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DENTIN HYPERSENSITIVITY

Toothpastes to manage hypersensitivity

BACKGROUND

Dentin hypersensitivity (DH) refers to sensitivity of the teeth to external stimuli such as cold, heat, acid, sweetness, friction, and various other mechanical actions. The pain occurs rapidly, is sharp, and lasts for a short time. This symptom is seen in several dental disorders and has a negative effect on patients' health-related quality of life. The pathogenesis proposed for DH includes nerve fiber conduction, dentin fiber conduction, dentin tubule lymphatic conduction, and hydrodynamic changes. The last is most widely accepted at this time. Treatment consists of sodium fluoride protective varnish, Gluma desensitizing agent, resin desensitization agent, laser desensitization, and desensitizing toothpaste, with the toothpaste having the advantages of being convenient, noninvasive, and inexpensive. Some systematic reviews and meta-analyses question the efficacy of toothpastes that contain potassium, strontium, stannous fluoride, arginine, or sodium calcium phosphosilicate for DH. A review of the literature was done to determine if there is sufficient evidence to support the use of desensitizing toothpastes compared to negative controls.

METHODS

The literature was collected from the PubMed, EMBASE, Web of Science, CENTRAL, and Chinese Biomedical Literature databases up to November 27, 2017. Fifty-three randomized controlled clinical trials were selected, covering 4796 participants, with 240 of them being negative control groups. The toothpastes tested included those containing potassium (18 studies), arginine (13 studies), stannous fluoride (9 studies), strontium (7 studies), calcium sodium phosphosilicate (6 studies), potassium and strontium (3 studies), potassium and stannous fluoride (3 studies), nanohydroxyapatite (2 studies), and amorphous calcium phosphate (2 studies). The efficacy of the toothpastes was measured against negative controls based on air-blast test scores.

RESULTS

Most (44) of the studies demonstrated a moderate risk of bias, with 3 at low risk and 6 at high risk. The evidence regarding amorphous calcium phosphate–containing toothpaste was of very low quality, whereas that on strontium-, potassium and strontium–, and potassium and stannous fluoride–containing toothpastes was of low quality. Moderate quality evidence was found regarding the other toothpastes.

All of the toothpastes containing active desensitization ingredients except strontium and amorphous calcium phosphate achieved better desensitization in DH than the negative controls.

DISCUSSION

DH can profoundly affect the quality of life of patients. Compared to negative control groups, better relief of DH was obtained using potassium-, stannous fluoride–, potassium and strontium–, potassium and stannous fluoride–, calcium sodium phosphosilicate–, arginine-, and nanohydroxyapatite-containing toothpastes. Toothpastes containing strontium or amorphous calcium phosphate are not believed to be as effective as the other toothpastes or as the negative controls.

Clinical Significance

Many studies of toothpastes that claim to provide relief from DH are funded by companies, and some researchers are employees of these companies. These facts must be considered as having a major impact on the results and publication of these articles. Future studies should be of high quality and funded by non-company sources. It is hoped that the results and conclusions of these future studies will more accurately reflect the effects of desensitizing toothpastes.

Hu M-L, Zheng G, Zhang Y-D, et al: Effect of desensitizing toothpastes on dentine hypersensitivity: A systematic review and meta-analysis. *J Dent* 75:12-21, 2018

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