Low-frequency Electro-Acupuncture and Physical Exercise Decrease High Muscle Sympathetic Nerve Activity in Polycystic Ovary Syndrome

Conclusions: For the first time we demonstrate that low-frequency EA and physical exercise lowers high sympathetic nerve activity in women with PCOS.

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Context: We have recently shown that polycystic ovary syndrome (PCOS) is associated with high muscle sympathetic nerve activity. Animal studies support the concept that low-frequency electro-acupuncture (EA) and physical exercise, via stimulation of ergoreceptors and somatic afferents in the muscles, may modulate the activity of the sympathetic nervous system. Objective: The aim of the present study was to investigate the effect of these interventions on sympathetic nerve activity in women with PCOS.

Design: Randomized controlled trial.

Setting: Sahlgrenska University Hospital, Gothenburg, Sweden.

Outcome Measures and Subjects: Twenty women with PCOS were randomly allocated to one of three groups; low-frequency EA (n=9), physical exercise (n=5) or to an untreated control (n=6) group during 16 weeks. Direct recordings of multiunit efferent postganglionic muscle sympathetic nerve activity (MSNA) in a muscle fascicle of the peroneal nerve before and following 16 weeks of treatment. Biometric, hemodynamic, endocrine and metabolic parameters were measured.

Results: Low-frequency EA (P = 0.036) and physical exercise (P = 0.030) decreased MSNA burst frequency compared to the untreated control group. Low-frequency EA group reduced sagittal diameter (P = 0.001), while physical exercise group reduced body weight (P = 0.004) and body mass index (BMI) (P = 0.004) as compared to the untreated control group. Sagittal diameter was related to MSNA burst frequency (Rs = 0.58, P < 0.005) in the EA group. No correlation was found for BMI and MSNA in the exercise group. There were no differences between the groups in hemodynamic, endocrine and metabolic variables.

Conclusions: For the first time we demonstrate that low-frequency EA and physical exercise lowers high sympathetic nerve activity in women with PCOS. Thus, treatment with low-frequency EA or physical exercise with the aim to reduce MSNA may be of importance for women with PCOS.

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