Reviewer’s report

Title: Mediating effects of shoulder-arm exercise on the postoperative severity of symptoms and quality of life of women with breast cancer

Version: 0 Date: 22 Mar 2020

Reviewer: Joseph Abi Jaoude

Reviewer's report:

The authors present a cross-sectional study analyzing the QOL of patients with breast cancer after surgery. The study compares the QOL of patients that followed shoulder exercises, and those that did not. The authors present an interesting article for many reasons. First of all, the authors tackle the subject of physical exercise, which the general public (including physicians) tend to consider useful and beneficial, while limited data on the topic exist in great cancer. Second, and most importantly, the authors present a study on QOL, which should be constantly encouraged nowadays, as QOL is one of the only 2 (along with OS) clinically relevant endpoints to the patients. As such, this paper, despite its many flaws, would be very interesting to the readers of BMC Women's Health.

Comments:

Introduction: plz shorten the intro as it is too lengthy, and the general idea of adverse events is redundant, a few sentences on common adverse events and decreased QOL would suffice.

Methods: This is a cross-sectional study, so it would obviously carry a lot of limitations and bias, hopefully in the future prospective studies would be implemented. This is something that the authors should mention more clearly in their limitations, instead of only calling for new prospective study. It should be made clear that the study design is a limitation to the study. Also the conclusion should call for prospective QOL studies, as a primary endpoint.

Methods: any reason why the authors picked a 90% power? This is weird as the typical number used is 80%, maybe add a sentence on the reason for the 90% if anything relevant.

Methods: What are the 10 predictors that you assumed initially in your design?

Methods: FLIC, please change "person's" to "patient's QOL"

Methods: is the FLIC validated in Breast cancer? Whether yes or no, it should be mentioned in text. And if not, should be added to the limitations too. It is okay to use non-validated tools since HRQOL are still relatively new, and thus any research on that filed should be encouraged. But if the tool is not validated it should be made clear.

Methods: same question for SDS-CMF.

Discussion: It would be interesting if the authors could add few points on how QOL are being implemented. QOL are - in the majority of trials - included as secondary endpoints only. While in reality, OS and QOL are the only 2 clinically relevant patients endpoints. As such,
one or those 2 endpoints should always be a primary endpoint in any clinical trial. More importantly, any trial that is practice changing should be based on one of those 2 endpoints, and not surrogate endpoints, like the most commonly used PFS. The authors could add those points mainly focusing on QOL, and add some citations.

Limitation: a major limitation to be added is the lack of comparator and baseline in the study, which severely limits the interpretation of QOLs. Simply comparing QOL numbers at one time point between two groups (shoulder exercise vs No exercise) is definitely not enough to draw conclusions. The validity of QOL measurement tools is quite complex, and depends on many factors, including multiple time points, and MID, issues that are not tackled at all by the authors.

Conclusion: the conclusion and take-home message should be toned down. This study is nice, however, the study suffers from extensive limitations, and thus any conclusion is questionable. Using "could" and "may"… would be better in the conclusion, as a clear indication cannot be induced from this study. It is fine to have questionable outcomes, however this should be made clear, rather than stating strong conclusions, that readers might simply take for granted. This comment also applies to the conclusion in the abstract.

Conclusion: The call for future research should focus mainly on prospective, multiple-time points and follow-ups QOL studies, mediators like KPS would be less interesting, as the complete purpose of QOL, is to be a stand alone endpoint. Another really interesting call, would be to include more studies (mainly clinical trials) where QOL is a PRIMARY endpoint, and not just a secondary endpoint.

Tables: Could the authors specify individual T, and N stages (no need for M, as no metastatic patients were recruited) instead of clumping them together into the composite stage? Adding tumor size (T), lymph node involvement (N) alone would be a better way to understand the population. Especially N stage, as N stage play a big role on management, and subsequent adverse events.

**Are the methods appropriate and well described?**
If not, please specify what is required in your comments to the authors.

Yes

**Does the work include the necessary controls?**
If not, please specify which controls are required in your comments to the authors.

Unable to assess

**Are the conclusions drawn adequately supported by the data shown?**
If not, please explain in your comments to the authors.

No
Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?

If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

I am able to assess the statistics

Quality of written English

Please indicate the quality of language in the manuscript:

Needs some language corrections before being published

Declaration of competing interests

Please complete a declaration of competing interests, considering the following questions:

1. Have you in the past five years received reimbursements, fees, funding, or salary from an organisation that may in any way gain or lose financially from the publication of this manuscript, either now or in the future?

2. Do you hold any stocks or shares in an organisation that may in any way gain or lose financially from the publication of this manuscript, either now or in the future?

3. Do you hold or are you currently applying for any patents relating to the content of the manuscript?

4. Have you received reimbursements, fees, funding, or salary from an organization that holds or has applied for patents relating to the content of the manuscript?

5. Do you have any other financial competing interests?

6. Do you have any non-financial competing interests in relation to this paper?

If you can answer no to all of the above, write 'I declare that I have no competing interests' below. If your reply is yes to any, please give details below.

No conflicts of interest to declare

I agree to the open peer review policy of the journal. I understand that my name will be included on my report to the authors and, if the manuscript is accepted for publication, my named report including any attachments I upload will be posted on the website along with the authors’ responses. I agree for my report to be made available under an Open Access Creative Commons CC-BY license (http://creativecommons.org/licenses/by/4.0/). I understand that any comments which I do not wish to be included in my named report can be included as confidential comments to the editors, which will not be published.

I agree to the open peer review policy of the journal