

Electrophysiological aspects of galvanic skin response during reduced physical effort

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Abstract

Background. The electric impedance of the skin (or galvanic skin response-GSR) is a measurement concerning the resistance of the skin to the passage of an electric current. It is determined especially by the superficial stratum corneum of the skin and is influenced by the activity of the sweat glands. The GSR is an electrophysiological measurement which could reveal important information about the health state of the body.

Aims. The study tries to evaluate the correlation between the GSR and moderate physical effort and to evaluate the possible association with one's cardiovascular adaptation to effort.

Methods. We collected data from 33 male participants without any pathological history, aged 19+/-2 years. They were subjected to a moderate physical effort of 25 Watts using an ergonomic bicycle, for 50 seconds. During this time the variation GSR was measured. Also, the GSR was recorded 10 seconds before effort and 10 seconds after effort. For measurement, a digital multimeter with PC interface was used. Subjects were applied the Ruffier test, to investigate the cardiovascular adaptation to effort.

Results. It was found that during the rest periods, GSR remained roughly constant. With the onset of effort, GSR decreased rapidly and linear in the first 10 seconds, then remained constant until the end of the experiment. Dropping the GSR during the effort was made with an average slope of -5.81 ± 12.32 . There was no correlation with the Ruffier index.

Conclusions. GSR decrease is probably due to the rapid reaction of the sudoripary glands, which are filled with secretion fluid. The abruptness with which the GSR decreases depends on the reactivity of the sudoripary glands, which cannot be influenced by the degree of cardiovascular adaptation to effort.

Key words: galvanic skin response.