

Can meditation influence the autonomic nervous system? A case report of a man immersed in crushed ice for 80 minutes.

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Background: The autonomic nervous system responds independently, autonomously and automatically to changes in the homeostasis of the cardiovascular system and thermoregulation. However, the world record holder of full-body ice immersion claims he can influence his autonomic nervous system through the Asian Tummo meditation technique, which is associated with descriptions of intense sensations of body heat. We, therefore, assessed the cardiovascular and thermoregulatory responses to full-body ice immersion in this individual.

Methods: A 51 year old male was fully immersed in crushed ice for 80 minutes whilst performing Asian Tummo meditation. Blood pressure and heart rate were measured continuously using an automatic blood pressure device. Core body and skin temperature were measured continuously using an ingestible telemetric temperature pill and wireless sensors, respectively. Oxygen consumption was measured using pulmonary gas exchange every 30 minutes.

Results: Core body temperature during the 80-minute ice immersion period decreased gradually from 37.7 to 37.1°C. Skin temperature decreased at the upper limbs from 28 to 5°C and at the lower limbs from 28 to 18°C. No immediate blood pressure or heart rate response at the beginning of full-body ice immersion was observed. Over the full 80-minute ice immersion period, blood pressure gradually increased from 128/84 to 163/97 mmHg and heart rate from 70 to 90 bpm. Oxygen consumption doubled from 5.7 at baseline to 11.0 ml/min/kg during immersion and remained stable.

Conclusions: No immediate blood pressure and heart rate responses were observed, as typically observed when (partially) submerged into ice(water). Despite 80 minutes of full-body ice immersion and significant heat loss through the skin, core body temperature was maintained probably by an increased energy expenditure (and therefore heat production). This individual may have influenced the autonomic nervous system, thereby actively regulating the cardiovascular system and thermoregulation.

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