Reviewer's report

Title: Obesity and breast cancer outcomes in chemotherapy patients in New Zealand – a population-based cohort study

Version: 0 Date: 28 Aug 2017

Reviewer: Elisabetta Rapiti

Reviewer's report:

This is an interesting article investigating different outcomes in a population of New Zealand breast cancer patients according to BMI, focusing in particular on the effect of obesity among women who were treated with chemotherapy.

Contrarily to the great majority of published literature on this topic, the results of the study show no association between obesity and breast cancer mortality, overall mortality, recurrences or metastases.

The main problem is relative to the categorization of the BMI and the choice of the reference category. The authors categorize BMI in 5 categories with the first category including patients with BMI <21 and the reference category being the patients with BMI 21-24. According to the WHO international classification of BMI the so-called "normal" or "lean" category is "18.50-24.99", and is the category chosen as reference from most studies, while patients <18.50 are considered underweight. The choice of the authors to include in the first category a number of patients with "normal" BMI is likely due to the very low number of true underweight patients in the study sample (<18.5 n=8). Given that the focus of the paper is on obesity patients, I think the authors should not include these 8 women in the analysis and should compare the other categories to the category of patients with 18.5-24.99 including also the remaining 73 patients of normal weight.

Detailed comments.
Methods:

The authors should give more details on the Waikato clinical breast cancer register and on the cancer registry ascertainment of vital status and cause of death. In particular they should indicate if there were patients lost to follow-up.
For the estrogen and progesterone receptor status it would be useful to know at which level they were considered positive.

The authors state they adjusted the Cox models for "all the baseline characteristics except Her-2". Could they be more explicit and list the variables included in the models (is primary treatment also included and if yes how?).

Why did they choose to include all the variables? Only few variables differ according to BMI. Are all the baseline characteristics associated to the outcomes? The choice to include in the model all the variables may result in an overadjustement and problems of collinearity between (ex. age and menopausal status).

Results:

The percentages of obese women in the text, second paragraph, are 69%, 55% and 30% while in Table 1 they are 69%, 57% and 33%.

In the nextpage in line 7 you say "Obesity was marked more common in patients treated in the private health care sector than in the public sector." While in table 1 is shown the opposite.

In table 1 the column of "% obese" seems not correct for most of the variables.

Also the percentages in the rows "Total breast conserving surgery", "Total mastectomy", "Total with RT" and "Total without RT" are not correct.

In Table 2 and 3 the authors should add a footnote to specify the variables included in the adjusted models.
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.

Yes

Are the conclusions drawn adequately supported by the data shown?
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Yes

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