

Subject: [BDS] Editor Decision

Lyzia Rezende, Evanildo Paz, Glauber Campos Vale:

We have reached a decision regarding your submission to Brazilian Dental Science, "Physicochemical and mechanical performance of a bioactive resin compared with conventional restorative materials under erosive challenge".

Our decision is: Resubmit

Reviewer A:

Recommendation: Revisions Required

Questionnaire

Does the manuscript contain new and significant information to justify publication?*

Yes

Does the Abstract (Summary) clearly and accurately describe the content of the article?

Yes

Is the problem significant and concisely stated?

Yes

Are the methods or research design described comprehensively? Is the statistical analysis adequate?

Yes

Are the interpretations and conclusions justified by the results?

Yes

Is adequate reference made to other work in the field?

Yes

Is the language acceptable?

Yes

Manuscript Structure

Length of article is:*

Adequate

Number of tables is:

Adequate

Number of figures is:

Adequate

Please state any conflict(s) of interest that you have in relation to the review of this paper (state “none” if this is not applicable).

None

Rating

Interest*

Good

Quality

Good

Originality

Good

Overall

Good

Recommendation

Major Revision

Would you be willing to review a revision of this manuscript?

Yes

Comments

Comments to the Author

Thank you for the opportunity to review your manuscript. The study addresses a relevant and timely topic in restorative dentistry, particularly considering the growing interest in bioactive restorative materials and their performance under erosive conditions. Overall, the manuscript is well structured, and the topic is of clinical and scientific relevance. The experimental design is appropriate, and the findings contribute valuable information to the current literature. However, some methodological clarifications, statistical considerations, and improvements in data interpretation and standardization are necessary to strengthen the manuscript. My specific comments are provided below.

Abstract

The methodology was described objectively; however, important details regarding the erosion protocol are missing, such as the type of solution used, the daily exposure time, and the cyclic nature of the challenge.

The results are well presented but in a largely descriptive manner, lacking relevant quantitative data (such as fluoride release values, hardness loss, and significance levels), which limits the abstract's informative value.

The mention of classification and solubility could be better integrated into the results, as these represent important stages of the study.

The conclusion is consistent with the findings but offers an interpretation that is somewhat broad for an *in vitro* study; a more cautious wording would be preferable.

796

Introduction

The text demonstrates good logical progression, starting with the importance of bioactive materials, moving to the role of fluoride, and culminating in the clinical relevance of the erosive challenge.

However, there is some redundancy between the paragraphs addressing fluoride release and its effects on the oral environment, which compromises the section's conciseness. It is recommended to condense this information to improve the text's flow.

The study's scientific rationale is present but could be strengthened by placing greater emphasis on the limitations of current knowledge regarding the behavior of bioactive resins under erosive conditions.

The transition between the discussion on bioactivity and the impact of erosive conditions could be more integrated, thereby making the scientific rationale more robust.

Methodology

The sample size calculation was described and justified based on a pilot study, which strengthens the experimental design. However, it is recommended to present the statistical parameters used—such as effect size and the rationale for the minimum detectable difference—more clearly.

The specimen preparation protocol is well described; however, minor grammatical and terminological adjustments could improve the text's clarity and technical precision.

The erosive challenge protocol is well-founded and clinically relevant, simulating exposure to an acidic beverage and remineralization periods. Nevertheless, it is recommended to clarify whether the solutions and artificial saliva were renewed

daily throughout the experiment.

The methodology for assessing fluoride release is adequate, but the description of the cumulative release calculation could be detailed further to facilitate understanding.

Regarding the hardness analysis, the formula used to calculate the percentage of surface hardness loss should be reviewed, as the presented format could lead to an incorrect interpretation of the values.

In the sorption and solubility section, inconsistencies in the standardization of measurement units (mg/mm^3 and $\mu\text{g}/\text{mm}^3$) were observed; standardization is required.

The statistical analysis is clearly described; however, given the multifactorial nature of the fluoride release data (material $\times$ solution $\times$ time), it is recommended to re-evaluate the statistical model adopted to ensure greater analytical robustness.

Results

The findings regarding fluoride release were presented consistently, adequately demonstrating the differences between materials, solutions, and experimental periods. However, given the complexity of this outcome, the presentation could be strengthened by a more robust statistical analysis compatible with the multifactorial design.

The results for sorption and solubility were described succinctly and objectively; however, the presence of negative values warrants review or clarification, as it may raise questions regarding the calculation or interpretation of the data.

There are minor inconsistencies in the standardization of table numbering (“Table 02” and “Table 03”); standardization is recommended to maintain the editorial format.

Conclusion

However, the conclusion presents certain inferences that may be considered broad for a study conducted exclusively *in vitro*, particularly regarding the suggestion of direct clinical applicability. Greater caution is recommended when extrapolating the findings to clinical practice.

It is suggested to emphasize that the results are limited to the experimental conditions employed and that further studies, especially *in situ* and clinical trials, are required to confirm the material's behavior in the actual oral environment.

Reviewer C:

The present study evaluated the physicochemical and mechanical properties of a bioactive resin in comparison with a conventional resin and a resin-modified glass ionomer cement under an erosive challenge. The topic is clinically relevant, and the manuscript is generally well written and well organized. However, some issues should be addressed to further strengthen the quality and scientific rigor of the manuscript.

- Introduction section: It would be beneficial to expand the background on how erosive challenges affect the physicochemical and mechanical properties of restorative materials. In addition, the authors should more clearly identify the gap in the literature that motivated this study.
- The authors state that the sample size calculation was based on a pilot study. However, the manuscript does not specify which outcome variable was used as the primary endpoint for this calculation.
- The authors should explain why the adopted erosive challenge protocol was considered representative of a clinically relevant erosive condition and discuss whether it reflects a moderate or severe level of exposure to dietary acids.
- For the statistical analysis of fluoride release, the authors used one-way ANOVA followed by Tukey's post hoc test. Wouldn't a repeated-measures ANOVA be more appropriate for these data?
- Discussion section: The authors should further discuss the clinical situations in which the bioactive resin may provide greater benefits (e.g., patients with gastroesophageal reflux disease or those with a high intake of acidic beverages). In addition, they should clarify that fluoride release alone does not guarantee clinical protection against dental erosion or improved longevity of restorative materials.

Recommendation: Revisions Required

Brazilian Dental Science