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CLINICAL EFFICACY OF TOOTHPASTE CONSISTS OF POTASSIUM NITRATE IN DENTINAL HYPERSENSITIVITY

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INTRODUCTION

Dentinal hypersensitivity is defined as short sharp pain arising from exposed dentin response to stimuli typically thermal osmotic chemical evaporative tactile and other form of dental defects or disease [1]. After other possible conditions have been eliminated like chipped or fracture teeth, cracked cusps, carious lesions, Leaky restorations and palate-gingival groves, dentinal hypersensitivity usually is diagnosed. According to some reports its prevalence has been 25% to 48% in Adult population in India. Canines and premolars are more prone to become hypersensitive. In dentinal hypersensitivity,

microscopic examination has revealed that dentinal tubules are wider and numerous [2-4].

In addition to mimic the patient's complaint or symptoms, in a visual inspection it is essential to evoke or induce the characteristic transient sharp pain by applying a stimulus to the affected tooth. Stimulus which may evoke dental hypersensitivity is usually mild and generally not expected to cause the pain in healthy teeth [5]. According to patient's complaint after diagnosis can be confirmed if the outcome of the test applied on the patient is a transient sharp pain which makes the patient's complaint, stimulus

like thermal, tactile, mechanical can be applied to the dentin exposure.

To differentiate the diagnosis from reversible and Irreversible pulpitis, based on the pain hot and cold stimulus can also be applied. Some defects like occlusal and dental trauma or cracked tooth can also evoked dentinal hypersensitivity like pain after occlusal forces or by vertical percussion. Pain from all the above mentioned causes can also be distinguished by instructing a patient to bite and roll over a cotton palette from dentinal hypersensitivity. Cracks and some other defects can also be observed by trans illumination and optical magnification with visualization. Diagnosis of dentinal hypersensitivity with radiographic examination is of limited value to confirm. But it is required to confirm other pathological conditions such as caries, Fracture, defective restorations or other dent alveolar lesions, that might cause pain.

Treatment approach of dental hypersensitivity is aimed to reduce excitability of nerve fibers within the pulp or the open dentinal tubules. There are various therapies and agents are being used to eliminate hypersensitivity of dentin. Agents which can be used as desensitizer are Silver Nitrate, fluoride, formaldehyde and potassium nitrate, in which potassium nitrate is one of the most common and preferred agent used in management of dentinal hypersensitivity [6, 7].

Potassium salts (nitrate and chloride) reaches the pulp in just few minutes. It releases relatively small size of the ions which act quickly enough

to move into the dentinal tubules^{8,9,10} Tooth paste (dentifrices), containing potassium ions have been shown to be effective in reducing the dentin hypersensitivity and use dentifrices containing 5% potassium nitrate of has been recommended by American Dental Association council on dental therapeutics (Council of dental therapeutics 1986). Potassium ions are thought to act by blocking the action potential generated in intra-dental nerves. Studies have shown that potassium in dentinal desensitizing preparations act directly on intra-dental nerves by raising concentration of potassium in the extracellular fluid around dental nerves adequately to prevent action potential generation throw axonal accommodation.

Clinical study:-

Objective

A study was conducted with 5% potassium nitrate containing desensitizing toothpaste to evaluate the effectiveness for the treatment of dentinal hypersensitivity.

Inclusion criteria

Desensitizing agents containing 5% potassium nitrate, sodium chloride, xylitol and triclosan were given to 15 patients with dental hypersensitivity.

Exclusion criteria

History of treatment for dentinal hypersensitivity.
History of orthodontic treatment. History of prosthetic treatment like ground bridges etc.
History of trees or Restoration in hypersensitive area.
Poor periodontol condition.

Systematic debilitating disease.

Cervical abrasion, fracture tooth attrition etc.

MATERIAL AND METHODS

After written consent was taken all patients were provided detailed information about the study self applied to paste were given to the patients to be used twice daily patients were instructed to brush with allocated toothpaste for 2 to 3 minute and advised to use toothpaste only in sensitive areas, after 2 weeks follow-up was done. To evaluate dentinal sensitivity, a follow-up was done after 4 week, which was recorded though VAS (visual analogue scale) after assessing stimulus and thermal stimulus on the effect tooth. SPSS (statistical Package, Statistical program for social science) was used to calculate result and $p < 0.05$ was considered to be significant.

RESULTS

In response to a stimulus baseline mean be a score 6.3 ± 2.7 and In response to thermal

stimulus it is 7.2 ± 1.2 all VAS score was significantly lower to both stimulus after using the 5% Potassium Nitrate Desensitizing agent.

At the end of 4th week VAS score to air stimulus (VAS-A) reduced from 6.6 ± 2.7 at baseline to 2.3 ± 1.3 . ($p < 0.001$) and VAS score to thermal stimulus (cold water VAS-C) was reduced from 7.2 ± 1.2 at baseline to 2.6 ± 1.0 at end of 4th week.

The results show that desensitizing toothpaste containing 5% potassium nitrate is found to be significantly effective in reducing sensitivity within 4 week evaluation period.

The VAS score in response to air stimulation and to thermal stimulation demonstrated a significant difference in sensitivity isko over four week. This demonstration of effectiveness of toothpaste containing 5% potassium nitrate as effective desensitizing agents is in accordance with the various studies conducted in the past.

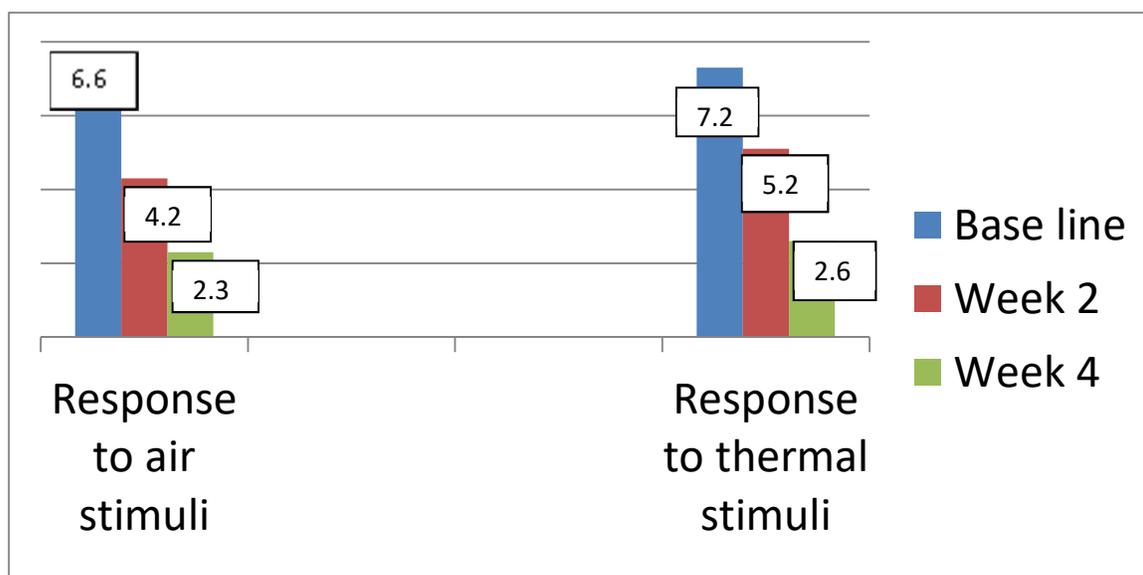


Figure 1: Mean VAS scores

Table 1: Mean VAS scores

	Base line	Week2	Week 4	P value
Air stimuli response	6.6	4.2	2.3	<0.001
Thermal stimuli response	7.2	5.2	2.6	<0.001

CONCLUSION

According to the results dentinal hypersensitivity in clinically significant clinically reduced over 4th week. and patients who were presented with complaint of dentinal hypersensitivity and later reported significant reduction of their symptom. Therefore 5% potassium nitrate toothpaste with brushing twice in a day may help to reduce dentinal hypersensitivity.

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