Reviewer’s report

Title: Respiratory physiotherapy and incidence of atelectasis in off-pump coronary artery bypass graft surgery: an observational follow-up study.

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Reviewer: Heather M Arthur

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Respiratory physiotherapy and incidence of atelectasis in off-pump coronary artery by-pass graft surgery: on observational follow-up study

Reviewer’s Comments- Major Compulsory Revisions

1. Is the question posed by the authors well defined?

The authors have been very clear that their focus is related to examining the benefit of pre-operative respiratory physical therapy on the outcome of atelectasis following coronary artery by-pass graft surgery (CABG). This is an important clinical question and if the intervention is shown to be effective, there are several implications for both patients and health service utilization. The argument that this intervention needs to be studied in patients whose CABG is performed off pump is not well articulated. The authors state that although the intervention has been examined in CABG surgery that is carried out ‘on by-pass’, they do not explain in detail what makes them think that the off-pump CABG patients are different in some important way. In particular, what differences would be expected, in relation to the outcome of interest, for patients who have off-pump CABG surgery? Are these patients at greater or lesser risk of post-operative atelectasis?

2. Are the methods appropriate and well described?

There are weaknesses in the methods. First, the observational design is not the most appropriate design to test a treatment/intervention. A randomized, controlled trial design would have been a better approach. The manner in which patients were assigned to receive the intervention or not was related to convenience (admitted to cardiac surgery unit versus other unit). There were unequal numbers in each group (60.5% in treatment group; 39.5% in comparison group). There is no mention of whether a sample size calculation was done a priori and the issue of statistical power is not addressed. The description of the intervention itself is clear and the teaching done by the physiotherapist is well described. However, there is no clear sense of the ‘dose’ of the intervention, how standardization was achieved and, most importantly, no assessment of patient compliance with the exercise recommendations.

3. Are the data sound?
The data analysis procedures are appropriate and clearly stated. The outcome variable was assessed by chest X-ray at 4 time points: before surgery, immediately following surgery in the ICU, 48 hours post-operatively and at discharge from hospital. It is not clear which time point was used as the outcome assessment date. It appears that atelectasis reported at any one of these measurement points was counted as an ‘event’. I would have liked to see a table showing when atelectasis was reported (at each time point) and the two groups of patients. There are problems with some of the tables in that it is obvious that some patients had more than one outcome: atelectasis, pleural effusion, diaphragm elevation etc. It would have been helpful to identify this in the paper and also to discuss its meaning for both the analysis and the results. I am a bit confused by Table 5 since this is not the format in which I am used to seeing the results of a logistic regression.

4. Does the manuscript adhere to the relevant standards for reporting and data deposition?

The authors have presented their data in a transparent fashion.

5. Are the discussion and conclusions well balanced and adequately supported by the data?

The discussion states that the incidence of post-operative atelectasis found in this study was similar to that of other authors. However, as mentioned, it would be very helpful to know exactly what post-operative time point the atelectasis was most frequently found. This could influence the discussion of the paper in terms of possible recommendations about the pre-operative intervention. Since patient compliance to the instructions for pre-operative respiratory exercises was not reported we cannot be certain about what the magnitude of the effect is or, in particular, the dose response. The findings are quite interesting and suggest that there is merit in pre-operative respiratory physiotherapy but I would be much more confident in the findings if a more rigorous design had been used. I disagree with the authors that it would have been unethical to conduct a RCT.

6. Are limitations of the work clearly stated?

One limitation is presented and it is the issue of the study design. I think other limitations could have been acknowledged.

7. Do the authors clearly acknowledge any work upon which they are building, both published and unpublished?

Yes, this is clear.

8. Do the title and abstract accurately convey what has been found?

Yes.

9. Is the writing acceptable?
There are errors in English grammar and spelling.

**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.