The effect of electrical stimulation on a normal skin blood flow in active young and older adults

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Abstract
BACKGROUND:
Electrical stimulation (ES) shows promising results in increasing healing of decubitus ulcers. Recent studies show that skin blood flows (SBFs) are enhanced if the subject is exposed to a warm environment during treatment. The purpose of this investigation was to determine if blood flow would increase with ES in a physically active older population without wounds in a warm environment.

MATERIAL/METHODS:
Twenty-two healthy physically active males were divided into a young group (YG) (N=15, age=32.1 +/- 8.3 years) and an older group (OG) (N=8, age=64.5 +/- 6.2 years). ES (30 Hz, pulse width 250 microsec and maximum current of 15 mA) was applied on the right thigh for 15 minutes with the subject in a thermoneutral (25 +/- 0.5 degrees C) and a warm (35 +/- 0.5 degrees C) environment on two days. Skinblood flow was monitored by Laser Doppler Imager. Tympanic temperature, sweat rates, and skin temperatures were monitored on the forehead, chest, and both thighs during the experiment to assess autonomic stress.

RESULTS:
The skin temperatures and sweat rates were significantly higher in the YG than OG in the warm environment, with no differences found in the thermoneutral environment. In the warm environment, the SBFs were significantly different between pre, during, and post ES in both groups, and no difference was found between the two groups in either environment.

CONCLUSIONS:
The environment temperatures modulate the SBF response to ES. Global heat improves the SBF response to ES in non wounded skin in active young and old groups.