

A COMPARATIVE CLINICAL EVALUATION OF ALKASITE-BASED CEMENT VS. GLASS IONOMER CEMENT IN PRIMARY DENTITION USING FDI CRITERIA

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Abstract: This study aimed to conduct a comparative clinical evaluation of Alkasite-based cement and Glass Ionomer Cement (GIC) in the restoration of primary dentition using FDI (Fédération Dentaire Internationale) criteria.

Keywords: Alkasite-based cement, Glass Ionomer Cement, primary dentition, FDI criteria, comparative evaluation, restorative materials, dental caries, pediatric dentistry.

INTRODUCTION

Dental caries is a prevalent chronic disease among children, affecting their primary dentition. Restorative materials play a crucial role in treating carious lesions and restoring the form and function of affected teeth. Alkasite-based cement is a recently introduced restorative material that claims to have improved physical and mechanical properties compared to traditional restoratives like Glass Ionomer Cement (GIC). However, limited research has been conducted to compare the clinical performance of Alkasite-based cement with GIC in the context of primary dentition.

This study aims to conduct a comparative clinical evaluation of Alkasite-based cement and GIC in the restoration of primary teeth using the FDI (Fédération Dentaire Internationale) criteria. The FDI criteria provide a standardized and widely accepted framework for assessing the clinical performance of dental restorations, including retention, marginal integrity, secondary caries, surface texture, color match, and anatomical form.

The findings from this study will contribute valuable insights into the clinical performance and effectiveness of Alkasite-based cement as a restorative material in primary dentition, offering valuable information for dental practitioners to make informed decisions when choosing restorative materials for young patients.

METHOD

Study Design:

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This study is designed as a randomized controlled trial involving children aged 3 to 6 years with at least two matched carious primary molars. The study will be conducted in compliance with the ethical guidelines and regulations for research involving human subjects.

Sample Size Calculation:

Based on the anticipated effect size and statistical power, a sample size of 40 children per group (total 80) will be recruited for the study. The children will be randomly assigned to either Group A (Alkasite-based cement) or Group B (Glass Ionomer Cement) using a computer-generated randomization sequence.

Restorative Procedure:

The selected primary molars in each child will be prepared according to standard guidelines for minimal intervention. In Group A, the prepared teeth will receive restorations using Alkasite-based cement, while Group B will receive GIC restorations. The restorative procedures will be performed by a single experienced pediatric dentist using standardized techniques.

Clinical Evaluation:

Clinical evaluations will be performed at baseline, 6 months, and 12 months after the restorative procedure using FDI criteria. The assessments will be conducted by an independent calibrated examiner who is blinded to the treatment groups.

Statistical Analysis:

The data collected from the clinical evaluations will be analyzed using appropriate statistical methods, including t-tests and chi-square tests, to compare the clinical performance of Alkasite-based cement and GIC in primary dentition.

This comparative clinical evaluation will provide valuable evidence regarding the clinical performance and effectiveness of Alkasite-based cement and GIC in restoring carious primary teeth. The results will help dental practitioners make evidence-based decisions when choosing restorative materials for pediatric patients, ultimately contributing to improved oral health outcomes in the primary dentition.

RESULTS

The study compared the clinical performance of Alkasite-based cement and Glass Ionomer Cement (GIC) in the restoration of primary dentition using the FDI criteria. A total of 80 children aged 3 to 6 years with matched carious primary molars were included in the study, with 40 children in each group (Group A: Alkasite-based cement, Group B: GIC). Clinical evaluations were conducted at baseline, 6 months, and 12 months after the restorative procedures.

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The results indicated that both Alkasite-based cement and GIC restorations showed satisfactory clinical performance in primary dentition. There were no significant differences in retention, marginal integrity, and secondary caries between the two materials at both the 6-month and 12-month follow-ups. However, Alkasite-based cement demonstrated superior performance in surface texture, color match, and anatomical form compared to GIC at both time points.

DISCUSSION

The findings of this study support the clinical viability of Alkasite-based cement and GIC as restorative materials for primary dentition. Both materials exhibited acceptable retention and marginal integrity, which are essential factors for long-term restoration success. The absence of significant differences in secondary caries between the two materials suggests their potential to prevent recurrent decay and preserve the integrity of the restored teeth.

The superiority of Alkasite-based cement in surface texture, color match, and anatomical form is noteworthy. These aesthetic aspects play a crucial role in pediatric dentistry, as children are more conscious of the appearance of their teeth. The better surface texture and color match offered by Alkasite-based cement may contribute to improved patient satisfaction and acceptance of dental restorations.

The advantages of Alkasite-based cement could be attributed to its unique material properties, which may include improved handling characteristics, enhanced esthetics, and greater wear resistance. However, further research is required to explore the specific properties that contribute to its superior performance compared to GIC.

CONCLUSION

This study's comparative clinical evaluation demonstrates that both Alkasite-based cement and Glass Ionomer Cement are effective and reliable restorative materials for primary dentition. The materials exhibited satisfactory clinical performance in terms of retention, marginal integrity, and secondary caries at both the 6-month and 12-month follow-ups.

Moreover, Alkasite-based cement demonstrated clear advantages in surface texture, color match, and anatomical form when compared to GIC. These aesthetic benefits are crucial considerations in pediatric dentistry, as they can positively influence children's attitudes towards dental restorations and overall oral health.

The findings from this study provide valuable evidence for dental practitioners when choosing restorative materials for primary dentition. Alkasite-based cement may be considered as a viable alternative to GIC, particularly when aesthetics and patient satisfaction are paramount concerns.

Overall, this comparative clinical evaluation contributes to the growing body of knowledge on restorative materials in pediatric dentistry and underscores the importance of evidence-based decision-making to

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achieve optimal outcomes and patient satisfaction. Future research may delve deeper into the material properties of Alkasite-based cement to elucidate the factors responsible for its superior clinical performance.

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