The increase in systolic and diastolic blood pressure after exposure to cryogenic temperatures in normotensive men as a contraindication for whole-body cryostimulation

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Abstract

1.

   The changes which occur in a human body subjected to cryogenic temperatures are still not completely understood. Thus the aim of this study was to evaluate changes in blood circulation induced by a single exposure to very low temperature during whole-body cryostimulation of young and clinically healthy male subjects. Prior to the study, candidates underwent a medical examination in order to eliminate individuals with contraindications towards cryostimulation.

2.

   The study included 40 young men aged 22±0.7 years, average body weight 76.65±7.8 kg and height 175.5±7.2 cm. The participants were exposed to extremely low temperatures in a cryogenic chamber. Each session lasted for 3 min at −130 °C and was preceded by 30 s of adaptation in a vestibule at −60 °C. Blood pressure and heart rate were measured before entering the chamber, immediately after exiting, and 10 and 20 min after exiting.

3.

   Our results showed a significant increase in systolic blood pressure after cryostimulation (by an average of 21 mmHg in comparison with the initial level before cryostimulation) and an increase in diastolic blood pressure after the cryostimulation (by 9 mmHg). The increase in systolic blood pressure was accompanied by a significant decrease in heart rate (by about 10 bpm). Cryostimulation of thewholebody is a stress factor and a stimulus for the body which significantly increases systolic blood pressure, but the changes are temporary and not harmful for normotensive individuals.

Keywords

- Cryostimulation; Blood pressure; Heart rate; Cardiovascular response

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