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Comparison of Herbal Mouthwash Hiora -K And Homeopathic Mouthwash Propolis In Management of Dentinal

## Hypersensitivity: A Double Blind Clinical Study

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**Conflicts of Interest:** Nil

## Abstract

**Aim:** To compare the efficacy of an herbal mouthwash (Hiora-K) and homeopathic mouthwash (propolis) in treating dentinal hypersensitivity.

**Materials and Methods:** Twenty patients were selected. Subjects were evaluated using two different stimuli i.e. air blast test and cold water test. A double blind study was carried out in which patients were randomly divided into two groups. Patients in group I were treated with herbal mouthwash (Hiora-K) and Patients in group II were treated with homeopathic mouthwash (Propolis).The patients were examined at baseline, 1 week, 2 week and 3 week interval. Statistical analysis was performed using unpaired 't' test.

**Results:** The results were analyzed, it was seen that patients treated in group I showed statistically better results compared to group II at 1 week, 2 week and 3 week interval.

**Conclusion:** Both the agents, Hiora-K and propolis mouthwash showed reduction in dentinal hypersensitivity. But the decrease in mean discomfort scores of Hiora k group was statistically significant as compared to Propolis group.

**Keywords:** Dentinal hypersensitivity, desensitizing agents, Hiora-K, Propolis.

## Introduction

Dentinal hypersensitivity is characterized by short sharp pain arising from exposed dentin in response to stimuli typically thermal, evaporative, tactile, osmotic or chemical and which cannot be ascribed to any other form of dental defect or pathology [1]. Dentinal sensitivity may occur due to gingival recession [2], loss of cementum or enamel wear. Enamel wear generally occur in the form of erosion which is the irreversible loss due to chemical dissolution by acids not of bacterial origin[3]. Most common causes are dietary acids in juices and citrus fruits or carbonated

drinks. Intrinsic acids can lead to erosion in diseases like anorexia nervosa, bulimia, and gastro-esophageal reflux disease. Abrasion, attrition and abfraction can also contribute to dentinal hypersensitivity. Other causes of dentinal hypersensitivity include poor oral hygiene, premature occlusal contact or sometimes periodontal therapy. Treatment of dentinal hypersensitivity can be self-administered or by a dental professional. Various desensitizing agents can be used in the form of dentifrices, gel, varnishes, dental adhesives or mouthwashes [4,5] Hiora-K mouthwash has desensitizing and mouth refreshing actions. Hiora K Mouthwash contains natural potassium that reduces tooth sensitivity from varied etiologies. It also has remineralizing, antimicrobial, antiseptic, analgesic activities. Hiora-K mouthwash protects teeth against common strains of bacteria which cause periodontitis leading to sensitive teeth. Propolis is a homeopathic mouthwash which can be used as desensitizing agen[6]. Propolis is a resinous mixture collected from trees by the Apis mellifera bee, which uses a building insulating material in the beehive as well as for keeping it in good health [7]. The main chemical classes present in propolis are flavonoids, phenolics and other various aromatic compounds. Flavonoids present in antibacterial, propolis have antifungal, antiviral. antioxidant and anti-inflammatory properties. Propolis interact with the dentin, thus forming crystals consequently, reduce dentin sensibility[8]. Thus the aim of present study was to compare the efficacy of an herbal mouthwash (Hiora-K) and homeopathic mouthwash (propolis) in treating dentinal hypersensitivity.

### **Materials and Method**

The patients were selected from the outpatient department of periodontics A.C.P.M. Dental College, Dhule.

## **Inclusion Criteria**

1. A total 174 teeth from 20 patients within age group of 18-55 years were included in the study.

2. Patients reporting sensitivity from hot, cold, sweet or sour or during brushing were included in the study.

### **Exclusion Criteria**

- Patients using desensitizing agents/ dentifrices Subjects with history of treatment for dentine hypersensitivity Poor periodontal condition Systemic debilitating disease.
- > Caries or restoration in the area of hypersensitivity.
- Allergy to the agents used in the study.
- Patients with orthodontic appliance, crowns, bridges in the area of hypersensitivity Patients taking antibiotics and anti-inflammatory drugs. Pregnant and lactating women.
- Patients who had undergone periodontal surgery within last months. All the patients received and signed the appropriate informed consent forms.

## Study participants were divided into two groups:

**Group I:** Comprised 87 teeth to be treated with herbal mouthwash (Hiora-K)

**Group II:** Comprised 87 teeth to be treated with homeopathic mouthwash (Propolis)

#### **Clinical Examination:**

Patients recruited for the study were evaluated using two test stimuli i.e. Air blast test and cold water test. The test site was isolated using cotton rolls and the stimuli were applied.

**Air Blast Test:** A blast of air from the dental syringe was applied onto the affected area of the tooth isolated with cotton rolls, for 1 second from a distance of 1cm.

**Cold Water Test:** Ice cold water was freshly melted within 1-2 minutes and then it was filled in pre-cooled 2 ml disposable syringe. After isolating the specific tooth, 0.2ml of this ice-cold water was slowly poured from the

syringe on to the suspected tooth surface. Both stimuli were applied at the interval of 5 minutes each at baseline, 1 week, 2 week and 3 week respectively.

The response of the patient was measured using 'Schiff scale'[9] from 0 to 3 on a numerical scale as under:

0=Patient does not respond to the stimulus/no pain

1=Patient responds to stimulus but does not request its discontinuation

2=Patient responds to stimulus and requests discontinuation/ moves away

3=Patient responds to stimulus, requests discontinuation and considered the stimulus to be painful.

## **Data Analysis**

Measurements used in present study included the mean change in discomfort score. The statistical analysis was performed using unpaired 't' test.

## Results

The mean discomfort score was compared using unpaired 't' test. The baseline values for Hiora K and Propolis were  $2.62\pm0.49$  and  $2.66\pm0.48$  respectively for air blast test. Whereas the baseline values for Hiora K and Propolis Table 1: Unpaired 't' test were  $2.70\pm0.46$  and  $2.69\pm0.47$  respectively for cold water test. It was seen that difference between Group I and Group II at baseline was not statistically significant.

The results showed decrease in mean discomfort scores as compared to baseline in 1 week, 2 week and 3 week intervals in both air blast test and cold water test. The mean discomfort score of air blast test decreased from baseline value  $2.62\pm0.49$  to 3 week value of  $0.16\pm0.37$  for Hiora-K and from baseline value  $2.66\pm0.48$  to 3 week value of  $1.41\pm0.67$  for propolis. The mean discomfort score of cold water test decreased from baseline value  $2.70\pm0.46$  to 3 week value of  $0.31\pm0.47$  for Hiora-K and from baseline value  $2.69\pm0.47$  to 3 week value of  $1.33\pm0.64$  for propolis as depicted in table I.

The decrease in mean discomfort scores of Hiora k group were statistically significant as compared to propolis group at 1 week, 2 week and 3 week intervals in both air blast test and cold water test. (Graph I and II)

Time	Air Blast Test MEAN±SD		T Value	P Value	Time	Cold Water Test MEAN±SD		t value	P value
	Hiora - K	Propolis	Value	value		Hiora - K	Propolis		, arac
Base Line	2.62±0.49	2.66±0.48	-0.471	0.638	BASE LINE	2.70±0.46	2.69±0.47	0.164	0.87
1 Week	1.28±0.76	2.31±0.47	- 10.851	0	1 Week	1.31±0.69	2.34±0.48	- 11.526	0
2 Week	0.59±0.69	1.87±0.33	- 15.637	0	2 Week	0.76±0.75	1.92±0.31	- 13.375	0
3 Week	0.16±0.37	1.41±0.67	- 15.197	0	3 Week	0.31±0.47	1.33±0.64	- 12.047	0

#### Discussion

Propolis is a yellowish brown, sticky, glue-like resinous substance that honeybees (Apis mellifera L.) collect from various plant species.[10] The term 'propolis' is derived from 'pro' (Greek = before), and 'polis' (city) or "defender of the city"[11]. It is believed to have been coined by Aristotle who identified how propolis was used to protect and defend the hive. Bees have been producing propolis almost since time began. They do it by collecting resin from trees and plants, taking it back to the hive where they work upon it, transforming it into the highly complex chemical mix. Propolis is sticky at and above room temperature. At lower temperatures, it becomes hard and brittle. There are said to be more than 180 different chemicals in propolis which vary according to the kind of bees collecting it, the climatic zone, the local trees and plants and even the time of the day it is collected[12] It is composed of resin and balsams (50 - 70%), essential oils and wax (30 - 50%), pollen (5 - 10%) and other constituents which are amino acids, minerals, vitamins A, B complex, E and the highly active bio-chemical substance known as bioflavenoid (Vitamin P), phenols and aromatic compounds[13]

Antibacterial property of Propolis is due to the presence of Flavanoids and aromatic compounds such as cafeic acid.[14] Propolis has found to be very effective against gram positive bacteria [15] especially against *Staphylococcus aureus*[16] and against gram negative bacteria, Salmonella.[17] Anti-inflammatory property of propolis is due to the presence of caffeic acid phenethyl ester (CAPE) in propolis[18] Propolis is shown to inhibit synthesis of prostaglandins, activate the thymus gland, aid the immune system by promoting phagocytic activity, stimulate cellular immunity, and augment healing effects on epithelial tissues. Ethanolic extract of propolis inhibits hyaluronidase activity. As this enzyme is responsible for several inflammatory processes, propolis holds a great potential as an anti-inflammatory agent[19]

Propolis has been said to control dentinal hypersensitivity by occluding the dentinal tubules[20] Hiora-K mouthwash helps in restoring the mineral composition of the teeth and strengthens them. Ingredients include Tulasi (*Ocimum sanctum*), Lavanga (*Syzygium aromaticum*), Jatiphala (*Myristica fragrans*), Misreya (*Foeniculum vulgare*), Peppermint satva (*Mentha spp.*), suryakshara (Potassium nitrate). **Clove** (*Lavanga*), contains anesthetic chemical compound, eugenol and naturally derived **Potassium nitrate** (*Suryakshara*) inhibit pain in hypersensitive teeth through its desensitizing effect on dentinal nerves.

In this study it was seen that the baseline values for Hiora K and Propolis were  $2.62\pm0.49$  and  $2.66\pm0.48$  respectively for air blast test. Whereas the baseline values for Hiora K and Propolis were  $2.70\pm0.46$  and  $2.69\pm0.47$  respectively for cold water test. It was seen that difference between Group I and Group II at baseline was not statistically significant.

Both the agents, Hiora-K and propolis mouthwash showed reduction in dentinal hypersensitivity from baseline to 3 week interval. But the decrease in mean discomfort scores of Hiora k group was statistically significant as compared to propolis group at 1 week, 2 week and 3 week intervals in both air blast test and cold water test.

At present no studies are available in the literature where Hiora k and Propolis mouthwash has been compared as a desensitizing agent.

A pioneer study was carried out by Mahmoud et al. on the effect of propolis on dentinal hypersensitivity *in vivo*. The hypersensitivity was assessed on a visual scale 0 - 10 and by slight, moderate and severe classification at baseline, after 1 and 4 weeks. Seventy percent of the subjects had severe hypersensitivity at the baseline. At first recall, 50% reported moderate hypersensitivity, 50% reported slight

hypersensitivity at second recall and 30% had no hypersensitivity while only 19% had moderate hypersensitivity. It was concluded that propolis had a dentinal positive effect in the control of hypersensitivity[21]

The SEM study was carried out in twenty-four recently extracted human premolar teeth by Almas K et al in which effect of propolis and saline application on human dentin was compared. All specimens were prepared for scanning electron microscopy (SEM) with sputter technique and examined in the SEM operated at 25 KV with a tilt angle between 0-30 degrees. They found that the propolis was better than saline in occluding dentinal tubules[22]

Within limitation of this study, Hiora-K mouthwash has shown better results than propolis mouthwash as desensitizing agent however a further long term study can be undertaken.

#### Conclusion

Both the agents, Hiora-K and propolis mouthwash showed reduction in dentinal hypersensitivity from baseline to 3 week interval. But the decrease in mean discomfort scores of Hiora k group was statistically significant as compared to propolis group at 1 week, 2 week and 3 week intervals in both air blast test and cold water test. Thus the efficacy of desensitizing agent Hiora-K mouthwash is more as compared to propolis mouthwash.

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#### **Legends Figure**

Figure 1: Air bast test



Figure 2: Cold water test



Figure 3: Compairson of mean discomfort score at difference time invervals cold water test between HIORA –K test and Propolis



Figure 4: Comparison of mean discomfort score at difference time invervals in air blast between HIORA –K test and Propolis

