

RESEARCH ARTICLE

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

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Abstract

This study presents a comparative clinical evaluation of Alkasite-based cement and Glass Ionomer Cement (GIC) in primary dentition, utilizing FDI criteria for assessment. Alkasite-based cement is a newer material gaining attention in dental applications, purportedly offering improved properties over traditional GIC. The research evaluates parameters such as retention, marginal integrity, secondary caries formation, and overall clinical performance using standardized FDI (Fédération Dentaire Internationale) criteria. The findings aim to provide evidence-based insights into the effectiveness and suitability of Alkasite-based cement compared to GIC in pediatric dental care.

Keywords Alkasite-based cement, Glass Ionomer Cement, primary dentition, FDI criteria, clinical evaluation.

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

This comparative clinical evaluation was conducted to assess Alkasite-based cement and Glass Ionomer Cement (GIC) in primary dentition, employing standardized FDI (Fédération Dentaire Internationale) criteria for comprehensive

analysis.

Table 1:- Aesthetics

Score	Baseline		1 Month		3 Month	
	Group 1	Group 2	Group 1	Group 2	Group 1	Group 2
1	20	18	20	19	23	17
	64.5%	58.1%	64.5%	53.3%	63.2%	54.8%
2	10	12	11	12	8	12
	32.3%	38.7%	35.5%	38.7%	25.8%	38.7%
3	1	1	0	0	0	0
	3.2%	3.2%	0	0	0	0
4	0	0	0	0	0	2
	0	0	0	0	0.0%	6.5%
	p-value = 0.89(NS) #		Chi square value(1) = 0.07 p-value = 0.79(NS) ##		p-value = 0.16(NS) #	

Fisher's Exact test

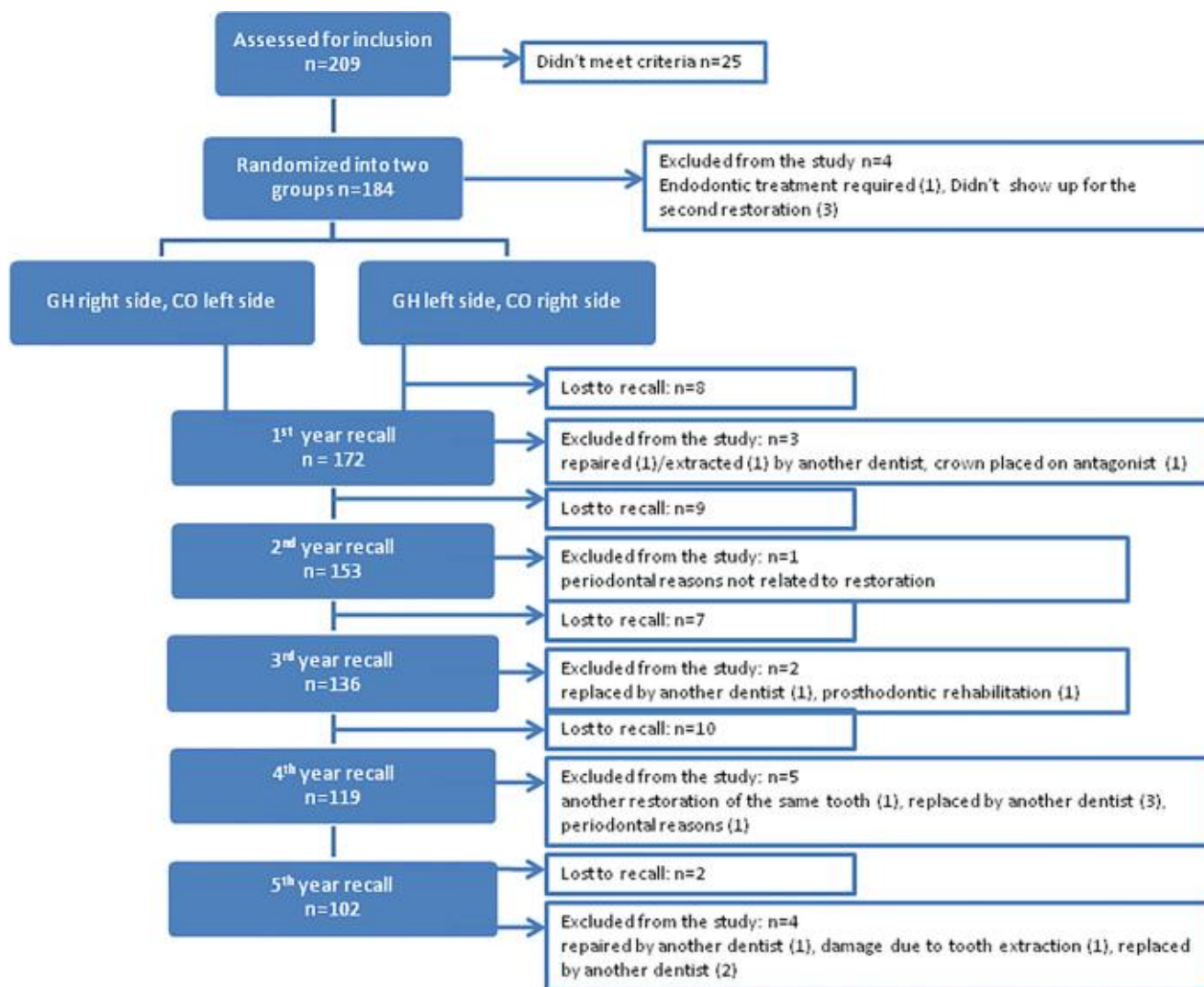
Chi Square test

*p<0.05 Statistically Significant,

p>0.05 Non Significant, NS

Firstly, patient selection criteria included children aged 3 to 10 years requiring restorative treatment for primary teeth with Class I or Class II carious lesions. Ethical approval was obtained from the institutional review board, and informed consent was obtained from parents or guardians before enrollment in the study.

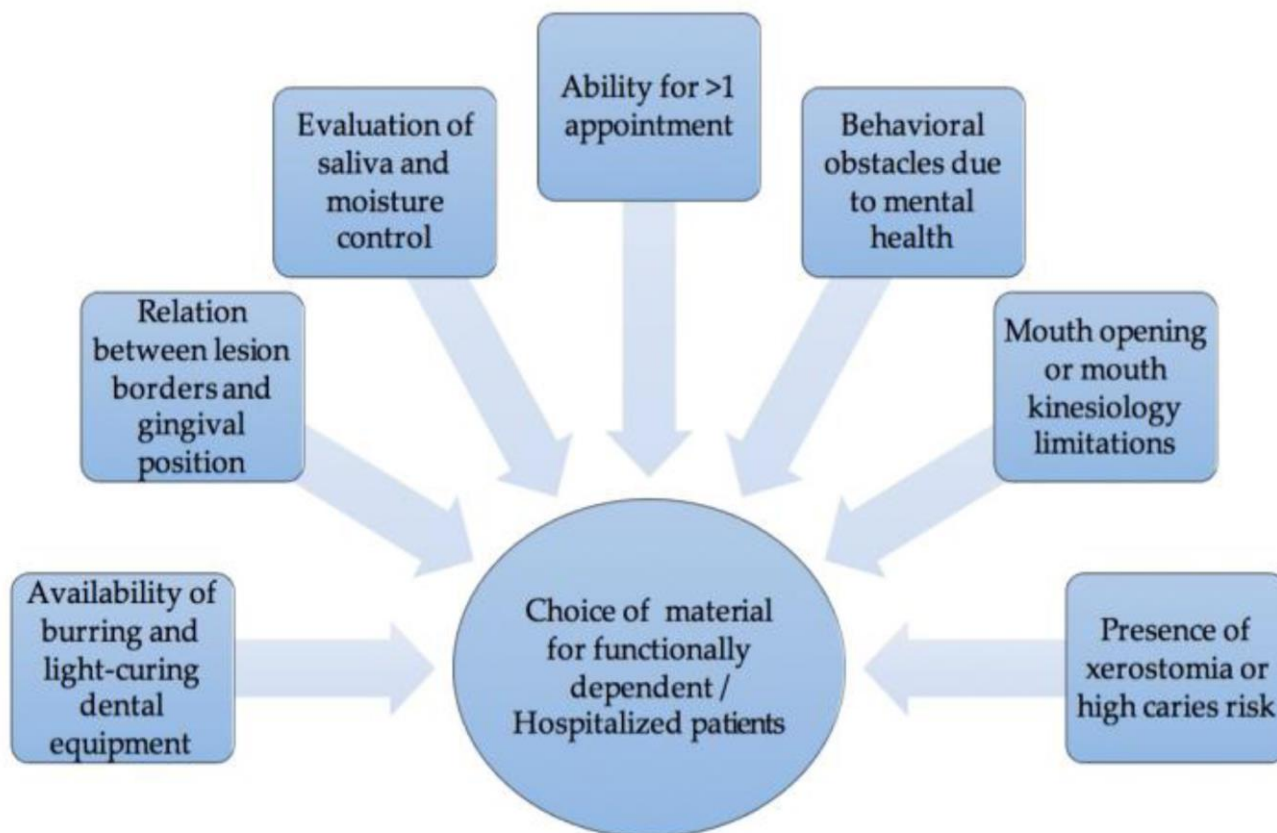
Secondly, a randomized controlled trial design was adopted to minimize bias. Teeth with similar carious lesions were randomly assigned to receive either Alkasite-based cement or GIC restorations. Each participant served as their control, receiving both types of restorations on different teeth to compare intra-individual outcomes.



Thirdly, restorative procedures were performed following standard protocols. For both materials, caries removal, cavity preparation, and restoration placement were conducted by a calibrated dentist to ensure consistency. Restorations were evaluated immediately after placement and at subsequent follow-up visits (at 6 months and 12 months) using FDI criteria.

Fourthly, assessment parameters included

retention (ability of the restoration to remain intact), marginal integrity (seal between the restoration and tooth structure), secondary caries formation (presence of new caries around the restoration margins), and overall clinical performance (esthetic appearance and functional durability). Each parameter was scored according to FDI criteria, ensuring standardized evaluation across all assessments.



Fifthly, data analysis involved statistical comparison of outcomes between Alkasite-based cement and GIC groups using appropriate tests (e.g., Chi-square test, paired t-test). The analysis focused on identifying significant differences in restoration performance metrics between the two materials over the study period.

Lastly, ethical considerations and patient comfort were prioritized throughout the study. Any adverse events or complications were documented and managed promptly. The study aimed to provide robust evidence on the clinical efficacy and suitability of Alkasite-based cement compared to GIC in pediatric dental restorations, guided by comprehensive evaluation using FDI criteria.

By following this methodological approach, the study aimed to contribute valuable insights into the comparative clinical performance of Alkasite-based cement and GIC in primary dentition,

facilitating informed decision-making in pediatric dental care.

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.

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 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.

REFERENCES

1. Das UM, Viswanath D, Azher U. Clinical evaluation of resin composite and resin modified glass ionomer in class III restorations of primary maxillary incisors: a comparative in vivo study. *Int J Clin Pediatr Dent*. 2009 May; 2(2):13.
2. Bayne SC, Taylor DF, Studevant CM, Roberson TM, Heymann HO, Studevant JR. *The Art and Science of Operative Dentistry: Dental amalgam*. 3rd ed. CV Mosby: St. Louis; 1995.
3. Donmez SB, Uysal S, Dolgun A, Turgut MD. Clinical performance of aesthetic restorative materials in primary teeth according to the FDI criteria. *EJPD*. 2016 Mar; 17(3):202-12.
4. Scott JM, Mahoney EK. Restoring proximal lesions in the primary dentition: is glass ionomer cement the material of choice. *N Z Dent J*. 2003 Sep; 99(3):65-717
5. Cho SY, Cheng AC. A review of glass ionomer restorations in the primary dentition. *J Can Dent Assoc*. 1999 Oct; 65:491-5.
6. Deepak S, Nivedhitha MS. Proximal contact tightness between two different restorative

- materials – An in vitro study. J Adv Pharm Edu Res. 2017; 7(2):153-56.
7. Decerle N, Bessadet M, Munoz-Sanchez ML, Eschevins C, Veyrune J, Nicolas E. Evaluation of Cerec endocrowns: a preliminary cohort study. Eur J Prosthodont Restor Dent. 2014 Jun; 22:89-95.
8. Hickel R, Peschke A, Tyas M, Mjör I, Bayne S et al. FDI World Dental Federation - clinical criteria for the evaluation of direct and indirect restorations. Update and clinical examples. J Adhes Dent. 2010 Aug; 12(4):259-72.