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Original Article

Efficacy of Composite Resin and Resin-Modified Glass Ionomer Cement for Class III Restorations- A Clinical Study

Shruti Sharma¹, Varun Rajkumar², Sipra Sarin³, Sahil Sarin⁴, Charanpreet Singh Chugh⁵, Rajdeep Kaur⁶

¹BDS, Private Practitioner, Delhi, ²MDS, Private practitioner, Delhi, ³MDS, Private Practitioner, Punjab, ⁴MDS, Assistant professor, Department of Prosthodontics, Genesis Institute of Dental Sciences & Research, Punjab, ⁵MDS, Private Practitioner, Punjab, ⁶BDS, Private Practitioner, Punjab

ABSTRACT:

Background: Dental composite resins are types of synthetic resins which are used in dentistry as restorative material or adhesives. The resin-modified glass ionomer cement is the most frequently used cement for the cementation of well-fitting porcelain-fused-to-metal (PFM) crowns. The present study was conducted to compare the efficacy of composite resin and resin-modified glass ionomer cement (RGIC) for class III restorations. **Materials & Methods:** The present study was conducted in the department of Endodontics. It included 40 patients with class III cavity of both genders. All the patients were divided into two study groups. Group I were of composite resin cement and group II were of resin-modified glass ionomer cement. **Results:** Each group had 20 number of patients. The mean value of anatomical shape in group I was 1.2 and in group II was 1.06, adaptation of margin was 1 in group I and 1.2 in group II, discoloration of margin was 1 in group I and 1.1 in group II and secondary caries was 1 in both groups. The difference was non-significant ($P > 0.05$). **Conclusion:** Both the restorative materials found to be equally effective in class III restoration in primary anterior teeth. Anatomical shape, adaptation of margin, discoloration of margin and secondary caries in both groups were almost of same intensity. **Key words:** Composite resin, Resin-modified glass ionomer cement, Secondary caries.

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Corresponding Author: Dr. Shruti Sharma, BDS, Private Practitioner, Delhi,

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INTRODUCTION

The practice of dentistry is an integral component of children's health care. Generally dentists and pediatric dentists have been providing this type of care with the intent to provide optimal oral health. Pain is the main complaint for which patient visits to the dentist. Well-aligned and well-designed bright white teeth form the beauty standards in today's modernized world scenario. Patients routinely report to dental clinics with the chief complaint of caries, malformations, fractures of teeth, change in physiologic coloration of teeth, etc. One of the major infectious diseases which is difficult to control and forms a major health issue among general public population is caries. Literature quotes

very few studies highlighting the long-term follow-up data of restorative treatments of primary anterior teeth.¹

Dental composite resins are types of synthetic resins which are used in dentistry as restorative material or adhesives. Dental composite resins have certain properties that will benefit patients according to the patient's cavity. It has a micro-mechanic property that makes composite more effective for filling small cavities where amalgam fillings are not as effective and could therefore fall out. Synthetic resins evolved as restorative materials since they were insoluble, of good tooth-like appearance, insensitive to dehydration, easy to manipulate and reasonably inexpensive.²

The resin-modified glass ionomer cement is the most frequently used cement for the cementation of well-fitting porcelain-fused-to-metal (PFM) crowns, full-cast crowns, and high-strength ceramic restorations. It is the same resin used in resin-based composite, only in a smaller percentage. This combination of ingredients provides the following desirable properties for restoration of teeth. RMGI bonds to tooth structure with a natural anatomic chemical bond.³ The present study was to compare the efficacy of composite resin and resin-modified glass ionomer cement (RGIC) for class III restorations.

MATERIALS & METHODS

The present study was conducted in the department of Endodontics. It included 40 patients with class III cavity of both genders. All were informed regarding the study and written consent was obtained. Ethical clearance was taken from institutional ethical committee.

General information such as name, age, gender etc. was recorded. All the patients were divided into two study groups. Group I were of composite resin cement and group II were of resin-modified glass ionomer cement. Shade guide was used to select suitable color shade of the composite. Both restorations were done in their respective groups. Results were tabulated and subjected to statistical analysis. P value < than 0.05 was considered significant.

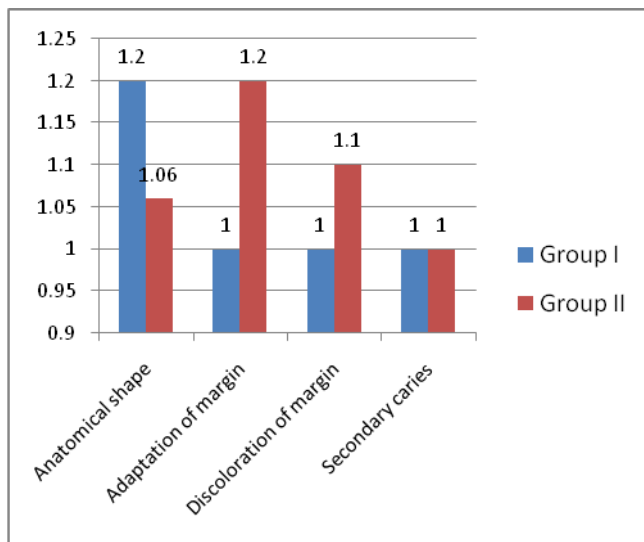
RESULTS

Table I Distribution of patients

Total- 40		
Group I	Group I	P value
20	20	1

Table I shows that both groups had 20 patients each. The difference was non-significant (P= 1).

Graph I: Clinical parameters between RGIC and composite after 6 months interval



Graph I shows that the mean value of anatomical shape in group I was 1.2 and in group II was 1.06, adaptation of margin was 1 in group I and 1.2 in group II, discoloration of margin was 1 in group I and 1.1 in group II and secondary caries was 1 in both groups. The difference was non-significant (P> 0.05).

DISCUSSION

One of the important aims in restorative dentistry is to conserve tooth structure during the cavity preparation and removal of caries. As with other composite materials, a dental composite typically consists of a resin-based oligomer matrix, such as a bisphenol A-glycidyl methacrylate (BISGMA), urethane dimethacrylate (UDMA) and an inorganic filler such as silicon dioxide (silica). Without a filler the resin wears easily, exhibits high shrinkage and is exothermic. Compositions vary widely, with proprietary mixes of resins forming the matrix, as well as engineered filler glasses and glass ceramics.⁴

Glass ionomer sealants are thought to prevent caries through a steady fluoride release over a prolonged period and the fissures are more resistant to demineralization, even after the visible loss of sealant material. These sealants have hydrophilic properties, allowing them to be an alternative of the hydrophobic resin in the generally wet oral cavity. Resin-based sealants are easily destroyed by saliva contamination.⁵ Chemically curable glass ionomer cements are considered safe from allergic reactions but a few have been reported with resin-based materials. Nevertheless, allergic reactions are very rarely associated with both sealants. In present study, we evaluated and compared the efficacy of composite resin and resin-modified glass ionomer cement (RGIC) for class III restorations in anterior teeth.⁶

We found that the mean value of anatomical shape in group I was 1.2 and in group II was 1.06, adaptation of margin was 1 in group I and 1.2 in group II, discoloration of margin

was 1 in group I and 1.1 in group II and secondary caries was 1 in both groups. This is in agreement with Bansal et al.⁷ Ashok et al.⁸ compared the clinical performance of composite biological restoration with stainless steel band for coronal building of mutilated deciduous anterior teeth. They randomly selected 20 patients of age group 3 to 6 years who presented with the chief complaint of mutilated deciduous anterior teeth due to caries. From the results, they concluded that most satisfying esthetic results for anterior teeth rehabilitation was found in case of biological restorations. Deliperi⁹ evaluated the effectiveness of whitening of teeth with nonvital pulp along with clinical performance of direct composite restorations, which were used for reconstructing endodontically bleached teeth. They analyzed 21 patients and from the results concluded that after completion of whitening therapy on teeth with devitalized pulp, significant amount of tooth bleaching was observed. In a study by Miwas et al.¹⁰, for composite and RGIC restorations, the mean score for anatomic shape was 1.21 and 1.10 respectively. While comparing the clinical parameters, nonsignificant results were obtained between composite and RGIC restorative materials at 4, 8, and 12 month interval. On comparing the clinical parameters for individual restorative materials at different time intervals, statistically significant results were obtained only for anatomical shape and form.

CONCLUSION

Anatomical shape, adaptation of margin, discoloration of margin and secondary caries in both groups were almost of same intensity. Both the restorative materials found to be equally effective in class III restoration.

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