated three times a day with a Visual Analogue Scale (VAS) during a 90° squat with a self-administered questionnaire and described with area under curve (AUC). Running activity was registered.

**RESULTS:** Compliance was 70 %. In the active group 36 men and 10 women returned the questionnaire and in the placebo group 42 men and 5 women returned the questionnaire. There was no difference in demographics between the analysed active and placebo group. The areas under the curves of the two groups showed a significantly lower area under curve for the active therapy group compared to the placebo therapy group (P = 0.024). The VAS scores were significantly lower in the active therapy group at day 1 noon (P = 0.043), day 1 evening (P = 0.042) and day 2 evening (P = 0.028). Furthermore the active therapy group ran 61 (53-78) minutes 1 day after the marathon compared to 27 (18-36) minutes in the placebo therapy group (P = 0.017).

**CONCLUSION:** This study demonstrates that PEMF can reduce DOMS in marathon runners in the days following a marathon race. The increased running time in the active therapy group 1 day after the marathon race supports these findings.

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**Disclosure of Interest:** None Declared