

Critically Appraised Topic (CAT)

Project Team:
3B-1
Project Team Participants:
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Clinical Question:
What is the success of using glass ionomers to resolve tooth abfraction sensitivity compared with tooth desensitizing agents?
PICO Format:
P:
Geriatric patients with sensitive tooth abfractions
I:
Glass ionomer restorative material
C:
Desensitizing agents
O:
Decreased sensitivity
PICO Formatted Question:
In geriatric patients with tooth abfractions, are glass ionomers superior at resolving sensitivity compared to other desensitizing agents?
Clinical Bottom Line:
The research suggests that glass ionomers can be used as an effective treatment to help reduce dentin hypersensitivity in patients with tooth abfractions. The research also shows that other desensitizing agents can be viable alternatives to treating dentin hypersensitivity, as well.
Date(s) of Search:
October 29-November 2
Database(s) Used:
PubMed
Search Strategy/Keywords:
Glass ionomer, dentin, sensitivity, hypersensitivity
MESH terms used:
Glass ionomer, dentin, sensitivity, cervical
Article(s) Cited:
Article 1: Evaluation of dentin hypersensitivity treatment with glass ionomer cements: A randomized clinical trial. <ul style="list-style-type: none"> ■ Citation: Madruga MM, Silva AF, Rosa WL, Piva E, Lund RG. Braz Oral Res. 2017 Jan 5;31:e3. doi: 10.1590/1807-3107BOR-2017.vol31.0003. PMID: 28076496.

<p>Article 2: Desensitizing toothpaste <i>versus</i> placebo for dentin hypersensitivity: a systematic review and meta-analysis</p> <ul style="list-style-type: none"> ■ Bae JH, Kim YK, Myung SK. J Clin Periodontol. 2015 Feb;42(2):131-41. doi: 10.1111/jcpe.12347. Epub 2015 Jan 9. PMID: 25483802. <p>Article 3: Comparative evaluation of calcium phosphate-based varnish and resin-modified glass ionomer-based varnish in reducing dentinal hypersensitivity: A randomized controlled clinical trial.</p> <ul style="list-style-type: none"> ■ Sharma H, Gupta C, Thakur S, Srivastava S. Eur J Dent. 2017 Oct-Dec;11(4):491-495. doi: 10.4103/ejd.ejd_127_17. PMID: 29279676; PMCID: PMC5727735.
Study Design(s):
<p>Article 1: Randomized Clinical Trial</p> <p>Article 2: Systematic Review and Meta-Analysis</p> <p>Article 3: Randomized controlled clinical trial</p>
Reason for Article Selection:
<p>Article 1: It was applicable to our patient because glass ionomer restorative material is an option for treatment. And it showed that it was effective at decreasing tooth sensitization of dentin in non-carious cervical lesions</p> <p>Article 2: The reason this research article was selected was because it gave insight into the success of desensitizing agents. It showed that they could be suitable alternatives for treating dentin hypersensitivity in geriatric patients with abfractions present.</p> <p>Article 3: The reason this research was selected is because it compared a resin modified glass ionomer to another tooth desensitizing option, which could serve as a suitable alternative.</p>
Article(s) Synopsis:
<p>Article 1: The research was focused on 20 subjects aged 20-63 years old (mean age: 42.7 ± 13.2 years) that were sorted into two groups that used different types of resin modified glass ionomer cements. 152 teeth total were affected by dentin hypersensitivity. The first group used Clinpro™ XT (70 teeth) and the second group used Vidrion R (82 teeth). Teeth were reevaluated after placement with a tactile and air blast following treatment with resin modified GIC. They waited 20 minutes, 1 week, 2 week, 3 weeks, 1 month, 3 months, and 6 months after application to test the teeth. No subjects were lost during the experiments.</p>

- Most teeth tested were maxillary or mandibular premolars (42.8%), followed by molars, incisors, and canines (20.4%, 19.1%, and 17.8%, respectively).
- The goal for both groups was to decrease long-term dentin hypersensitivity.
- Results: During testing at the 6 month follow-up, both groups had less sensitivity when subjected to the tactile and air tests. There was a survival rate of 78.6% over a 5-year follow-up for Class V placements.
- Conclusions: Both glass ionomer cements proved effective in reducing hypersensitivity.
- Limitations: The subjects had a wide age range from 20-63 years old, would have been preferable if they were 65 years and older.

Article 2: This study aimed to investigate the effect of potassium-, stannous fluoride-, potassium and stannous fluoride-, strontium-, calcium sodium phosphosilicate-, and arginine-containing desensitizing toothpaste compared to placebo to treat dentin hypersensitivity. Results were recorded by using air blast test scores in adult patients suffering from dentin hypersensitivity.

- 31 randomized control trials that featured 2436 participants, with 1213 making up the intervention group and 1223 in the control group. Follow-up times ranged from 3 days to 12 weeks.
- Results: All of the toothpastes besides the strontium-containing toothpaste had favorable results (99% statistical power) after the groups were tested with air blasting and tactile sensitivity at follow-ups.
- Conclusions: Compared to the placebo, potassium-, stannous fluoride-, potassium and stannous fluoride-, calcium sodium phosphosilicate-, and arginine-containing toothpaste were deemed effective agents to decrease dentin hypersensitivity, which is a common complication of tooth abfractions.
- Limitations: the age ranges across the 31 randomized control trials were consistently around 18-70. An emphasis on an older demographic would have improved this study for our clinical question.

Article 3: The subject pool was selected by finding patients that had dentin hypersensitivity that was caused by cervical abrasion. The age range was from 18-50 years old. Final sample size was 24 subjects split into two groups; one with MI Varnish, another with Clinpro XT Varnish. Sensitive teeth were tested initially with ice cold water and air blasting. Reactions were based on a 1-10 scale with 10 being the "worst pain possible." After application of the varnishes, a 1 week follow-up test was repeated.

- Results: The group with MI Varnish had a statistically significant advantage over the Clinpro XT Varnish group when it came to reducing dentin hypersensitivity at the 1 week follow-up. The mean values of the pain scale for both the ice cold water test

<p>(0.4 vs 2.2) and air blast test (0.2 vs 2.2) were lower in the MI Varnish group, meaning less pain.</p> <ul style="list-style-type: none"> ■ Conclusion: Both types of varnishes helped reduce dentin hypersensitivity. However, MI Varnish was more effective in doing so when compared with Clinpro XT Varnish. ■ Limitations: There was only 24 subjects, and the age range was 18-50 years old. A larger subject pool as well as increased age range would have been beneficial for our question.
<p>Levels of Evidence: (For Therapy/Prevention, Etiology/Harm) See http://www.cebm.net/index.aspx?o=1025</p> <p><input checked="" type="checkbox"/> 1a – Clinical Practice Guideline, Meta-Analysis, Systematic Review of Randomized Control Trials (RCTs)</p> <p><input checked="" type="checkbox"/> 1b – Individual RCT</p> <p><input type="checkbox"/> 2a – Systematic Review of Cohort Studies</p> <p><input type="checkbox"/> 2b – Individual Cohort Study</p> <p><input type="checkbox"/> 3 – Cross-sectional Studies, Ecologic Studies, “Outcomes” Research</p> <p><input type="checkbox"/> 4a – Systematic Review of Case Control Studies</p> <p><input type="checkbox"/> 4b – Individual Case Control Study</p> <p><input type="checkbox"/> 5 – Case Series, Case Reports</p> <p><input type="checkbox"/> 6 – Expert Opinion without explicit critical appraisal, Narrative Review</p> <p><input type="checkbox"/> 7 – Animal Research</p> <p><input type="checkbox"/> 8 – In Vitro Research</p>
<p>Strength of Recommendation Taxonomy (SORT) For Guidelines and Systematic Reviews See article J Evid Base Dent Pract 2007;147-150</p> <p><input checked="" type="checkbox"/> A – Consistent, good quality patient oriented evidence</p> <p><input type="checkbox"/> B – Inconsistent or limited quality patient oriented evidence</p> <p><input type="checkbox"/> C – Consensus, disease oriented evidence, usual practice, expert opinion, or case series for studies of diagnosis, treatment, prevention, or screening</p>
<p>Conclusion(s):</p> <p>This evidence applies to the patient because it compares glass ionomers to other desensitizing agents in their efficacy to reducing dentinal hypersensitivity. Although the research articles were not specific to geriatric patients, there were still some geriatric subjects in the studies. However, tooth abfractions and non carious cervical lesions were tested in these studies, and these relate to our patient.</p> <p>I would advise my D4 to consider using resin modified glass ionomers, as they are a suitable alternative to other desensitizing agents and are effective in</p>

reducing dentinal hypersensitivity. However, there is evidence that some desensitizing agents are more efficient than glass ionomers.