Reviewer's report

Title: Comparison of photographic and visual assessment of occlusal caries with a histological gold standard

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Reviewer: Fausto Mendes

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Major compulsory Revisions:

This study aimed to compare diagnostic performance for the detection of caries into dentine of intra-oral photographs with a visual examination method developed and described by the British Association for the study of Community Dentistry (BASCD) and histological section as the gold standard. The topic is interesting; however, my major concern is about the suggestion in using photographic method in epidemiological surveys. Despite the advantages mentioned by the authors, I strongly believe that this procedure is not feasible in large epidemiological surveys. Taking clinical photographic images is much more difficult than to take them in extracted teeth, mainly at the posterior region. Furthermore, the superiority of photographic method was numerical, but I guess this difference is not statistically significant. Therefore, I think the photographic method could be used to acquire some examples of clinical situations, but not for epidemiological purposes. Maybe, at the clinical setting, the method could be used to allow remote dental examination. Thus, I think the authors should rethink the rationale and discussion of the study.

Minor essential revisions:

Title: The authors should delete the mention to the histological gold standard.

Some suggestions:

“Use of photographic method in detecting occlusal caries lesions” or

“Comparison of photographic and visual assessment in detecting occlusal caries”

Abstract:

- Add in abstract the method used (BASCD)
- Describe that agreement assessments between the examiners (inter and intra) were performed and the weight kappa values were calculated. (In Methods).
- Report the main results related with the examiners reliability.
- In the conclusion, the authors report that worth exploring further the use of intra-oral photographs in epidemiological studies, however, this is in discordance with the objective of study. I suggest removing that phrase.
Aims:
The authors should delete our hypotheses. They are implicit in the aim of the study.

Methods:
- Describe with more details how the examiners was trained and calibrated. Children and extracted teeth were for the training and calibration process? How long it was?
- The authors describe that the second visual exam was performed 1 hour after the first. Why 1 hour? Generally, the second exam is performed at least one week after the first to examiners for that the memory of the examiners does not influence the results.
- The two evaluations of photographs were held in different conditions. For that the intra-examiners reliability was performed the two evaluations should be taken in the same conditions. If the photographs are evaluated in different conditions, the disagreements found could be due these different conditions. An alternative is, firstly, to evaluate the photographs in two different conditions, and, after one week, re-evaluate the same photographs in the two same conditions. So, the authors could show in which condition the assessments are more reliability.
- The authors could be performed an analysis considering the specificity and sensitivity of the visual and photographs methods when the two methods are used together.
- A statistical comparison between the methods by examiner should be performed.

Results:
- What the ranged kappa values for inter-examiner?

Discussion and conclusion:
- The authors asserted that the possibility of one examiner perform all examinations using the photographic images is a good point to reduce variability. However, this variability would increase because of technical differences in obtaining of photographic images. Probably, this technical difficult would increase the variability and decrease the validity. The authors should discuss about this possibility.
- In Conclusion, the authors report that worth exploring further the use of intra-oral photographs in epidemiological studies, however this needs to be further discussed. Generally, in epidemiological surveys data collection involves many variables, not only the presence or absence of the dentine caries lesions in occlusal surface. For example, actually the studies are considering in their surveys the activity assessment and the presence or not of mature plaque. Moreover, as cited in the introduction, index that considered all lesions stages, as the ICDAS, have been used, and for this purpose, the use of camera is inappropriate
- Moreover, a large number of examiners are involved in epidemiological
surveys; therefore, many cameras would be needed. The use of this method will make the survey more expensive. Since the photographic method presented a similar performance than the visual method, and the visual is easy, cheap and consolidated in the literature, the visual method should be the first option.

- Furthermore, to assess the prevalence of caries in a population, all teeth should be evaluated. This involves the examination of the upper and lower teeth. Therefore, to get good pictures of the teeth, the use of mirrors is recommended, what makes more difficult the use of such method in epidemiological surveys. Therefore, considering that data collection should be simplified in epidemiological surveys, I believed that the use of photographs cameras is not the best option. Maybe, this method can be considered in studies that do not involve a lot of people and that an appropriate time can be spent on each exam, what is not possible in epidemiological surveys.

**Level of interest:** An article of limited interest

**Quality of written English:** Acceptable

**Statistical review:** Yes, and I have assessed the statistics in my report.

**Declaration of competing interests:**

The reviewer do not have any conflict of interests in relation to the paper that I reviewed.