

Review of: "Relationship between In Vitro Physical Properties and In Situ Biofilm Formation of Fissure Sealants"

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Potential competing interests: No potential competing interests to declare.

Subject: Relationship between In Vitro Physical Properties and In Situ Biofilm Formation of Fissure Sealants: Qeios

Report belonging to the manuscript above

I have carefully reviewed your manuscript. The main purpose of this two-part study is to investigate the effects of the surface properties of two resin sealants (K1, K2), a glass ionomer (Ci) sealant, and a biomimetic hydroxyapatite (BHAP) material on in situ biofilm formation. The study was carried out using four different materials and standardized samples on human enamel (E). The findings show that the roughness of the materials is associated with biofilm formation on BHAP, glass ionomer, and resin sealants. Additionally, it has been determined that the use of hydroxyapatite (HAP) paste contributes to reducing biofilm formation.

And I decided that the study required **minor revision**. The study should be revised as I stated below, along with my reasons. I would like to point out that the work can be evaluated in your journal by making as much revision as possible.

Abstract

I suggest that the abstract should contain a clear conclusion supporting the claim in the title, demonstrating the superiority of the material over other existing bone grafts. Additionally, it is important to include any observed side effects or complications during the healing process for initial review purposes.

Introduction

The introduction section seems quite compatible with the given title. However, providing some additions could offer a clearer and more comprehensive introduction.

1. The introduction should be enriched with more study examples to present the procedure's place in the literature more clearly.
2. The originality of the material choices used in this study should be clearly expressed.
3. I recommend that you open a short paragraph for the materials and characterization methods currently used in this and similar studies.

These additions can enhance the introduction section, providing a more comprehensive background and understanding of the study's importance.

Materials and Methods

1. It will be more useful for the readers if the purpose of the analysis is briefly written in Section 2.1. However, in this section, I suggest some corrections below. These corrections and additions can make the method description more explanatory, aiding in better understanding of the study's details.
2. "Biomimetic hydroxyapatite powder (BHAP) was synthesized using calcium nitrate tetrahydrate $[\text{Ca}(\text{NO}_3)_2 \cdot 4\text{H}_2\text{O}]$ and diammonium hydrogen phosphate with a 1.64 ratio of Ca/P molar ratio and 2.10 g/cm³ density. Details of the synthesis. In the study you mentioned with your definition of "method," the Ca/P ratio was studied as 1.67. How did you measure the 1.64 ratio in your study?"
3. Which load did you analyze using in the indentation experiment? For example, expand your hardness test definition with a sentence such as ""Indentation test loads are applied for 10 seconds at different amounts in the range of N to N.""
4. "Measurements were made with a 4- μm diamond stylus, 90° reading angle, and 0.80 mm cut-off length at five different locations of each sample surface." In the sentence, the phrase "at five different locations of each sample surface" may be more descriptive when indicating where the measurements were made. It can be written as: "Measurements were made with a 4- μm diamond stylus, 90° reading angle, and 0.80 mm cut-off length, taken at five different locations evenly distributed across each sample surface."

Results and Discussion

1. The provided results and discussion section is consistent with the previous abstract and material and methods sections. However, adding more detail and context can facilitate better understanding of the results. The suggested additions could be:
2. "The mean microhardness measurement was highest in enamel (272.6 ± 9.90), followed by the BHAP material (225.75 ± 3.02).". In the sentence, it is stated that the microhardness measurement of the BHAP material is lower than enamel, but it seems like a reverse order is indicated with the expression "followed by".
3. "The glass ionomer had lower (65.60 ± 2.00) microhardness, and two resin sealants were the lowest, but they had similar microhardness (K1: 13.05 ± 1.67 ; K2: 11.36 ± 0.73).". In the sentence, while comparing the microhardness values of the glass ionomer and two resin sealants, the expression "lowest" was used for "glass ionomer", but actually this expression should be used for the resin sealants.
4. "A statistically significant difference was observed between all materials." The sentence states that there is a statistically significant difference between all materials, but then it is stated that only Ci is different from the other materials.
5. It is important to specify the load value for microhardness measurements because microhardness values can vary depending on the amount of load applied. Therefore, the amount of load used should also be specified in addition to the microhardness values. For example, the amount of load used should be stated as well as the microhardness values by stating "The mean microhardness measurement was highest in enamel (272.6 ± 9.90 N), followed by the BHAP material (225.75 ± 3.02 N)".

6. For the Roughness Test, I recommend adding the following points. How was the surface preparation done before the test? At what speed and under what pressure was it used during the measurement?
7. Scale information should be clearly presented in the images obtained in SEM analysis. You must ensure this. It's in the images, but it's not readable.
8. Role of biomaterials development in the healing process: Evaluations can be made on how the research contributes to the field of biomaterial science and how it can guide future research in this area.
9. Comparison of findings with the literature: Further discussion can be made on how the findings of the study can be compared with previous similar studies and what commonalities or differences exist.
10. Limitations of the findings and suggestions for future research: Explanations can be provided regarding the limitations of the study and how these limitations can be addressed or managed in future research. Additionally, recommendations can be made on which areas need further exploration in future studies.

These additions can comprehensively evaluate the study's results, providing readers with a deeper understanding.