Reviewer’s report

Title: Comparison of diagnostic methods for early interproximal caries detection with nearinfrared light transillumination: An in vivo study

Version: 1 Date: 10 Jul 2017

Reviewer: Hermann Agis

Reviewer's report:

In their study the authors compared near-infrared light transillumination (NILT) and bitewing radiographs with digital phosphor plates (PSP) for the detection of interproximal lesions in-a clinical setting. Based on their results the authors conclude that NILT reaches the level of sensitivity and accuracy tor reveal early interproximal caries. Although the topic of detection of early interproximal caries is of high clinical relevance there are several issues that need to be solved before the study meets the high standard of BMC Oral Health.

Major issues:

1) Overall the authors did not convincingly show the novelty of their study. Given the fact that the authors discuss some of the available studies which evaluate the feasibility of NILT for interproximal lesions it remains unclear why the authors have not provided this information in the introduction and background. As this literature is available the authors should provide the information in the introduction and clarify the rational of their study.

2) The authors also aim to reveal the interobserver difference. Why were the number of observers limited to two with different training and experience level? What does an average of 8 years of experience for two observers mean? This is very unclear as hypothetically one of the two observers could also have no experience if the other has 16 years.

3) The methodology is not clearly described: I strongly would suggest a flow chart for the study design. Furthermore, inclusion, exclusion, and drop out of patients for the study should be presented in a flow chart similar to the concept of the consort flow chart.

4) The authors should provide a section on the limits of the study and provide a paragraph on future perspectives. It is unclear what the authors mean with "However, it should be
indicated that the of bios cannot be excluded from any in vivo diagnostic study for ethical reasons as in this study."

Minor issues:

1) Abstract: The authors provide only the aim of the study in the background but do not present the rational of the study.

2) The authors should be consistent with the use of terms and abbreviations. E.G. "Observer 1" vs "Obs1", "p values" vs. "level of significance"

3) The authors should double check the manuscript for formatting. Although this is revision 1 (R1) there are still several issues such as color (page 4, line 58) and typos ("…", page 6, line 106, "didnit" page 6, line 111) and more. The authors also used several different formats for numbers e.g. 28.1 vs. 28,1. The authors should use "." instead of "," when reporting numbers in the manuscript and the tables.

4) Page 7, line 121 "The decision for cavity preparation (validation phase) was mainly based on combined clinical and radiographical evaluation." If the authors used mainly these two issues for their decisions, what other criteria were used? Maybe the authors want to rephrase this sentence?

5) The authors should reevaluate their usage of the term "gold standard".

6) Discussion: Page 11, line 226: What do the authors mean with "This may due to experience of the examiners." The authors should provide further information on this issue in the manuscript.

7) Author's contributions: Line 263 "IHB, MEK, and KO designed the study and helped to draft the manuscript." Who did IHB, MEK, and KO help to draft the manuscript? Who were the two observers mentioned in the abstract and method section? Please include this information.
8) The authors should provide the data following the guidelines of the BMC Oral Health journal.

9) Table 1: What is SE. The authors should define the abbreviations also in the table legends.

10) I suggest that the authors should consult a scientific trained native speaker for help with the manuscript.

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

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 recommend additional statistical review

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Not suitable for publication unless extensively edited
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