

Psychophysiological Response and Fine Motor Skills in High-Altitude Parachute Jumps

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Abstract

We analyzed the psychophysiological response and specific fine motor skill of an experienced jumper in HALO (high altitude low opening) and HAHO (high altitude high opening) parachute jumps. Eight HALO and eight HAHO jumpers were analyzed. They jumped at 5500 m, HALO jumpers opened the parachute at 500 m and HAHO jumpers at 4300 m of altitude. Before and after the jumps, parameters of muscle strength, cortical arousal, blood creatine kinase (CK) and glucose, blood oxygen saturation, rate of perceived exertion (RPE), and specific fine motor skills of an experienced jumper were assessed; during the jump, heart rate (HR), HR variability, and speed were evaluated. HALO and HAHO jumps produced a significant increase in CK, lactate, and RPE, and a decrease in glucose. HAHO decreased cortical arousal, presented a higher sympathetic modulation, and a higher HR during the jump than HALO. HALO and HAHO produced an increase in the physiological, sympathetic modulation and muscle destruction, and a decrease in cortical arousal and a higher blood lactate concentration only in the HAHO jump. Also, somatic and cognitive anxiety correlated with higher strength manifestation and muscle destruction. This novel research could be used to improve actual training systems in both civil and military parachute jumpers.

Keywords

Anxiety, Autonomic Modulation, Cortical Arousal, Fine Motor Skill, War Fighter