Reviewer's report

Title: Water displacement leg volumetry in clinical studies - A discussion of error sources

Version: 2 Date: 7 July 2009

Reviewer: Nicholas Henschke

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The authors are to be commended on this well written review of potential error sources when using water displacement leg volumetry. Despite the readability of this review, I have a number of concerns regarding the methodology and the conclusions drawn from the reviewed studies.

Major Compulsory Revisions

1. A clearly stated aim for the study is needed. While the introduction to the use of water displacement volumetry is adequate, on page 4 the authors report: "The starting point for the paper was the experience that a drug for CVI had proven efficacy in one study using water displacement leg volumetry and that this effect was hard to reproduce in further similar studies." I do not feel that this provides an adequate rationale for performing this review and is not consistent with the title of the article. It seems as though the review is aimed at error sources when using water displacement to evaluate the efficacy of CVI drugs, rather than error sources in general.

2. The methods section is concise, but this makes it difficult to ascertain how the selection of studies was performed. There is no clear definition of inclusion or exclusion criteria for the studies. While the results section reports that 31 studies were used to arrive at the conclusions on error sources, no information regarding the type of studies is provided. This relates back to the first point, the need for a clearly stated aim, and is essential for an understanding of how the studies were aggregated to arrive at the conclusions.

3. The results section on type of volumeter (page 6) includes a final paragraph reporting on the precision and reliability of volumetric measurements. As this review is not systematic in its methodology, it is unreasonable to accept that a clear conclusion on these issues can be made from the selected studies.

4. The "Effect size" section (page 6) is difficult to interpret. It does not seem as though the authors were attempting to meta-analyse the efficacy data of the studies in table 1 (based on the methods reported). Therefore, it is hard to know what information to take from this section. The paragraph on page 7 regarding the volumeter height would perhaps be better placed in the "Method" section of the results and needs a number of references from previous literature to support the statements.
5. The conclusions would be expected to clearly promote a carefully standardised measurement approach when using water displacement volumetry. However, they are unclear as to what the main issues regarding these measurements are and do not adequately reflect all of the issues raised in the review. This should be revised.

**Level of interest:** An article of limited interest

**Quality of written English:** Acceptable

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

**Declaration of competing interests:**

I declare that I have no competing interests