Reviewer's report

Title: Comparative performances of prognostic indexes for breast cancer patients presenting with brain metastases

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Reviewer: Anna Niwinska

Reviewer's report:

1. The authors try to solve a very important problem concerning proper selection of breast cancer patients with newly diagnosed brain metastases in order to prescript the most adequate method of treatment. The topic is timely and the choice of the best prognostic index which would be useful in clinical practice is being awaited by the community of oncologists treating breast cancer patients.

2. The methods of the study are appropriate and well described.

3. It seems that the data is sound, however the retrospective nature of the study requires confirmation of the results in future studies, performed in prospective way.

4. The manuscript adheres to the relevant standards for reporting and data deposition.

5. Conclusions are well balanced and adequately supported by the data, however the discussion requires supplementation.

6. The limitations of this work:
   6.1. In some patients brain metastases were detected in computed tomography (CT) in other- in magnetic resonance (MR). CT is not appropriate method for detection of single-several (1-3) brain metastases. This exact information is required for proper distribution of patients in two prognostic indexes: GPA and Breast-RPA. Misinterpretation of the number of brain metastases in CT could misclassify patients and falsify the results of the study. In how many patients brain metastases were detected by CT?
   6.2. In retrospective analysis, it is very difficult to assess distant metastases as controlled (solitary bone metastasis long after radiotherapy or lung metastasis after metastazectomy) versus uncontrolled (liver/ lung metastases during systemic treatment). This information is required in breast RPA prognostic index and retrospective analysis of the study can misclassify patients to prognostic classes. Similarly, it is very difficult to assess retrospectively performance status: differences between KPS 100 and 90 or 70 and 60 are retrospectively impossible to assess. Such mistakes can misclassify patients and make final results doubtful.

Please, add these two remarks to the discussion in the part concerning limitations of the study.

7. The title and abstract accurately convey what has been found.
8. The article is written well

• Discretionary Revisions: Page 10. Discussion. I do not understand the sentence concerning the study number [14]. Why irradiation of 98% of patients is a selection bias of this study? It seems that identical treatment of almost all patients is rather strength of the study and not its limitation. Can you explain your point of view?

• Minor Essential Revisions: In Table 1: Breast RPA Class 3: it is KPS#60; it should be: KPS=<60.

Despite these suggestions and questions, the manuscript concerns important problem, useful in everyday clinical practice. It is written well and worth publication after minor correction.

**Level of interest:** An article of importance in its field

**Quality of written English:** Acceptable

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

I declare that I have no competing interests