Reviewer's report

Title: Initial periodontal screening and radiographic findings - A comparison of two methods to evaluate the periodontal situation

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Reviewer: Keith Horner

Reviewer's report:

This is an interesting paper, comparing two diagnostic methods for the diagnosis of "periodontitis". Comparing the performance of diagnostic methods is always difficult in vivo, as a reference standard (truth) is often impossible to achieve. The manuscript is generally well written and presented. I have, however, some comments on certain aspects, and some concerns about the study design.

In conclusion, I feel that there are weaknesses in methodology and a rather narrow interpretation of results. I agree with your conclusion in the abstract, but not that in the Discussion. Your study simply emphasises that the value of radiography in initial periodontal examination is not established.

Minor essential revisions:

1. The status of the DPT is raised above that which it either deserves or actually exists. I'm not sure what the situation is in Germany, but about half of dentists in the UK (for example) would not have, or not refer patients for, panoramic radiography. Thus the first statement in the abstract that "....dental panoramic tomography are elements of the initial dental examination" is not true for many dentists. Research evidence shows that screening with panoramic radiography is unproductive, with a majority of patients receiving no diagnostic benefit or treatment impact (see papers by Rushton VE et al.) Similarly at the end of the second paragraph of the Background section, you state: “In cases with apparent bone loss, however, it [DPT] is essential for the diagnosis, characterization and monitoring of advanced periodontitis”. You cite papers in support of this statement, but I could cite others that might not. On page 6 (Discussion) you say that on DPTs initial bone loss is not detected or identified, but then state that “X-rays in combination with clinical records are essential”. Isn’t this illogical?

Panoramic radiography is used by some clinicians to assess advanced/severe periodontal bone loss, but to say it is essential is not true. I think that you should adjust your words to reflect the lack of agreement on the role of radiography in assessment of periodontal bone loss.

2. A radiograph cannot diagnose “periodontitis” or periodontal disease. All a radiograph can do is demonstrate (imperfectly) the consequences of periodontal disease (bone loss) and factors associated with it (calculus, restoration defects, etc). A radiograph will not provide information about disease activity. I think that this is a point worth making somewhere.
3. Inclusion criteria: I think that a possible 12 month gap between radiography and clinical examination is a problem here. It is possible, but probably unlikely, that the radiographic features might change over a 12 month period. So you may not be comparing the same patient condition. Furthermore, the clinical assessment measures pocketing. If the periodontal health had improved between X-ray and clinical examination, perhaps the pocket depths could have improved, or become less “probeable “. The point I am making is that this is a real weakness in the study design. At the very least you must discuss these possible problems in the discussion.

4. Methods; radiographic examination section: How did you assess agreement on assessment criteria? You give a kappa value of >0.8. How did you get this? It was not clear to me whether the two observers worked independently or by dual (consensus) reading of images. Please explain in more detail.

5. I worry about the small percentage of subjects in the study that had no disease. It could be argued that this would predispose observers (clinical or radiographic) to “expect” a positive finding and increase the proportion of positive results. Please discuss this.

6. Methods; radiographic examination section: The term “limbus alveolaris” is not known to me. I assume it is the same thing as the alveolar crest. Can you use a more internationally recognised term?

7. Methods; radiographic examination section: “physiological structures” is not the correct term. I would use “normal anatomy”.

8. Methods; statistical evaluation: Please tell us which statistical programme you used (p.4).

9. Discussion. You cite Walsh et al [23]. Don’t you find it strange that these authors recommended DPT for “periodontal diagnosis” when their results seem to show that there was an over-estimation of bone loss? It would be worth discussing this.

I found your statement “This result supports the finding that progressive bone loss can be reliably diagnosed using DPT” inexplicable. As far as I can see, your results (Table 1) suggest that DPT underestimated disease compared with clinical examination. My conclusion from this might be that there is no value in DPT in cases of initial screening for periodontal problems. Of course, an alternative hypothesis might be that clinical screening examinations overestimate disease and the DPT was actually more accurate. We just do not know. Please consider this in the discussion.

Level of interest: An article whose findings are important to those with closely related research interests

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.