SWACSM Abstract

Local sweating response to varying intradermal electrical stimulation patterns

GARY MACK

Department of Exercise Sciences, Brigham Young University, Provo, UT

Category: Professional

Presenter: Mack, Gary (gary_mack@byu.edu)

ABSTRACT

The local sweat rate response (LSR) to intradermal electrical stimulation generates a sigmodal stimulus-response curve with a peak sweat rate generated by a 30 s period of continuous stimuli at a frequency of 8-16 Hz. The firing pattern of the sudomotor nerve driving sweat gland function in vivo, however, display a bursting firing pattern. **PURPOSE:** To compare the LSR to a 30 s continuous intradermal electrical stimulation frequency to a 30 s bursting pattern with a similar total number of stimuli. We hypothesize that there would be no difference in the LSR response between the two stimuli patterns. **METHODS:** Subjects (n=5) were studied seated in a temperature-controlled room at 27°C. The LSR was measured with a miniature sweat capsule with guide sleeves for holding the intradermal stimulating electrodes. The air flow through the capsules was set at 100 ml/min. The water content of the effluent air was calculated by measuring the relative humidity (RH) and air temperature. The 10 continuous stimulus frequencies were 1, 2, 4, 6, 8, 10, 12, 16, 32, and 64 Hz. The bursting stimuli contained a similar total number of stimuli with a burst interval of ≈ 1.5 sec. The LSR was determined by the area under a 30 s sweat rate-time curve. **RESULTS:** The non-linear sigmoidal plots were significantly different ($p = 0.0006$) from each other with continuous stimuli resulting in a slightly greater peak response than the bursting pattern. **CONCLUSION:** These data do not support the hypothesis that a varied bursting pattern will improve sweat gland output during electrical activation of the sudomotor nerve.