

The effect of thumbtack needle stimulation in sports field

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We provide acupuncture treatment for athletes not only for sports injuries, but also for their optimum condition or better performance. It is mostly used after training or competition for faster recovery from fatigue, soreness, or pain. We also have been examining if acupuncture stimulation prior to exercise can prevent or minimize fatigue, or even increase performance.

In this presentation, I will introduce the effect of thumbtack needle (TN) which can be attached during exercise for 1) Delayed Onset Muscle Soreness (DOMS) and 2) isokinetic exercise.

1) 149 participants for triathlon race (Olympic distance: swim 1.5, bike 40km, run 10km) were attached either TN (Seirin Pyonex, 0.6mm) or sham (only adhesive tape) on BL23, BL24, BL25, BL26 and BL32 before the race. Visual Analog Scale (VAS) was used to assess their muscle soreness of the back and lower extremities at pre-race (PRE), immediately after the race (POST1), and the day after the race (POST2). VAS significantly increased at POST1 compared to PRE in both group ($p < 0.01$). VAS of POST2 were decreased compared to POST1 ($p < 0.05$) in TN group, while sham group kept as high as POST1. It was suggested that DOMS was suppressed by the use of thumbtack needles during the triathlon race.

2) 16 triathletes participated in the study. Biodex System3 was used for isokinetic exercise of the knee extension/flexion. The angular velocity was 60 degree/sec and subjects performed 5 sets of 30 repetition of unilateral knee exercise. Subjects were randomly divided into 2 groups for receiving TN (Seirin Pyonex, 0.6mm) on BL23, BL24, BL25, BL26 and BL32, or Regular Needle (RN:Seirin J type, 60mm*0.25mm) on BL24 and BL26 prior to the exercise. Acupoints were selected as same level of spinal nerve innervation as knee extensor and flexor, but TN and RN were penetrated into different depth, 0.6mm for TN, 20mm for RN where subcutaneous tissue and muscle were located respectively. RN was left for 5 minutes and removed. TN remained on the skin during the exercise. The same exercise without any stimulation was performed as control (CONT) on different side of the stimulated leg. Peak torque (PT), total work (TW), the work of first 1/3 (F1/3) and latter 1/3 (L1/3), mean power output (MP) were evaluated. As the result, for intragroup comparison, PT, TW, F1/3, MP of 5th set were decreased compared to 1st set in CONT ($p < 0.05$) at flexion exercise. TW and F1/3 of 5th set were decreased compared to 1st set in TN and RN ($p < 0.05$). For intergroup comparison, PT, TW, F1/3 and MP of RN were lower compared to CONT at 1st set of extension exercise ($p < 0.05$). MP of RN were decreased compared to TN at 5th set ($p < 0.05$). It was suggested that the decreased muscular output were caused from acupuncture stimulation into the muscle with RN. The continuous stimulation on subcutaneous tissue with TN during exercise seems to sustain mean power output. Acupuncture insertion into different depth may lead different effects on isokinetic exercise.

Keyword: thumbtack needle, DOMS, isokinetic exercise