Keywords: coronary artery disease, immersion, water therapy

Abstract

PURPOSE: Water is frequently recommended as a therapeutic medium for cardiac patients. Reports on the cardiovascular response to immersion often differ, however, depending, for instance, if full or partial immersion were considered. The purpose of this study was to examine the cardiovascular responses to 2 immersion protocols in 3 age and gender-matched groups of patients each with a specific coronary artery disease.

METHODS: Fifteen patients with coronary artery disease entered water using a stepwise immersion (STEP) protocol (5 stages in 15 minutes) and an immediate, complete immersion (IM) protocol (2 stages in 6 minutes). Cardiac indices were monitored by transthoracic echocardiography. The heart rate was generated from the electrocardiogram, and blood pressure was measured using a manual mercury manometer.

RESULTS: The end-diastolic volume, end-systolic volume, stroke volume, and cardiac output decreased during STEP but increased during IM. As a consequence, the preload on the heart was greater during IM. Changes in systolic blood pressure were comparable in the 2 situations. The immersion-related decrease of heart rate was seen during STEP, but not during IM. Nevertheless, the hemodynamic responses to the initial stages of STEP up to the ankle joint were quite similar to those observed during immediate immersion to the neck.

CONCLUSION: The cardiovascular responses to IM and STEP differed between protocols and even among subgroups within the same protocol. The findings further suggest that isolated immersion of body extremities can be beneficial to patients with coronary artery disease as preliminary preparation before complete water immersion is undertaken.
Cardiovascular responses during thermoneutral, head-out water immersion in patients with coronary artery disease.

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MEDLINE record details

Publication Type: Journal Article
ISSN: 1932-7501
Country: United States
Language: eng
Date of Entry: 20070611
Unique Identifier: 17558242
Physical strain during CPR-Comparing 30:2 versus 15:2
Sebastian Russo, S. Reinhard, A. Timermann, C. Eich, A. Niklas, B. Graf
Resuscitation
August 2006 (Vol. 70, Issue 2, Page 316)
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