Reviewer's report

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

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Reviewer: Sarah Nechuta

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BMC Cancer Review

Obesity has been extensively studied in association with breast cancer recurrence and survival. However, gaps in knowledge remain including understanding changes in adiposity over time, mechanisms underlying the role of obesity in breast cancer outcomes and metastasis, and the associations in understudied racial/ethnic groups. This study addresses one of these limitations as stated by the authors as "the first assessment of obesity and breast cancer outcomes...New Zealand patients treated with chemotherapy". Overall, the study methodology is sound. The findings are that obesity is not associated with breast cancer recurrence or survival outcomes in this population. It is important the authors make clear that this is based on one measure of BMI and the timing of measurement in relation to diagnosis. Further, as findings are null, inclusion of a formal evaluation of statistical power based on number of events for at least one of the primary outcomes is needed. Finally, some limitations in the methods and scientific writing need to be addressed as detailed below.

Abstract,

1. In Background, last paragraph, replace "series" with cohort

2. Methods section is unclear. "followed for life?" replace with last follow-up data and provide median follow-up time for the cohort.

3. It is unclear that the primary analysis was conducted among 1049 women (and the rational for this) based on how the methods section in the abstract is written.

4. Provide timing of BMI assessment in relation to diagnosis, specifically mean and range.
5. Results, need a "and" in between "type of surgery" and "receptor status" when describing the subgroup analyses

6. Conclusion, include the timing of BMI to help with interpretation, such as obesity at time of treatment initiation or at least postdiagnosis.

Background

1. The last sentence of the first paragraph of the introduction is unclear. Chemotherapy patients are mentioned, but then the reduced response is described in relation to aromatase inhibitors, which are not a type of chemotherapy.

3. Replace "series" with cohort to be more clear in the first sentence of the second paragraph

4. "So had virtually complete data on BMI"….why does restricting to women who received chemotherapy result in complete data on BMI, this is unclear.

Methods

1. First sentence of the methods resident should be "residents"

2. Information on some of the data used in the analysis is missing. All variables mentioned in Table 1 should be described in the methods with the data source. Specifically, information on measurement is lacking for menopausal status, facility, cancer treatment (chemotherapy, hormonal therapy, radiotherapy, surgery), and outcomes including recurrence, metastasis, and mortality. Is any information available on the validity of recurrence/metastasis outcomes? In addition, information is needed on how data were collected on anthropometric measurements and on timing of measures in relation to diagnosis of breast cancer.

3. Was the proportional hazards assumption evaluated?
Results

1. The first paragraph has missing parentheses and could use some editing.

2. In page two of the results, the sentence "Despite this, the proportion of obese patients tended to increase with more advanced stage...." is repetitive with the sentence below this that states "Obesity tended to be greater in women with advanced disease..").

3. In the paragraph under the heading "Outcomes in relation to BMI…” The whole follow-up period is described as "12 years" but earlier in the abstract 14 years is mentioned.

Tables

1. BMI units need to be mentioned at least in the title of each table. For example, Table 1 has no units.

2. Table 2 and 3 both need footnotes describing adjustment factors.

3. Table 2, add the word therapy after "hormonal" in the title

4. Table 3, provide a footnote providing the n in each subgroup (a and b), that is excluded from the table.

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

No

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?
If not, please explain in your comments to the authors.

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

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