

Choice of restorative materials by dentists in Class III dental caries in primary maxillary lateral incisors in 3-6-year-old children: A retrospective study

S. Kamala Devi,
Deepa Gurunathan, G. Divya,
S. Padmapriya

Department of Pedodontics and Preventive Dentistry, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai, Tamil Nadu, India

J. Adv. Pharm. Technol. Res.

ABSTRACT

Early childhood caries has an intricate etiology and it requires a helpless tooth surface, fermentable starches, and cariogenic microorganisms throughout some undefined time frame to start the carious cycle. Tooth-hued materials gained popularity in recent years for reestablishing primary and youthful blended dentitions. Hence, the main aim of this study was to investigate the choice of restorative materials in Class III dental caries in primary maxillary lateral incisors in 3–6-year-old children. Data collected from the records of the children 3–6 years of age for the choice of restorative materials of primary maxillary lateral incisors between September 2020 and February 2021 were included in the study. Retrospective study data were collected through the software DIAS and data analysis was carried out using Chi-square tests. Variation in the percentage of children who underwent restoration utilizing strip crowns was the highest within 3–4 years (38.26%) when compared to light composite restorations (LCR) (14.9%), whereas the least preferred restoration was glass-ionomer cement (5.37%) which was noted statistically significant. Considering the age group of 5–6 years preferred form of restoration was LCR (19.80%) when compared to strip crown (17.79%), whereas 4.70% of the treatment cases were utilized for glass-ionomer cement restorations. Strip crowns are a more predominantly used choice of restorative material in Class III dental caries in primary maxillary lateral incisors in between 3- and 6-year-old children.

Key words: Choice, dental caries, etiology, prevalence, restorative materials

INTRODUCTION

Tooth-hued materials gained popularity in recent years for reestablishing primary and youthful blended dentitions.

Address for correspondence:

Dr. Deepa Gurunathan,
Department of Pedodontics and Preventive Dentistry, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai, Tamil Nadu, India.
E-mail: deepag@saveetha.com

Submitted: 18-Apr-2022

Revised: 13-Jun-2022

Accepted: 14-Jun-2022

Published: 30-Nov-2022

Access this article online

Quick Response Code:



Website:

www.japtr.org

DOI:

10.4103/japtr.japtr_130_22

Notwithstanding amalgam and tempered steel crowns, improved ordinary glass-ionomer concretes and composite saps, gum-modified glass ionomer concretes, and polyacrylic corrosive modified composites (compomers) have become available.^[1]

Adhesive remedial materials have permitted more conservative depression arrangements, prompting minimized designs.^[2] Until this point in time, in pediatric dental literature, no consistent guidelines have been put

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: WKHLRPMedknow_reprints@wolterskluwer.com

How to cite this article: Devi SK, Gurunathan D, Divya G, Padmapriya S. Choice of restorative materials by dentists in Class III dental caries in primary maxillary lateral incisors in 3–6-year-old children: A retrospective study. *J Adv Pharm Technol Res* 2022;13:S50-4.

forward for cavity plan and material determination and choice appear dependent on clinician discernment.^[3]

The commonness of dental caries in youngsters has extraordinarily diminished in the course of recent years in created nations. Be that as it may, countless kids are as yet influenced through caries from an exceptionally youthful age.^[4] In created nations, the infection is supposed to be connected to kids from lower financial foundations where more elevated levels of sickness are found in kids from more unfortunate, less accomplished, single parent, or late settler families.^[5]

A definitive objective of reestablishing rotted essential incisors and canines is to permit the patient to hold these teeth. This permits characteristic shedding with no pulpal difficulties.^[6] In the past, the answer for reclamation of such teeth has been extraction or on the other hand rebuilding of Class III, IV, and V holes with plastic materials such as composites, compomers, or Glass ionomer cement (GICs).^[7]

The presentation of composite strip crowns in the 1970s empowered the pediatric dental specialist to give strong and stylishly satisfactory rebuilding of various essential incisors.^[8] This methodology is viewed as the highest quality level rebuilding of maxillary incisors with broad or multisurface carious injuries.^[9]

It is anyway imperative to specify that this is a method touchy strategy and requires great patient collaboration and ideal confinement. As a considerable lot of the patients with early childhood caries are under an agreeable age, at that point it is not generally conceivable to do gum composite strip crown rebuilding efforts except if under General Anesthesia (GA).^[10] Reclamation of interproximal caries in the mandibular essential incisors is a much more prominent test than for the maxillary teeth; there are no preformed crowns for these teeth and with the mash chamber so moderately near the lacquer layer planning of these teeth without iatrogenically causing pulpal openness is troublesome.^[11]

It is suggested that interproximal caries in these teeth ought to be dealt with minimalistically by disking the interproximal surfaces to open the contact between the teeth.^[12] In terribly carious teeth caries ought to be captured with the guide of GICs if conceivable; in any case, extraction ought to be the choice. Another option is to utilize the maxillary horizontal incisor strip crowns.^[13] In some European nations, composites or GICs are the material of decision in essential teeth in view of the dubious parts of dental mixture and its supposed antagonistic well-being impacts.^[14] Thus, despite the fact that the blend has been utilized for longer than a century and has appeared to perform well in negligible cavities.

Our research and knowledge have resulted in high-quality publications from our team.^[15-29] Hence, the main aim of this study was to investigate the choice of restorative materials in Class III dental caries in primary maxillary lateral incisors in 3–6-year-old children.

MATERIALS AND METHODS

The retrospective study was conducted in a Private Dental College, in Chennai, India. Ethical approval was obtained from the Institutional Review Board of the College (IHEC/SDC/PEDO/21/169).

Data collected from the records of the children 3–6 years of age for the choice of restorative materials of primary maxillary lateral incisors between September 2020 and February 2021 were included in the study. Children with Class III caries in primary maxillary incisors were included in the study. The tooth with Class III caries with pulp involvement was excluded from the study. One hundred and sixty-six teeth met the inclusion criteria and were included in the study. Data were collected under the following parameters age, gender, and choice of restorative materials.

Statistical analysis

Data were collected and compiled from the records of the children 3 to 6 years of age groups and were analyzed using the SPSS software (IBM Corp. Released 2016. IBM SPSS Statistics for Windows, Version 24.0. Armonk, NY: IBM Corp.). Data analysis was carried out using the Chi-square test. *P* value was set as <0.05.

RESULTS

Demographic characteristics are represented in Figure 1. It depicts the age-based distribution within the age group of 3–6 years. There was a 4% higher number of 5–6-year-old subjects in comparison with the participants in the age group 3–4 years.

Gender-based demographic distribution is depicted in Figure 2. It represents double the proportion of males (64.88%) compared to females (35.12%) in the population under consideration.

Variation in the percentage of children who underwent restoration utilizing strip crowns was the highest in the age group of 3–4 years (38.26%) when compared to light composite restorations (LCR) (14.9%), whereas the least preferred restoration was glass-ionomer cement (5.37%) which was noted statistically significant. On considering the age group of 5–6 years preferred form of restoration was LCR (19.80%) when compared to strip crown (17.79%), whereas 4.70% of the treatment cases were utilized for glass-ionomer cement restorations [Figure 3]. *P* = 0. Hence, it is statistically significant.

Gender-based description of the preferred restorative management was noted to be strip crowns among males (33.89%) and females (21.81%). Similarly, variation was noted among the genders, where double the proportion of males (20.47%) and females (13.37%) were given LCR. $P = 0.07$. Hence, statistically not significant [Figure 4].

DISCUSSION

Various studies have compared the choice of restorative materials with parameters such as age and gender. In the present study, results showed that the choice of restorative materials used in Class III dental caries was strip crowns. In 3–4-year-old children, the predominance of strip crowns was associated with 38.26%, respectively. In 5–6-year-old children, the predominance of LCR is associated with

19.80%, respectively.^[30] The similar findings of the study were similar to the study published by this article, in which 3–4-year-old children are more evident.^[31]

On the contrary, studies have shown that the LCR is more prevalently used choice of restorative materials in Class III dental caries and a few examinations have reported that the pervasiveness of these restorative materials has increased during the previous few decades.^[32] However, another cross-sectional study was conducted among 500 children of the age group of 3–10 years and concluded a statistically significant difference in the pattern of distribution of choice of restorative materials in Class III dental caries between age and also between the genders.^[33]

A similar study was conducted over preschool children in Gambia with a sample size of 300 where the results show no

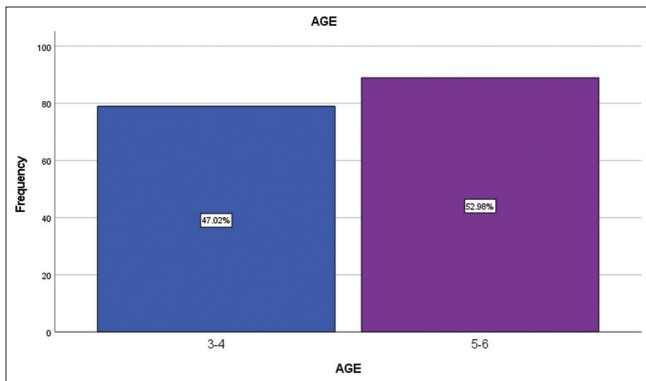


Figure 1: Frequency distribution of age group of 3–6 years old. The X-axis represents the age group of 3–6 years old and the Y-axis represents the frequency distribution

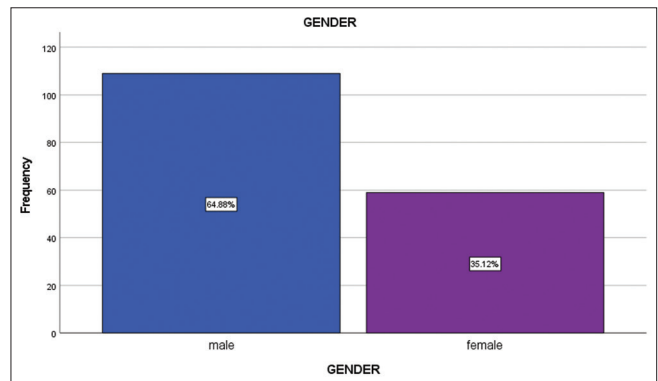


Figure 2: Frequency distribution of gender. The X-axis represents the gender and the Y-axis represents the frequency distribution

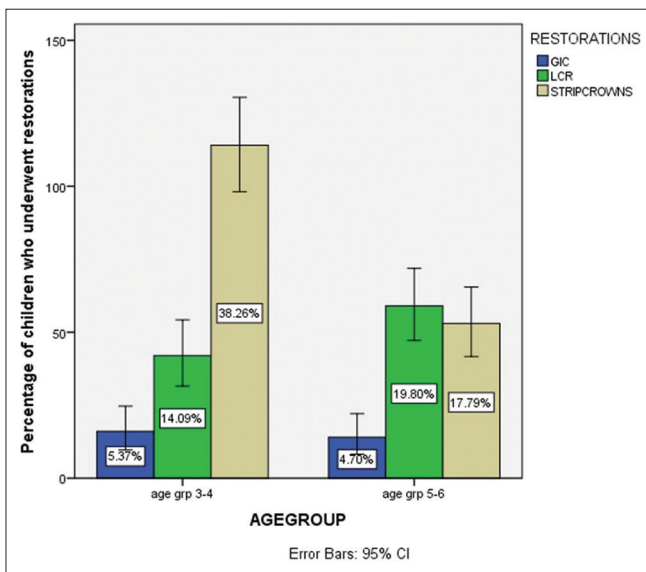


Figure 3: Association between the age of children and percentage of children who underwent restorations. The X-axis represents the age of the children and the Y-axis represents the percentage of children who underwent restorations. GIC: Glass-ionomer cement, LCR: Light composite restorations

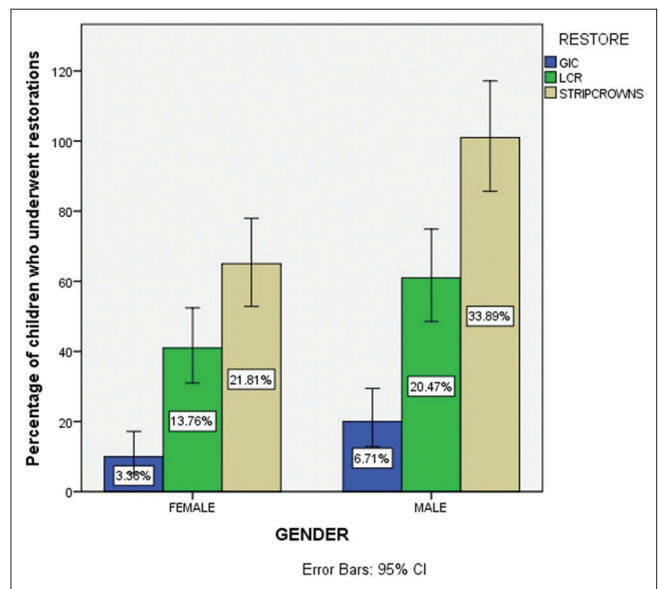


Figure 4: Association between gender of children and percentage of children who underwent restorations. The X-axis represents the gender of children and the Y-axis represents the percentage of children who underwent restorations. GIC: Glass-ionomer cement, LCR: Light composite restorations

statistically significant difference in the choice of restorative materials in Class III dental caries.^[34] The related trends with the choice of restorative materials were more prevalent in the 5–6 years age group with an increase in age.

Data have shown that there is a choice of restorative materials and more risk in acquiring the choice of restorative materials in Class III dental caries so proper preventive measures must be practiced to reduce the risk of getting dental caries.

Limitations

The study was limited to the South Indian population and is unicentric and limited to small sample size. The association of choice of restorative material to the pathological condition should be investigated in further studies to broaden the knowledge on the selection of restorative materials in Class III dental caries.

CONCLUSION

Within the limitations of the study, it was determined that the strip crowns are a more predominantly used choice of restorative material in Class III dental caries in primary maxillary lateral incisors in between 3- and 6-year-old children and there is a statistically significant difference in the choice of restorative material.

Acknowledgment

The author would like to acknowledge the help and support rendered by Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Science, and Saveetha University, Chennai.

Financial support and sponsorship

The present study was supported by the following agencies:

- Saveetha Institute of Medical and Technical Science
- Saveetha Dental College and Hospitals
- Saveetha University
- Ganga Devi Transports, Madhavaram, Chennai.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Croll TP, Bar-Zion Y, Segura A, Donly KJ. Clinical performance of resin-modified glass ionomer cement restorations in primary teeth. A retrospective evaluation. *J Am Dent Assoc* 2001;132:1110-6.
2. Diagnosis and Management of Dental Caries. Department of Health and Human Services Agency Earch and Quality; 2001. Available from: https://books.google.com/books/about/Diagnosis_and_Management_of_Dental_Carie.html?hl=&id=vdshAQAAMAAJ. [Last accessed on 2022 Aug 01].
3. American Academy of Pediatric Dentistry. The Reference Manual of Pediatric Dentistry; 2019. Available from: https://books.google.com/books/about/The_Reference_Manual_of_Pediatric_Dentis.html?hl=&id=1JrTywEACAAJ. [Last accessed on 2022 Jul 27].
4. Horowitz HS. Research issues in early childhood caries. *Community Dent Oral Epidemiol* 1998;26:67-81.
5. Johnsen DC. Response to Horowitz: Research issues in early childhood caries. *Community Dent Oral Epidemiol* 1998;26:82-3.
6. Hazen EP, McDougale CJ. The Massachusetts General Hospital Guide to Medical Care in Patients with Autism Spectrum Disorder. Newyork Hoboke: Springer; 2018. Available from: <https://play.google.com/store/books/details?id=hNSBDwAAQBAJ>. [Last accessed on 2022 Jul 22].
7. Fleming GJ, Burke FJ, Watson DJ, Owen FJ. Materials for restoration of primary teeth: 1. Conventional materials and early glass ionomers. *Dent Update* 2001;28:486-91.
8. Burke FJ, Fleming GJ, Owen FJ, Watson DJ. Materials for restoration of primary teeth: 2. Glass ionomer derivatives and compomers. *Dent Update* 2002;29:10-4, 16-7.
9. Pekkan G, Ozcan M. Radiopacity of different resin-based and conventional luting cements compared to human and bovine teeth. *Dent Mater J* 2012;31:68-75.
10. Koch G, Poulsen S, Espelid I, Haubek D. Pediatric Dentistry: A Clinical Approach. New Jersey, U.S: John Wiley & Sons; 2017. Available from: https://books.google.com/books/about/Pediatric_Dentistry.html?hl=&id=lxFSDQAAQBAJ. [Last accessed on 2022 Jul 22].
11. Donly KJ. Conservative glass ionomer cement occlusal restorations can be as effective as conventional amalgam occlusal restorations. *J Evid Based Dent Pract* 2011;11:52-3.
12. Watson T. Compomer versus glass ionomer restorations: Which material performs better in primary molars? *Br Dent J* 2000;189:85.
13. Dunne SM. Reinforced glass ionomer restorations. *Br Dent J* 2007;203:40-1.
14. van Dijken JW, Kieri C, Carlén M. Longevity of extensive class II open-sandwich restorations with a resin-modified glass-ionomer cement. *J Dent Res* 1999;78:1319-25.
15. Chen F, Tang Y, Sun Y, Veeraraghavan VP, Mohan SK, Cui C. 6-shogaol, a active constituents of ginger prevents UVB radiation mediated inflammation and oxidative stress through modulating NrF2 signaling in human epidermal keratinocytes (HaCaT cells). *J Photochem Photobiol B* 2019;197:111518.
16. Murugan MA, Arul Murugan M, Jayaseelan V, Jayabalakrishnan D, Maridurai T, Selva Kumar S, et al. Low velocity impact and mechanical behaviour of shot blasted SiC wire-mesh and silane-treated aloevera/hemp/flax-reinforced SiC whisker modified epoxy resin composites. *Silicon* 2020;12:1847-56.
17. Rajagopal R, Padmanabhan S, Gnanamani J. A comparison of shear bond strength and debonding characteristics of conventional, moisture-insensitive, and self-etching primers *in vitro*. *Angle Orthod* 2004;74:264-8.
18. Muthukrishnan S, Krishnaswamy H, Thanikodi S, Sundaresan D, Venkatraman V. Support vector machine for modelling and simulation of heat exchangers. *Therm Sci* 2020;24:499-503.
19. Ezhilarasan D. Oxidative stress is bane in chronic liver diseases: Clinical and experimental perspective. *Arab J Gastroenterol* 2018;19:56-64.
20. Neelakantan P, Sharma S, Shemesh H, Wesselink PR. Influence of irrigation sequence on the adhesion of root canal sealers to dentin: A fourier transform infrared spectroscopy and push-out bond strength analysis. *J Endod* 2015;41:1108-11.
21. Jose J, Palanivelu A, Subbaiyan H. Different treatment modalities followed by dental practitioners for Ellis class 2 fracture – A questionnaire-based survey. *Open Dent J* 2020;14:59-65.
22. Sahu D, Kannan GM, Vijayaraghavan R. Carbon black particle exhibits size dependent toxicity in human monocytes. *Int J Inflamm* 2014;2014:827019.

23. Nandhini NT, Rajeshkumar S, Mythili S. The possible mechanism of eco-friendly synthesized nanoparticles on hazardous dyes degradation. *Biocatal Agric Biotechnol* 2019;19:101138.
24. Wu F, Zhu J, Li G, Wang J, Veeraraghavan VP, Krishna Mohan S, *et al.* Biologically synthesized green gold nanoparticles from Siberian ginseng induce growth-inhibitory effect on melanoma cells (B16). *Artif Cells Nanomed Biotechnol* 2019;47:3297-305.
25. Patil SB, Durairaj D, Suresh Kumar G, Karthikeyan D, Pradeep D. Comparison of extended nasolabial flap versus buccal fat pad graft in the surgical management of oral submucous fibrosis: A prospective pilot study. *J Maxillofac Oral Surg* 2017;16:312-21.
26. Uthrakumar R, Vesta C, Raj CJ, Krishnan S, Das SJ. Bulk crystal growth and characterization of non-linear optical bithiourea zinc chloride single crystal by unidirectional growth method. *Curr Appl Phys* 2010;10:548-52.
27. Vijayakumar Jain S, Muthusekhar MR, Baig MF, Senthilnathan P, Loganathan S, Abdul Wahab PU, *et al.* Evaluation of three-dimensional changes in pharyngeal airway following isolated lefort one osteotomy for the correction of vertical maxillary excess: A prospective study. *J Maxillofac Oral Surg* 2019;18:139-46.
28. Vishnu Prasad S, Kumar M, Ramakrishnan M, Ravikumar D. Report on oral health status and treatment needs of 5-15 years old children with sensory deficits in Chennai, India. *Spec Care Dent* 2018;38:58-9.
29. Eapen BV, Baig MF, Avinash S. An assessment of the incidence of prolonged postoperative bleeding after dental extraction among patients on uninterrupted low dose aspirin therapy and to evaluate the need to stop such medication prior to dental extractions. *J Maxillofac Oral Surg* 2017;16:48-52.
30. Jongsma LA, Kleverlaan CJ, Feilzer AJ. Clinical success and survival of indirect resin composite crowns: Results of a 3-year prospective study. *J Prosthet Dent* 2012;108:343.
31. Jongsma LA, Kleverlaan CJ, Feilzer AJ. Clinical success and survival of indirect resin composite crowns: Results of a 3-year prospective study. *Dent Mater* 2012;28:952-60.
32. Muthu MS, Vignesh KC, Kandaswamy E. A comparative evaluation of fracture toughness of composite resin vs. protemp 4 for use in strip crowns: An *in vitro* study. *Int J Clin Pediatr Dent* 2020;13:57-60.
33. Ram D, Fuks AB. Clinical performance of resin-bonded composite strip crowns in primary incisors: A retrospective study. *Int J Paediatr Dent* 2006;16:49-54.
34. LeSage B. Direct composite resin layering techniques for creating lifelike CAD/CAM-fabricated composite resin veneers and crowns. *J Prosthet Dent* 2014;112:5-8.