

Department of Virology, Skubiszewski Medical University of Lublin

MAŁGORZATA MAJEWSKA-PARADOWSKA

Green Or preparation in dentin hypersensitivity treatment

Dentin hypersensitivity is the term used to define a pain which is caused by unharmed sensory stimuli due to dentin exposure and dental tubule opening (4). Most often this is a short-lasting pain – occurring only during irritative stimulus action. Dentin hypersensitivity refers to: 1) clinically healthy teeth with exposed necks, 2) teeth, in which there were observed defects of non-carious origin (e.g. wedge defects, abrasions, erosions) and in gingivae and parodontium recession leading to root cement exposure (4, 5, 10, 11, 13). Dentin hypersensitivity within tooth necks was observed in 8–30% of the examined adult population.

The occurrence of the ailments described above was most frequently observed in the third decade of life (2, 3, 12). The hypersensitivity syndrome was more common for women than for men (12). The observed pain ailments are usually located in canine teeth, premolars, incisors and molar teeth. A lot of general and local factors predispose to the occurrence of dentin hypersensitivity. General factors comprise: states of nervous exhaustion, overstrain, pregnancy, convalescence periods (4, 7).

Dentin exposure results from the lack of covering enamel or cement. The loss of enamel occurs as the result of abrasion (caused by some habits), attrition (caused by chewing, bruxism) or erosion (connected with acid food or environment ingredients) (14, 12, 13). The additional factors are mechanical injuries connected with improper techniques of brushing teeth, toothbrush hardness, toothpaste abrasiveness. The important role is also played by abnormal occlusion powers (especially unbalanced lateral powers within tooth necks) (8, 13).

Among the dentin hypersensitivity factors there are also mentioned limited pulpitis which appears as the result of complications after tooth or parodontium treatment (tooth grinding), surgical operations on parodontium, (e. g. gingivectomy) (1, 9, 12).

The following methods which are used to eliminate hypersensitivity can be classified as physical, chemical and physico-chemical methods (9).

The purpose of this paper is clinical evaluation of Green Or preparation in the dentin hypersensitivity treatment.

MATERIAL AND METHODS

Green Or preparation is used to eliminate hypersensitivity by means of a chemical method. It consists of two solutions: solution no. 1 (green label) containing potassium salts and solution no. 2 (orange label) containing calcium and strontium salts. The mechanism of the preparation action is based on the double displacement reactions among potassium, calcium and strontium salts on the tooth surface. Crystalline complex created as the result of this reaction closes open dental tubules, and the potassium ions released into the dental tubules depolarize nerve fibres blocking their irritability. Closing of dental tubules prevents the displacement of dentin liquid which leads to suppressing the pain accompanying the hypersensitivity.

The Green Or preparation was applied in the treatment of hypersensitivity of 240 teeth in 30 patients, including 20 women and 10 men, aged 20–70, who were subjected to inquiry and clinical examinations.

The occurrence of pain ailments accompanying tooth brushing, type of a tooth-brush, frequency (Table 1) and techniques of hygienic activities (Table 2) were taken into consideration in the inquiry examination. Nutrition habits and most frequently consumed drinks and fruit were evaluated. The clinical examinations were conducted in the following way: sensitivity to mechanical stimuli was examined by passing a bougie over a tooth surface and thermally – directing an air current from a chip blower at the bare dentin. The preparation was applied in accordance with the producer's instructions. The solutions were applied at two stages upon the cleaned (with prophylactic toothpaste) and dried tooth surface with the help of separate applicators. At the first stage, four drops of the preparation from the bottle indicated as no. 1 (green) was being rubbed in for 10 seconds. At the second stage, four drops of the preparation from bottle no. 2 (orange) were being rubbed into the same tooth surface with the help of a new applicator for the following 10 seconds.

RESULTS

On the basis of the conducted inquiry examinations, it was discovered that the pain ailments due to thermal stimuli were observed in 80% of the examined patients, mechanical ones (tooth brushing) in 50% and chemical stimuli – in 50%. The conducted inquiry examinations proved that 54.8 % of the patients suffering from dentin hypersensitivity had not used any toothpaste or other pain-relieving agents. The remaining 55.2 % of the examined patients had made some attempts at limiting the hypersensitivity.

As far as the type of the used toothbrush is concerned, the examinations showed that 60% of the examined patients used a medium toothbrush, 10.44% used a hard toothbrush.

Table 1. Types of toothbrushes used by persons suffering from dentin hypersensitivity

Number of patients %	Type of the toothbrush		
	soft	medium	hard
	29.56 %	60%	10.44%
	9 patients	18 patients	3 patients

The frequency of toothbrushing was accordingly: twice a day – 56.9%, three times a day – 29.5% of the examined persons, and after each meal 13.6%. The conducted inquiry examinations showed that the most common brushing technique was the scrubbing method (horizontal – 72.44%) and the circular movements method (Fones's one – 63.44%).

Table 2. Brushing techniques used by the examined patients suffering from dentin hypersensitivity

Number of patients %	Brushing techniques			
	horizontal	vertical	circular	round
	72.44 %	45.9 %	63.44 %	23.4 %
	22 patients	13 patients	19 patients	6 patients

Numerous scientific studies confirm that the occurrence of hypersensitivity is connected with parafunctions resulting from the patients' stress susceptibility. It was observed in the conducted inquiry examinations that 19.4% of the patients were gnashing their teeth, and 34.4 % were clenching their teeth. Analysing nutrition habits of the examined persons, it was observed that dentin hypersensitivity occurred more often among patients consuming some kinds of fruit juice (apple, orange, grapefruit juice) – 64.9% and also fruit (oranges, apples) – 47.9%.

Table 3. Harmful habits (parafunctions) in persons suffering from dentin hypersensitivity

% of the patients	Parafunctions			
	Teeth gnashing	Teeth clenching	Lips and cheeks biting	Pencils and nails biting
	19.4 %	34.4 %	21.9 %	31.9 %

The clinical examinations confirm that the Green Or material is most effective in defects of non-carrietic origin, however the results in other factors responsible for hypersensitivity are also acceptable. The analysis of the factors causing dentin hypersensitivity showed that it was connected with gingive recessions (54.25%), defects of non-carrietic origin (37.5%).

Table 4. Examination results, taking into account factors causing hypersensitivity

Factors causing hypersensitivity	Number of teeth	
	No.	%
Gingive recession	110	45.8%
Defects of non-carrietic origin	90	37.5%
Mechanical injuries	29	12.1%
Parafunctions	11	4.1%

CONCLUSIONS

The highest effectiveness of the Green Or preparation was observed in the defects of non-carrietic origin. The therapeutic effect after single application of the drug was proved to be a fairly long-lasting one. The therapeutic effect was revealed by a considerable reduction of pain ailments, which is in accordance with other authors' observations (6, 8, 11).

The Green Or preparation is easy in application and patients assessed approvingly the organoleptic features of the preparation.

The clinical examinations confirmed that the Green Or preparation is recommendable both in a surgery and as the treatment continuation at a patient's house.

REFERENCES

1. Artelt H. M.: Leczenie nadwrażliwości szyjek zębowych związkami uwalniającymi fluor. *Stom. Współcz.*, 6, 536, 1995.
2. Collaert B., Fisher C.: Dentine hypersensitivity: a review. *Edodont. Dent. Traumatol.*, 7, 4, 145, 1991.
3. Dwornicka K.: Nadwrażliwość zębiny. *Twój Przegl. Stom.*, 2, 22, 2000.
4. Jańczuk Z.: *Stomatologia zachowawcza. PZWL*, 125, Warszawa 1997.
5. Jeżowska G., Sułkowska M.: Ocena skuteczności blokowania kanałków zębinowych substancjami zawartymi w pastach Oral B i Perio. *Mag. Stom.*, III, 10, 20, 1993.
6. Jodkowska E.: Ocena skuteczności lakierów fluorowych w znoszeniu nadwrażliwości szyjek zębowych. *Stom. Współcz.*, 2, 5, 454, 1995.
7. Kaczmarek U.: Terminologia i klasyfikacja ubytków twardych tkanek zęba pochodzenia niepróchnicowego. *Wrocł. Stom.*, 121, 1997.

8. Klepcka J. et al.: Zastosowanie lakierów w stomatologii na podstawie polskiego piśmiennictwa z lat 1990-1999. *Stom. Współcz.*, 8, 2, 45, 2001.
9. Materiały producenta: Densply De Trey Report, 6, 1, 1999-2000.
10. Nowości firmy Densply De Trey. *Stom. Współcz.*, Supl. 2, 63, 1999.
11. Pellowska-Pionek M. et al.: Ocena kliniczna skuteczności lakieru fluorowego Bifluorid 12 w leczeniu nadwrażliwości szyjek zębów. *Czas. Stom.*, LI, 2, 83, 1998.
12. Urbaniak B. et al.: Charakterystyka pacjentów z nadwrażliwością zębiny. *Mag. Stom.*, 9, 36, 2001.
13. Ziętek M.: Ocena kliniczna skuteczności preparatu Seal & Protect w leczeniu nadwrażliwości szyjek zębów. *Czas. Stom.*, LIV, 5, 313, 2001.

SUMMARY

The effectiveness of Green Or preparation in the treatment of cervical dental hypersensitivity was evaluated. This problem is difficult for patients and for dentists because of dual and unknown methods of treatment. The preparation was used in 30 patients between the ages of 20 and 70 years on 240 teeth with exposed and hypersensitive necks. The obtained results are acceptable, as total elimination of hypersensitivity was attained in 85% of cases, partial reduction of hypersensitivity in 15% cases.

Preparat Green Or w leczeniu nadwrażliwości zębiny

Oceniłono skuteczność preparatu Green Or w leczeniu nadwrażliwości szyjek zębów. Problem ten z powodu złożonej i nie do końca wyjaśnionej etiologii, a także wciąż niedoskonałych metod leczenia, stanowi przykrą dolegliwość dla pacjenta, a dla stomatologa często problem trudny do rozwiązania. Preparat zastosowano u 30 pacjentów w wieku 20–70 lat na 240 zębach z obnażonymi i nadwrażliwymi szyjkami. Uzyskane wyniki są zadowalające, gdyż całkowite zniesienie nadwrażliwości obserwowano w 75% przypadków, a zmniejszenie nadwrażliwości w 15% przypadków.