Reviewer's report

Title: Factors affecting aseptic loosening of 4750 total hip arthroplasties: multivariate survival analysis.

Version: 1  Date: 5 February 2007

Reviewer: Andrew Roddam

Reviewer's report:

General

This manuscript describes the analysis of factors which could influence aseptic loosening of hip arthroplasties. To do this the authors make use of a consecutive series of arthroplasties between 1995 and 2000. This review concentrates mainly on the statistical and interpretational aspects of the manuscript – overall I think there are a number of problems which need to be addressed in a revised manuscript.

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Major Compulsory Revisions (that the author must respond to before a decision on publication can be reached)

1. I found the rather long and detailed description of the types of joint used and manufacturer presented in the text unnecessary and could be much more adequately summarised in a table.

2. There is a lack of a basic table summarising the main characteristics of the population – for example, sex, type of hip replacement, main reason, etc. To this end Tables 1 through 3 could be combined into a single table, which could be split according to those whose cup failed and those whose stem failed and those which did not.

3. It is currently unclear whether or not there are any patients who suffered both a cup and stem failure. If so these should be treated separately from those who suffered either a stem or a cup failure. Is it true, as it is not stated, that if a patient suffered a cup failure their follow-up time would be censored at the date of this failure when analysing stem failures. This information needs to be given.

4. I find both the description and presentation of the results of the multivariable analysis almost impenetrable. It is not clear what the authors have done and this needs to be resolved. The authors need to state quite clearly what variables were included in the model – and c/f 2 describe these for all participants. Were these variables included all at once or was any sort of stepwise procedure used? My personal recommendation would be to include each variable individually and show these as unadjusted results, then I would include a fully adjusted analysis including all variables. These two analyses can be shown in two columns and all relative risk estimates should be shown – not just those which are not significant. When presenting results for categorical variables it is more usual for the first line to represent the reference group (and hence have a relative risk of 1.0) and then subsequent lines reflect each other level and shows their relative risk and CI. Also for categorical variables I would shown an n for each level to show the numbers contributing.

5. I was very surprised that the authors focused their interpretation so much on the cost aspects since it is not the price that influences the failure of item. Surely it is the more basic differences between the types of cup and stems which leads to failure?

6. This therefore leads to my next question – is it appropriate to include all cup/stem types in an analysis? Should one be looking at failure within say cemented and non-cemented designs? Maybe there are more appropriate subgroups? One should investigate whether the patient/surgeon characteristics are the same in each of these subgroups – competing risks would be an appropriate analysis here.

After addressing the above points, the authors should review their text/interpretation of the results.

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Minor Essential Revisions (such as missing labels on figures, or the wrong use of a term, which the author can be trusted to correct)
Discretionary Revisions (which the author can choose to ignore)

**What next?:** Unable to decide on acceptance or rejection until the authors have responded to the major compulsory revisions

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

**Quality of written English:** Needs some language corrections before being published

**Statistical review:** Yes, and I have assessed the statistics in my report.

**Declaration of competing interests:**

I declare that I have no competing interests