Author's response to reviews

Title: Evaluation of breast cancers with diffusion-weighted MRI: comparison among different b values

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Author's response to reviews: see over
Dear Prof. Vordermark,

Thank you very much for your letter and advice. We have revised the manuscript in accordance with the reviewers’ comments, and carefully proof-read the manuscript to minimize typographical, grammatical, and bibliographical errors. The amendments are highlighted in red in the revised manuscript. Point by point responses to the reviewers’ comments are listed below this letter.

We hope that the revised version of the manuscript is now acceptable for publication in your journal.

I look forward to hearing from you soon.

With best wishes,

Yours sincerely,

Xi-Jing He
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We would like to express our sincere thanks to Prof. O’Flynn for the constructive and positive comments.

Replies to Reviewer

Major Compulsory Revisions

1. Abstract:
Comments “b values used with varied sensitivity and specificity “…needs expanding on in text.
Answer: The comments have been added in the Background (P2, L11) in the revised version.

2. Title:
States “Evaluation of breast cancers…” however the data is for malignant and non-malignant lesions. Suggest “Conspicuity of breast lesions at different b values on diffusion-weighted imaging”
Answer: Amended as suggested.

3. Methods; P1, L8:
“All eligible patients met the following….“ This sentence is confusing and needs Rewriting
Answer: The sentence has been changed in the Methods (P1, L7) in the revised version and we hope that it has been made clearer now.

4. Methods; P2, 17/18:
Do not need details on the full breast MR protocol –remove DCE information. Could say standard anatomical + DCE sequences. Need to give plane of imaging of DWI sequence
Answer: Detail information of standard anatomical and DEC sequences has been removed as suggested. The plane of DWI has been added in the P2, L10 in the revised
5. Methods; P4:
The 5 point confidence scale needs to be explained more clearly – probably more appropriate in a table?
Answer: Amended as suggested and Table 1 has been added in the revised version.

Need to say whether DW and ADC maps were looked at alone or together with the DCE data.
Answer: DW images and ADC maps had been looked at alone in the study and several sentences have been added in the P3, L6-9 in the revised version.

6. Methods; P5, L3:
Text comments on “the hypointensity center of the heterogeneous lesions on ADC maps”. The central part of a large ring-enhancing breast tumour is generally hypointense to the periphery on high b values and conversely hyperintense on the ADC map as it represents central necrosis with increased free diffusion compared to the densely cellular peripheral rim. Clarity is needed here as this is confusing and potentially misleading.
Answer: Actually, we have revised the “center” as “region” in the revised version.

ROI drawn in the anterior “blank” area of breast – specifically is this outside of the breast and a noise measurement?
Answer: The sentence has been revised to make it clearer in the Methods (P5, L9).

ROI 10mm2 is very small – how many pixels have been measured?
Answer: The ROI could measure about 7 pixels. We think that small ROI had been used to avoid contamination by other tissue. As you know, some malignant lesions has slim peripheral rim, it is hard to measure ADC accurately if using larger ROI.
7. Results; needs rewriting:

Need to be presented in a more comprehensive manner for ease of understanding. The text is too discursive at present. The subheadings of “lesion detection”, “SI on DWI” and “ADC performance” are appropriate.

For “Lesion detection may be more comprehensive to state “57 lesions from 52 women were analysed including 18/57 benign (mean size, range) and 39/57 malignant (mean size, range) – see table 1 for pathological subtypes.” The sensitivity and specificity of each method (DCE- and DWI) for detection needs stating.

Tables displaying the visibility of different pathological subtypes at different b values may bring clarity to this section.

Answer: We have revised P1-3 in the results and added Table 3 in the revised version. We hope that we have made it more comprehensive now.

Minor Essential Revisions

Abstract

1. P1, L2, better reads as “Different b values have been used with varied sensitivity and specificity. This study aims to prospectively compare the diagnostic quality of DW imaging at different b values in the evaluation of breast lesions.

Answer: Amended as your suggestion.

2. P2, L4, remove “conventional”……and correct “with maximum b vales of 600, 800 and 100

Answer: Corrections have been made in the revised version.

3. P2, L5, better reads as “Visibility scores of lesions on DW images at different b values were performed”

Answer: Corrections have been made in the revised version.
4. P3, L1, Better reads as “57 lesions from 52 recruited patients including 18/57 (32%) benign and 39/57 (68%) malignant were confirmed with pathology.

Answer: Amended as your suggestion.

5. P3, L3, better reads as “DCE MRI accurately detected 53 lesions and DWI 52 lesions” (include sensitivity and specificity)

Answer: Amended as your suggestion.

6. P3, L4, include actual SNR and CNR values

Answer: SNR and CNR values haven’t been added in the revised version for too many words in the abstract.

7. P3, L7, include values for mean ADC +/- sd

Answer: Amended as your suggestion.

8. P4, L3 better reads as “…DW imaging at 1.5T”

Answer: Correction has been made in the revised version.

Background

1. P1, L2, better reads as “Based on the morphology and enhancement pattern of lesions….”

Answer: Amended as your suggestion.

2. P1, L5, better reads as “Therefore the classification of a breast lesion…..”

Answer: Amended as your suggestion.

3. P1, L6, better reads as “detected with MRI”

Answer: Amended as your suggestion.

4. P2, L7, better reads as “since a lower ADC”
Answer: Amended as your suggestion.

5. P2, L8, better reads as “This occurs because of restricted water movement in high cellularity tumours”
Answer: Amended as your suggestion.

6. P2, L10 better reads as “specificity values vary and range between….. ADC of malignant lesions ranges from….and that of benign lesions from…”
Answer: Amended as your suggestion.

7. P2, L13 better reads as “These distributions have…”
Answer: Amended as your suggestion.

8. P3, L2 better reads as “On clinical MRI scanners…”
Answer: Amended as your suggestion.

9. P3, L11 better reads as “1.5T”
Answer: Amended as your suggestion.

10. P3, L13 better reads as “background signal of the glandular parenchyma…”
Answer: Amended as your suggestion.

11. P4, L1 better reads as “Based on these concepts we have carried out a prospective study to evaluate the influence of different b values on lesion conspicuity, the ADC measurement and the performance…”
Answer: Amended as your suggestion.

Methods
1. P1, L2 delete “from our hospital’s department of oncology
Answer: Amended as your suggestion.
2. P1, L3 better reads as “60 patients with a palpable breast mass and clinical indication for breast MRI….”
   
   Answer: Amended as your suggestion.

3. P1, L5 better reads as “DW imaging”
   
   Answer: Amended as your suggestion.

4. P2, L11 better reads as “Three distinct DW sequences using b=0 and b=600, 800 or 1000 s/mm2 were performed.”
   
   Answer: Amended as your suggestion.

5. P2, L13 remove the word technology
   
   Answer: Amended as your suggestion.

6. P2, L17 better reads as “Acquisition time was 1 minute 20 seconds with 20-24 slices.”
   
   Answer: Amended as your suggestion.

7. P3, L3, should specify “Each patient had 3 ADC maps created using two b values, 0 and either 600, 800 or 1000 s/mm2.
   
   Answer: Amended as your suggestion.

8. P3, L7, better reads as “evaluated each ADC map”
   
   Answer: Amended as your suggestion.

9. P3, L8 remove this final sentence
   
   Answer: The final sentence has been removed in the revised version.

10. P4, L1 better reads as “each reviewer graded the conspicuity of lesions on a
5 point confidence scale based on the appearance and signal strength of lesions on the high b value DW image alone” if this was the case

Answer: Amended as your suggestion to make it clearer.

11. P4, L3, Suggest “1= not seen – 5 = well seen

Answer: Amended as your suggestion in the Table 1 in the revised version.

12. P4, L9, Remove the final sentence

Answer: The final sentence has been removed in the revised version.

13. P5, L1, Suggest “Signal intensity was recorded on the high b value on DW imaging and ADC was documented.

Answer: Amended as your suggestion.

14. P5, L5-10 SIa, SIb and SIc may be more easily interpreted as SIl lesion, SInormal and SIbackground

Answer: All of them have been amended in the revised version as your suggestion.

15. P7 L1-4 remove this sentence not needed

Answer: Amended as your suggestion.

16. P8, L2, better reads as “Visibility scores of the lesions on 3 DW series (b=0, 600), (b=0,800), (b=0,1000) were compared…”

Answer: Amended as your suggestion.

17. P8, L9, better reads as “independent samples t-test”

Answer: Amended as your suggestion.

Discussion

1. P1, L8 better reads as “There was a highly significant difference in the visibility
score overall between….” Also should comment here on visibility of lesions at different b values and the significant of it.

Answer: Amended as your suggestion and several sentences have been added in the revised version.

Conclusion
1. Better reads “DW imaging is a potential adjunct to conventional breast MRI in differentiating between benign and malignant lesions. The performance of DW imaging at 1.5T is not significantly influenced by varying the maximum b value from 600 to 1000 s/mm2”….

Answer: Amended as your suggestion.