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.

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

Abstract

1. Strengthen the clarification of the research objectives, especially in the last paragraph. Clearly state what the researchers aim to achieve with the study.
2. Please add the mean values and standard deviations.

Introduction

1. You can simplify expressions such as 'physical, mechanical, and/or biological properties' to make the text more accessible.
2. You can simplify expressions such as 'physical, mechanical, and/or biological properties' to make the text more accessible.
3. You can simplify expressions such as 'physical, mechanical, and/or biological properties' to make the text more accessible.

Materials and Methods

I suggest describing the methodology in a bullet-point format for clarity. Please outline how you determined the sample size for each test.

Results

In this chapter, only describe the results; address the hypothesis in the discussion.

Discussion, the following improvements could be considered:

In Vitro Experiment

1. **Clarity in Experimental Design:**
    - Clarify the rationale behind choosing BHAP as a replacement for enamel in the in vitro experiment. Briefly explain why BHAP was selected and how it addresses the concerns about contamination risks.

2. **Detailed Presentation of Material Properties:**
   - Provide more details on the properties of BHAP, emphasizing its relevance as a substitute for natural enamel. Explain how BHAP compares to human enamel in terms of microhardness, roughness, and wettability.
3. **Scientific Explanation of Hydroxyapatite Properties:**
   - When discussing HAP powder and its synthesis, consider providing a concise scientific explanation of hydroxyapatite properties for readers who may not be familiar with the terminology.
4. **Logical Flow between Paragraphs:**
   - Ensure a smooth transition between paragraphs, especially when moving from the properties of BHAP to the discussion of dental product properties. This will enhance the overall coherence of the discussion.
5. **Clarification of Research Focus:**
   - Clearly state the specific focus of the examination of microhardness, wettability, and surface roughness of the fissure sealants. Explicitly mention how these properties relate to biofilm development on dental materials.
6. **In-Depth Analysis of Results:**
   - Provide a more in-depth analysis of the results, particularly regarding the differences in physical properties between Ci and resin sealants. Explain the significance of these differences in the context of other studies and their potential implications.
7. **Integration of Previous Research:**
   - Integrate references to previous research more seamlessly, emphasizing the relevance of your results in comparison to existing literature. This will strengthen the contextualization of your findings.
8. **Consistent Terminology:**
   - Maintain consistency in terminology, especially when discussing hydrophobicity. Clarify the terms and cut-off points used in your study for a more straightforward understanding.
9. **Enhance the Connection with Research Objectives:**
   - Reiterate the relevance of the in vitro experiment to the overall research objectives. Clearly link the findings presented here to the broader goals of the study.

In Situ Experiment

1. **Reference Presentation:**
   - Introduce references individually for clarity.

2. **Experimental Procedures:**
   - Provide concise details on how BHAP's biofilm-covered surface was calculated.
3. **In Vivo vs. In Vitro Distinction:**
   - Clearly state limitations of in vitro models in predicting in vivo effects, supported by relevant literature.
4. **Logical Flow of Argument:**
   - Ensure a logical flow in discussing the preference for in vitro studies and their focus on various aspects.
5. **Surface Properties Influence on Biofilm:**
   - Provide more insight into how surface properties influence biofilm formation.
6. **Correlation Analysis Presentation:**
   - Clearly present the correlation between Ra values and biofilm formation.
7. **Interpretation of Findings:**
   - Expand on the interpretation of the negative correlation between microhardness and biofilm formation, relating to existing literature.
8. **Link to Wear and Acidic Environment:**
   - Connect wear, acid challenge, and their influence on biofilm formation more explicitly.
9. **Concluding Statements:**
   - Conclude with a summary of key findings and their implications for future research.
10. **Biofilm Reduction:**
    - Specify the observed reduction in biofilm on BHAP, resins, and glass ionomer. Provide quantitative data.
11. **Confirmation of Reduction Pattern:**
    - Align the reduction pattern with the structural resemblance of HAP nanocrystals to enamel crystallites [52].
12. **Bio-Physicochemical Influences:**
    - Connect bio-physicochemical influences to observed biofilm establishment, referencing Nel et al [53].
13. **Effect of HAP Paste:**
    - Clarify the indirect effect of the HAP paste, integrating Luo et al [54] more cohesively.

14. **Main Outcome and Dental Applications:**
    - State the main outcome: HAP paste may reduce biofilm adhesion. Reference the recent review on dental applications of HAP nanoparticles [55].
15. **Biofilm Presence vs. Clinical Significance:**
    - Emphasize the distinction between biofilm presence and potential clinical effects. Clarify limitations in assessing significance.
16. **Recent Methodological Advances:**
    - Briefly mention recent advances in studying biofilms, highlighting uncertainty in clinical significance.