Medicine & Science in Sports & Exercise
Issue: Volume 40(5) Supplement 1, May 2008, p S352

Publication Type: [D-35 Free Communication/Poster - Occupational Physiology and Medicine: Physiological Stresses and Demands: MAY 29, 2008 1:00 PM - 6:00 PM: ROOM: Hall B]
DOI: 10.1249/01.mss.0000323411.01038.58
ISSN: 0195-9131
Accession: 00005768-200805001-02176

[D-35 Free Communication/Poster - Occupational Physiology and Medicine: Physiological Stresses and Demands: MAY 29, 2008 1:00 PM - 6:00 PM: ROOM: Hall B]

Relation Between OMNI-RPE And Heart Rate Wearing Running Clothes VS. Firefighter Ensembles During Treadmill Exercise: 1999: *Board #163* May 29 3:30 PM - 5:00 PM

Coca, Aitor[1]; Sinkule, Edward J.[1]; Powell, Jeffrey B.[2]; Roberge, Raymond J.[1]; Williams, W. Jon[1]

Author Information

[1]NPPTL/NIOSH, Pittsburgh, PA. [2]EG&G, Pittsburgh, PA.
Email: esq6@cdc.gov
(No relationships reported)

OMNI rating of perceived exertion (OMNI-RPE) scales are used to assess exercise intensity and subjects' exertion. RPE has been compared with heart rate (HR) and has demonstrated a high correlation. Firefighting involves factors [e.g., heat and personal protective equipment (PPE)] affecting HR and perception of exertion. Firefighters usually have a higher HR due to those factors, but the question remains: do they perceive higher exertion associated with the higher HR?

PURPOSE: This study compares OMNI-RPE and HR during treadmill exercise wearing running clothes or firefighter ensembles.

METHODS: Ten active men (n=7) and women (n=3) performed three treadmill exercise sessions on separate days. The first session consisted of a maximal graded exercise test (GXT) wearing running clothes, followed by two sessions that consisted of treadmill walking at 50% of the subjects' maximal oxygen consumption wearing a standard firefighter ensemble (SE) or a prototype ensemble (PE) with modifications for additional chemical/biological protection. Overall body RPEs and HR were recorded during the exercise.

RESULTS: A repeated measure ANOVA revealed no significant differences on mean OMNI-RPE between GXT (3.8, between easy and somewhat easy) and SE (4.0, somewhat easy) or PE (3.3, between easy and somewhat easy) at 80% of subjects' HRmax (determined from their GXT). Significant differences were noted on mean OMNI-RPE between GXT (5.0, between somewhat easy and somewhat hard) and both SE (6.2, between somewhat hard and hard) and PE (6.0, somewhat hard) at 90% of subjects' HRmax. The three sessions showed a high correlation (r=0.92 to 0.98) between RPE and HR.

CONCLUSIONS: The data suggest that subjects' exertion ratings were not affected by wearing clothes that imposed an additional stress (SE and PE) at moderate-tohigh intensity exercise (80% HR). However, exercising at a higher intensity (90% HR), subjects felt it was harder to walk wearing either of the ensembles compared to the GXT. Throughout all three sessions, subjects' exertion ratings were lower than expected for the HR at which they worked. These results support previous observations that HR is not a strong physiological predictor of exertional perceptions and extend this observation to periods of high cardiovascular stress while wearing PPE.