

Advanced Search (beta)

Limits Preview/Index History Clipboard Details

Display AbstractPlus Show 20 Sort By Send to

All: 1 Review: 0

1: Br J Sports Med. 2007 Jul;41(7):425-9. Epub 2007 Jan 29.

Final Version Br J Sports Med Links

Changes in muscle temperature induced by 434 MHz microwave hyperthermia.

Ichinoseki-Sekine N, Naito H, Saga N, Ogura Y, Shiraishi M, Giombini A, Giovannini V, Katamoto S.

Institute of Health and Sports Science & Medicine, Juntendo University, Hiragagakuendai, Inba, Chiba, Japan. noriko.sekine@sakura.juntendo.ac.jp

OBJECTIVE: To investigate the changes in temperature of human muscle during microwave hyperthermia. METHODS: Skin surface and muscle temperatures were measured in 11 healthy adult men (mean (SD) age 24.3 (2.2) years; height 174.2 (6.1) cm; weight 70.0 (5.3) kg) during a 30 min exposure of the thigh to 434 MHz microwave hyperthermia. Skin temperature was maintained at the pilot temperature of 40 degrees C, and the temperature of the water in the bolus was 38 degrees C. The peak power output was set at 60 W and controlled automatically to maintain the pilot temperature. The temperature was measured in the vastus lateralis muscle at an average muscle depth of 2.0 (0.2) cm, using a 23 G Teflon-shielded thermocouple. Biopsy specimens were obtained for light microscopy from three subjects. A muscle-equivalent phantom was used to evaluate the vertical heating pattern. RESULTS: Both skin and muscle temperatures increased from baseline, and muscle temperature was higher than skin temperature (skin temperature 39.2 (0.5) degrees C, temperature rise 5.0 (1.5) degrees C; muscle temperature 43.7 (0.8) degrees C, temperature rise 8.9 (1.4) degrees C). At the end of the hyperthermia treatment, muscle temperature decreased to 39.8 (0.9) degrees C, but was still 4.8 (1.5) degrees C higher than the baseline. No signs of muscle damage were observed on the basis of the blood creatine kinase activity and histological sections. CONCLUSIONS: The results show that the 434 MHz microwave hyperthermia treatment increased and maintained muscle temperature locally by 6.3-11.4 degrees C without muscle damage. These findings suggest that the microwave hyperthermia system provides effective and safe treatment.

PMID: 17261552 [PubMed - indexed for MEDLINE]

Related Articles

Microwave hyperthermia treatment increases heat shock proteins in [Br J Sports Med. 2007]

An easy-to-use microwave hyperthermia system combined with spatially resolved MR temperature maps: phantom and animal studies. [J Surg Res. 2006]

Effects of hyperthermia on the rat bladder: a pre-clinical study on thermometry and functional damage [Int J Hyperthermia. 2003]

Simultaneous superficial hyperthermia and external radiotherapy: report of thermal dosimetry and tolerability [Int J Hyperthermia. 1999]

Temperature mapping in the canine prostate during transurethrally-applied local microwave hyperthermia. [Prostate. 1992]

» See all Related Articles...

Display AbstractPlus Show 20 Sort By Send to

Write to the Help Desk

NCBI |.nlm.nih.gov | NIH

Department of Health & Human Services

Privacy Statement | Freedom of Information Act | Disclaimer