Dental Whitening and Tooth Sensitivity

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INTRODUCTION

- Achieving a bright, perfect smile has become a priority to many patients seeking dental care. Cosmetic techniques and products targeting teeth whitening are in the rise among dental products. However, bleaching products have been proven to cause teeth sensitivity.

RESEARCH PARAMETERS

- PubMed and ScienceDirect were used in the research.
- Parameters were dental hypersensitivity, Hydrogen Peroxide, Carbamide Peroxide, tooth bleaching, dental whitening, and LED.
- Six Randomized Control Trials and two Systematic Reviews were analyzed.

TYPICAL WHITENING METHODS

- Hydrogen Peroxide (HP) 15-38%
- Carbamide Peroxide (CP) 10-44%
- Light-Emitting Diode (LED) Adjunct

INCLUSION CRITERIA

- No carious lesions
- No intrinsic staining
- Non-smokers
- No systemic diseases
- No pregnant or lactating mother
- No teeth sensitivity
- Teeth that haven't been whitened before
- In vitro vs In vivo samples
- Shade A3 or higher

RESULTS/DISCUSSION

Concentration

- The lower the concentration of HP, the patient experienced less hypersensitivity
- The concentration of CP did not indicate substantial results in hypersensitivity

Amount of Exposure

- The lower the time of exposure with HP, the patient experienced less hypersensitivity
- The amount of exposure CP did not indicate substantial results in hypersensitivity

Whitening Results

- The ratio of HP compared to CP is 3:1
- Independently of the concentration, hydrogen peroxide achieved the same whitening results as the carbamide peroxide

CONCLUSIONS

- The use of CP and HP with or without LED application causes some level of hypersensitivity.
- In-office and at-home dental whitening techniques allows patients to achieve their cosmetic goals of a brighter smile.
- In-office procedures causes a slightly higher level of hypersensitivity due to the higher concentration of CP and HP compared to the at-home whitening application.
- At-home whitening technique is available at a lower HP and CP concentrations, the whole process takes longer, but it causes less tooth sensitivity.
- LED use in conjunction with CP and HP may accelerate the whitening process, it might also be the reason for higher sensitivity because of changes in the pulp chamber.
- Overall, more research is needed to have a better understanding of the correlation between new whitening techniques and dental hypersensitivity.

FUTURE IN DENTAL HYGIENE

- Dental hygienist need to be aware of different whitening technologies in the market.
- Hypersensitivity is a subject that always need to be addressed with the patient prior to any bleaching procedure.
- It is important for the dental provider to keep updated with evidence based research for all different bleaching technologies.
- Recent evidence based research has shown that using applied voltage across two electrodes (+ and -) with a HP gel in between drives the pH change in the gel and accelerates the peroxide ability to bleach stains.
- Adding heat through light to the HP/CP accelerates oxidation but also increases hypersensitivity.
- While electrochemistry technology accelerates the oxidation process, research has not shown any hypersensitivity effects.

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