Reviewer's report

Title: Periodontal infection as a model for studying infectious etiologies of cardiovascular disease: evaluating clinical periodontal measures as surrogates for bacterial exposure. The Oral Infections and Vascular Disease Epidemiology Study (INVEST).

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Reviewer: Pekka Viljo Ylöstalo

Reviewer's report:

The topic of this article is interesting and important. Because large epidemiological studies do not have microbiological measurements there is a need for evidence of which clinical measurement best reflects periodontal infection. This article is well written and I have only few comments and suggestions:

Minor Essential Revisions:
- The title could be rephrased better to correspond the content of the article. There are only few references to CVD, (abstract 0, discussion 1). Moreover, authors themselves justify the selected bacteria (EB, etiological burden) because these bacteria are possible causative bacteria to periodontitis. Authors also repeat this in the beginning of the discussion section. The fact that these bacteria also associate with CVD (along with other bacteria) is not a justification for this study. The article would be clearer and more readably if authors focus the relation between etiological burden (EB) and clinical measures of periodontal infection. Also, there are contradiction between the aim of the study and ‘We defined …’ sentence (in the intro).
- Percentual and absolute measures seem to be modified by the number of teeth. Authors could emphasize that relative measures of periodontal reflect better periodontal infection than absolute measures
- Authors could discuss on the nature of these different measures. The main problem with AL and BOP is that they no not specifically refer to the destruction of soft tissue. For example, that BOP is mainly the measure of infection of gingiva, which is one sign of periodontal infection. Due to that fact, it is not unsurprising that correlation with periodontal infection is high. It could also be mentioned that AL can be due to trauma, often related thin phenotype of gingiva. It can also be a sequela of treated periodontal infection
- It is also worth pointing out that these associations between EB and different measures may vary between populations. This variation may depend on treatment of the periodontitis, age of the population and the commonness of smoking habit, for instance
- page 3. ‘for this hypothesis’ Authors could be more specific. Specify ‘this hypothesis’. Is the sentence where authors refer their own study really needed?
- Table 1: % and # should be explained
- Table 3. Standard order of abbreviations could be used

Discretionary Revisions
- page 4 ‘relationship’: the direction of the association could be said
- page 5 ‘see below’ this reference in unclear
- page 3 the term ‘cross-sectional association’. Rephrase
- page 5, first paragraph. Reference could be provided, as it is provided in page 6
- Results: If the properties of the study are provided as results, a subheading could be used. Alternatively, information about the study population should be provided in the methods section.
- In Result section, page 9: ‘Pair-wise comparisons…’. Since p-value is a confounded measure, I suggest that authors do not emphasize the results based on p-values. Is this sentence really needed?
- Information on the distributions could be presented in the form of figures
- ‘Conclusion’ could be changed to ‘Conclusion and Implications’, because the conclusion starts with an implication
- Authors could also mention as a limitation that no combinations of different clinical measurements were studied

**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.