

Reviewer's report

Title: Cooling via one hand improves physical performance in heat-sensitive individuals with Multiple Sclerosis: a preliminary study.

Version: 1 **Date:** 11 February 2008

Reviewer: helen Dawes

Reviewer's report:

Overall

This is a very interesting study examining the effects of hand cooling on exercise tolerance in people with MS. This study is of interest to the readership. The study merits publication, but there are limitations to the design that are not fully discussed. The limitations should more clearly be discussed prior to publication. My main concerns are a lack of adequate placebo control for the intervention - participants would have been aware of the intervention as would the researcher. When considering the effect of motivation on exercise performance this could have affected the findings particularly at the temperatures tested. Other concerns are the lack of a measure of temperature or core temperature particularly when considering the previous design issues. It is difficult to assert the underlying mechanism in line with the hypothesis without this direct measurement. The authors state that they did not take core temperature and reason clearly as to why not, however could the authors not have reported perceived temperature/exertion in order to give some validity to their findings.

Major compulsory revisions:

Overall: Could the authors detail the degree of impairment/disability of participants using standardised scales. The limitations placed on the findings due to the lack of placebo control, measure of temperature or perceived heat should be more clearly discussed and clarified.

Method:Testing: Was the tester blinded to the training conditions? This needs stating and if the tester was not blind this needs discussing as a limitation in the discussion - see later. Peak exercise test data is in particular influenced by the tester and how hard they push individuals - and as such is vulnerable to effects of both the confidence of the individual being tested to work into discomfort and of the tester's confidence to push the individual. It appears that the tester was aware of the condition which could have affected performance, can the authors clarify.

Discussion:

The discussion could be shorter, more focused and better structured.

Could the first pp state the main findings of this study?

Could the limitations of the design then be stated in pp 2?

The lack of a measure of core temperature in relation to the design used in this study is discussed as a weakness. However a further weakness would appear to be that the tester was aware when the individuals were being cooled. Can the authors discuss this limitation particularly when considering the heart rate data that shows an unexpected response that is not in line with the cooling theory.

PP 3 could be more focused.

Minor essential revisions:

Table 1. would benefit from time since diagnosis and the use of a standardised impairment scale in order for readers to better understand the degree of ability of participants.

Methods

Inclusion/exclusion criteria need explicitly stating.

Analysis: The section would benefit from more explicit description of how the regression analysis was performed on the exercise duration v exercise duration data. How was the exponential curve determined what curve fits were examined what was the criteria. Did the data meet the requirements for this analysis, ie residual analysis etc .

Discretionary comments

Abstract

This describes the study adequately.

Introduction.

This introduces the study clearly and concisely with a clear hypothesis.

Methods

How was the randomisation managed?

Can the authors explain why they chose 23degrees . The device was operating from 18-220, it would not appear to be a great gradient. Can the authors explain their reasoning?

Results

Can mean and SD for HR be reported under both conditions at test termination. Can temperature data and impairment data be added if possible see below.

Figures

There are 2 Figures. Both are appropriate and are clearly labelled with clear headings and legends.

Tables

There are 2 tables

Table 1. would benefit from time since diagnosis and the use of a standardised

impairment scale in order for readers to better understand the degree of ability of participants.

Table 2. # undefined

Discussion

PP5 discusses the effect of increased peripheral resistance lowering heart rate. Could the authors back this statement up with their data it would be surprising if cooling in one hand by 1 degree were to affect blood pressure etc, can this be referenced and clarified.

Could the authors discuss why the temperature was held at 23degrees in relation to optimising the design for this test.

References

There are 33, the most recent reference is 2006.

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What next?: Accept after minor essential revisions

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Acceptable

Statistical review: No, the manuscript does not need to be seen by a statistician.