Reviewer's report

**Title:** Change of periodontal inflammatory indicators through a 4-week weight control intervention including caloric restriction and exercise training in young Koreans: A pilot study

**Version:** 6  
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**Reviewer:** Robert Fell

**Reviewer's report:**

The authors have submitted the manuscript with the aim of investigating whether a four week weight loss program including exercise and dietary modification can result in changes in periodontal inflammatory markers. The methodology used 41 obese subjects who participated in a supervised exercise program and dietary restriction. Changes in Anthropometric measurements as well as serum and gingival crevicular fluid markers were compared on day one and day 27.

In all sections of the manuscript there are major issues that the authors need to address and a thorough proof read by an English-speaking clinician/periodontist may help to reduce the numerous examples of poor grammar and incorrect dental terminology. The following suggestions/comments may also be useful.

**Major compulsory revisions**

**Methods paragraph 1**

"Weight control program on periodontal tissue..." This study did not assess periodontal tissue as this can only be done with biopsy. They are evaluating the gingival fluid markers and are assuming the validity of the results.

There are published studies correlating gingival tissue biopsies and gingival crevicular fluid but the authors have not addressed this in their review of the literature. There is also no discussion in the introduction why they chose to use MMP-8 as the primary variable.

**Methods paragraph 3**

What is obesity index? Should it read Measures of obesity including BMI, WHR etc. were recorded...

"to check the change of tooth" does not make sense as they are evaluating gingival tissue.

"Dentist trained by national oral examination criteria" - was there any calibration or training. The plaque and gingival index are difficult to interpret even by trained periodontal specialists. They require very careful assessment of reproducibility.
This weakens the data and there had not been any discussion regarding this. The small change in visual examination would be smaller than the error of these recordings. I don't believe the gingival index adds any value to the manuscript. It usually reported as a mean for a single site, sample sites or for the whole patient. Research has also shown that the levels of inflammatory mediators vary according to the presence of bleeding on probing (a more reliable marker of gingival inflammation) and this manuscript does not discuss the condition of the gingival tissues where the samples were taken.

Statistical analysis
"Student's t test .....” sentence is too long. How was dental plaque index adjusted? With such a high recording error is this necessary? What is the impact of this adjustment?

Results paragraph 2
"The results in table 3..... does not make it clear why the table is half empty. Could the sentence start "Table 3 demonstrates the positive correlations between.... (non-significant data omitted).

Employed may not be the correct word...."Linear regression was used...” r=0.137 should be recorded near the 13.7% variance as the table and text do not clarify how you came up with the 13.7%. It is written very small under the table and hard to find.

Discussion
Line 1 - large statement without good evidence (only citing a review). Soften the tone of the sentence unless a stronger paper is found to support your statement.

Line 3 - Obesity and periodontitis share the same cytokine markers but there is no evidence that their pathophysiology is the same. There could be the potential for an interaction as suggested by animal models.

Line 6 - "Kim et al ....." reference does not seem to link with the rest of the paragraph. Line 9 - Paragraph discusses three studies but does not link their relevance. Paragraph 3 What is the meaning of local condition? It is the gingiva? The remaining paragraph does not have a clear message and does not assess the cited studies.

Paragraph 4 – “but change in proinflammatory cytokines” Is the study on systemic or gingival cytokines?

Paragraph 5 - “The study, however, .....” which study? The current study or the one just discussed. Might read better as “Our study or the current study....”

Paragraph 6 - "We found obesity and periodontal indicators....” What is the significance of the 13% variance as it is not discussed.

Paragraph 7 - Last sentence in discussion is not clear.

Discussion should also mention the limitations of the study:
Subject selection: effect of periodontitis vs gingivitis vs gingival health on GCF sampling. How are these disease states differentiated?
GCF sampling technique - what it measures and how accurate is it.
Could serum be re-analysed to see if the Serum and gingival cytokines correlate? For example, if the serum reduces by 20% with weight loss does that also result in a 20% reduction in gingival inflammatory markers? This would be very interesting data.

Conclusion:
Using the word "periodontal inflammation and obesity indicators" do not accurately describe what was studied.

General comments:
Figures are not clear especially the quality of Figure 1. The detail in Figure 2 is hard to interpret and will be even harder when printed in a smaller size.
Table 2 is too large and could be separated into obesity and dental data. It would also be better to provide initial and post treatment values not just the changes.
Table 3 does not explain the empty spaces.

Minor issues not for publication
Abstract
Background line 2 - exercise training in high fat mice or rats can inhibit inflammations effectively in gingival tissue (grammar) Background line 4 - "effect periodontal indexes and biomarkers in young Koreans" could include the words "serum and GCF biomarkers in young Koreans" which would help clarify their aim.
Methods line 1 - consistency in formatting for example spacing between volunteers (body mass index) and also between index and BMI. In addition, BMI is an index and therefore, has no units.
Methods line 2 - the word “to observe” does not seem correct and perhaps an alternative such as "to analyse the changes in anthropometric criteria....." this also implies use of statistics.
Results line 1 - the use of criteria in "the means of obesity criteria decreased significantly" does not appear to be the correct use of the word. Anthropometric measurements were measured not "obesity criteria"
Results line 7 - obesity indexes and GCF biomarkers had weak positive correlation adjusted.... (grammar) Conclusions line 1 - (sentence structure)...
Reverse sentence to.... In periodontally healthy subjects weight control could reduce the levels of inflammatory markers in gingival crevicular fluid in both obese and normal weight subjects. Their use of the term periodontal biomarkers is too vague.

Manuscript body
Background paragraph 1
“The preventive programs of periodontal....” grammar and sentence order
Grammar and incorrect use of "attentive". Avoid starting a sentence with the use of "after" and incorrect use of the words "dental professionals became more attentive"

Cross-sectional studies cannot be used to support "obesity is a risk factor" "although a positive association......and prospective studies" - the meaning of the sentence is not clear.

Background paragraph 2
Mouse model "best serves research studies relevant to periodontal health and human health" Sentence taken directly from the cited publication does not fit the flow of the sentence in this manuscript and is a common problem throughout the introduction and discussion (no further comments regarding this will be made as there are too numerous to list). This might reflect that the cited papers were not read or were not interpreted correctly. Some citations were taken from the abstracts and do not portray the complexity of the papers.

Grammar “Obese rats fed a cafeteria style diet were shown to develop alveolar bone loss and spontaneous periodontal disease” may be better.
Incorrect use of the word “inversely”
Grammar and inaccurate statement as the quoted study mentions decreased reactive oxygen metabolites while this manuscript stated "Exercise training in high fat diet mice and rats can inhibit inflammations effectively in gingival tissue”
Use of the word “might” twice in the one sentence.
"to follow the intervention controlling the confounding factors” does not make sense. The following sentence describing the aim is too long.

Paragraph 2 is very long
“They were not allowed to have private foods or drinks except drinking water. Because camp life..........gingival inflammation during the program”. Review grammar to improve flow of the paragraph

Methods paragraph 3
Clinical examination and sample collection - remove the (s) Reverse sentence so that ELISA is spelt out in full first. "Enzyme linked immuno...... was used to measure the amounts of .........."
"The representative value..... as a mean of triplicate ______" Experiments may not be the correct word.

Results paragraph 1
Line 3 - "Table 2 summarises the change difference" - Grammar Line 4 - Use of "Obesity indexes" may better as "obesity measures.."
Line 6 - CRP is a marker of systemic inflammation not the inflammation alone.
Line 11 - is a key sentence but is hard to understand
A number of times the authors write "Author et.'s study"... . This may sound better as ....Author et al found..... Also better to blend in to the sentence as the study detail is more importance than the author which can be cited at the end of the sentence.

The authors state obesity prevention but it would be more accurate to describe exercise and diet modification as a treatment for obesity.

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

**Quality of written English:** Not suitable for publication unless extensively edited

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

No to all above, I declare that I have no competing interests.