

# **Clinical evaluation of a diamine silver fluoride/potassium iodide as a dentine desensitizing agent: 2-year follow up.**

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## **INTRODUCTION**

An original study was undertaken to compare the effectiveness of diamine silver fluoride followed by potassium iodide in treating dentine hypersensitivity compared with an oxalic acid - based proprietary product, designed for the same purpose. Results showed that, at 7 days, the silver fluoride/potassium iodide treatment was the more effective of the two.<sup>1</sup>

This study was carried out 2 years after the initial treatment, to assess tooth sensitivity and the status of the treated areas and the surrounding soft tissues.

## **METHODS**

### **Participants**

The 19 participants in the original study were contacted and asked to participate in the follow-up assessment.

### **Randomisation**

This study was conducted as a double blind randomised clinical trial. Assessments of sensitivity were made by one investigator who was unaware of the treatments originally assigned to test and control teeth.

Details of treatments and results were only released upon the completion of the sensitivity assessment at the end of the study.

### **Treatment agents**

The treatment agents were a silver fluoride/potassium iodide product (Riva Star - SDI Limited, Melbourne, Australia) which contains 38% (w/v) diamine silver fluoride and a saturated solution of potassium iodide and an oxalic acid-based product (SuperSeal - Phoenix Dental Inc, Fenton, MI, USA) which contains oxalic acid, potassium salt and water.

### **Procedure**

The patients were seated and recognized infection control guidelines for a dental examination followed. The teeth previously treated were identified by an independent observer. A cooling spray (Miracold Plus – Hagerwerken, Duisburg, Germany) was applied to a cotton bud and each nominated tooth received a 3-second application of the cold stimulus. The patient was asked to record his or her response on a visual analogue scale (VAS) graded from 1 to 10.

An assessment was made of the status of the tooth structure at the treatments sites and soft tissues adjacent to these sites. Clinical digital photographs of the previously treated teeth and gingivae were taken before the patient was dismissed.

## **Statistical analysis**

Analysis of the differences in VAS between 7 days and 2 years was performed using a paired samples t-test with the SAS Statistical Package (SAS Institute, Cary, NC, USA).

## **RESULTS**

Of the original 19 patients, 15 were available for examination but one had to be excluded because one of the previously treated teeth had been extracted.

Overall, there was a reduction in dentine hypersensitivity over the 2-year period. Of the 28 sites examined 2 showed a slight increase in VAS and two showed no change with the remainder showing a decrease in VAS.

Table 1 shows the mean VAS for treated teeth at 7 days and after 2 years and the mean difference in VAS between the two intervals. The mean difference between VAS at the two intervals for teeth treated with diamine silver fluoride/potassium iodide was -2.59 compared to -2.61 for teeth treated with the oxalic acid-based preparation. Table 2 shows that this difference was not statistically significant ( $p = 0.9853$ ).

Presented in Table 3 are the results of the clinical examination of the gingival tissues adjacent to the treatment sites and the tooth structure at the treatment sites. There were no observable changes in inflammation or other changes in the gingival tissues and no staining was observed on any of the teeth.

## **DISCUSSION**

In the 2-year period between assessments there was a general reduction in dentine hypersensitivity with 24 of the 28 treated sites recording lower VAS.

The quantitative data presented in Tables 1 and 2 show that, at 2 years, there was no significant difference in the sensitivity levels between teeth treated with silver fluoride/potassium iodide and those treated with the oxalic acid-based preparation. Furthermore, the data in Table 3 show that the gingival tissues adjacent to the treatment sites were healthy and there was no evidence of staining of tooth structure.

## **Reference**

1. Craig GG, Knight GM, McIntyre JM. Clinical evaluation of diamine silver fluoride/potassium iodide as a dentine desensitizing agent. A pilot study. *Aust Dent J.* 2012;57:308-311.

**Table 1**

The mean difference between VAS at 7 days and 2 years for teeth treated with diamine silver fluoride/potassium iodide and for teeth treated with the oxalic acid-based preparation.

	Treatment (no. of subjects = 14)			
	DSF/KI*		OA**	
	Mean VAS	SD	Mean VAS	SD
7 days	5.97	2.04	6.2	2.34
2 years	3.38	2.64	3.59	2.45
Change	-2.59	2.20	-2.61	2.28

\*DSF/KI = diamine silver fluoride/potassium iodide

\*\*OA = oxalic acid-based preparation

**Table 2**

Analysis of changes from 7 days to 2 years with silver diamine fluoride/potassium iodide treatment compared to oxalic acid – based treatment.

N	Mean difference	Standard error	Lower 95% CI	Upper 95% CI	DF	t value	p value
14	0.02	0.761	-1.66	1.63	13	0.02	0.9853

**Table 3**

Assessment of gingival condition adjacent to treatment sites and staining of tooth structure and soft tissues at/adjacent to treatment sites at 2 years.

Nature of treatment	No. of sites	Gingival condition (no. of sites)		Staining (no. of sites)	
		Healthy	Inflammation	Soft tissues	Tooth structure
DSF/KI*	14	14	0	0	0
OA **	14	14	0	0	0

\*DSF/KI = diamine silver fluoride/potassium iodide

\*\*OA = oxalic acid-based preparation