

Assessment of the Curaprox Ultra Soft CS 5460 Manual Toothbrush and the Curaprox CS 1006 Monobrush as Personal Hygiene Products

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ABSTRACT

This article presents the features of individual oral hygiene according to the use of the Curaprox CS 5460 manual toothbrush in combination with the Curaprox CS 1006 monobrush as an individual oral hygiene product. The effectiveness has been assessed using the OHI-S, PHR, and MAPI hygiene indices.

The results of the study show that the use of a Curaprox CS 5460 toothbrush in combination with a Curaprox CS 1006 monobrush for 1 week was (1.04 +0.28) on the OHI-S index and increased oral hygiene in PHP by 3.3 times compared with a conventional manual brush and 1.2 times when using only a brush-Curaprox CS 5460. The MAPI index improved by a factor of 1.2, 1.4, and 1.02, respectively. After 1 month of use, the OHI-S and PHP indices improved 1.1-fold in group III, 2-fold in group II, and 1.4-fold in group I. The MAPI index in groups I and III increased in comparison with the initial data by 22% and group II by 1.3 times. The obtained results allow the authors to recommend these means as the most simple, accessible, and reliable methods of preventing dental diseases-oral hygiene, the observance of which contributes to the prevention of diseases of the hard tissues of the teeth and periodontal tissues.

Key words: Curaprox CS 5460 toothbrush, Curaprox CS 1006 monobrush, OHI-S, PHR, and MAPI hygiene indices, Periodontal disease

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INTRODUCTION

Numerous studies conducted by Russian and foreign scientists have shown that the formation and growth of microbial plaque is one of the important triggers etiological and pathogenetic local risk factors for dental caries and inflammatory periodontal disease (IPD) [1,2]. Various methods of preventing plaque microflora, the introduction of the latest oral hygiene procedures, and the regular use of modern plaque removal techniques, considering local and general therapy and preventive check-ups in everyday practice, are the main type and guarantee of successful primary prevention of periodontal and dental hard tissue diseases [3,4]. Dentists all over the world recognize the index control of the quantitative detection of plaque on teeth and gums as an important aspect of objective assessment of periodontal and dental tissues [5,6]. Much emphasis is now placed on rational oral hygiene and especially on a comprehensive individual

selection of hygiene products for each patient individually, depending not only on their dental and hygiene status but also on their physiological and psychological state. In each patient, we considered the anatomical features of the structure of the dental rows, their alignment, and the individual characteristics of each tooth, including an assessment of the condition of the enamel. One of the basic and accessible tools for oral hygiene and effective mechanical removal of dental plaque is the traditional toothbrush [7]. Several toothbrushes and modern development of new models with different principles of action and various technical, aesthetic improvements are widely presented in the market. A diverse and rich enough assortment of toothbrushes by price policy and design is offered by numerous Russian and foreign manufacturers. CURAPROX ("CURADEN International AG", Switzerland) is a world leader in the production of personal oral hygiene products. CURAPROX has developed and patented its unique CUREN® ultra soft bristles made of 0.1mm ultra-thin polyester and toothbrushes with different numbers of bristles per brush head. Therefore, the selection of certified CURAPROX chiropractic toothbrushes made of

CUREN® bristles as personal hygiene aids for everyday use was the objective of our study.

The objective of the study

Evaluation of the Curaprox ultra soft 5460 toothbrush and Curaprox CS 1006 monobrush as a daily oral hygiene product.

METHODS

In our study, 90 patients of various ages with IPD were under observation at the State Budget Health Institution of the Republic of Bashkortostan Dental Polyclinic No. 5, Ufa, Russia. Each participant was given full information about the proposed toothbrushes before the study, explained the nature and purpose of the study, and signed an informed voluntary consent indicating the date of the study. Before the beginning of the clinical trial, all patients were given professional oral hygiene, motivation, training, and supervision of standard Bass brushing techniques and additionally cleaning contact surfaces and hard-to-reach areas of the teeth. We recommended brushing twice a day at home for 3 minutes using a voluntarily selected manual toothbrush and the same parodontax® toothpaste for all groups. During our study, the patients did not floss, brush, or used irrigators or other complementary hygiene products.

All the participants were assigned to 3 groups depending on the manual toothbrush used: Group 1 (n=30) was advised to only use the Curaprox Ultra Soft CS 5460 with 5,460 bristles per head for people with particularly sensitive enamel and gums. The second group (n=30), apart from the manual Curaprox CS 5460, also used the innovatively designed Curaprox CS 1006 monobrush with 1,006 bristles arranged on the head to clean the interdental spaces and tooth contact surfaces; the third group (n=30) used their usual manual toothbrush. There were no statistically significant age or gender differences between the groups.

Dental status was assessed using the OHI-S hygiene index, Patient Hygiene Performance Index, and the Modified Approximal Plaque Index [8]. To determine oral hygiene status, plaque assessment codes and criteria were used, and the results were interpreted. Dental hygiene was assessed before and after the use of toothbrushes after 1 week and 1 month.

Statistical processing of the results was carried out using conventional standard methods. Arithmetic mean (M), standard error of arithmetic mean (Se), and standard deviation were determined. The significance of the differences was assessed using Student's t-test. Differences were considered statistically significant at $p < 0.05$ [9].

RESULTS AND DISCUSSION

The analysis of our results at the stage of initial treatment showed that most individuals had an unsatisfactory level of oral hygiene according to the OHI-

S simplified oral hygiene index and averaged 2.63 ± 0.12 points in all groups. After a week of daily hygiene procedures, a reduced feeling of discomfort was noted by all participants. Patients in all groups improved the hygienic state of the oral cavity, a visual reduction of inflammatory phenomena was revealed. The index of OHI-S score in group I was (1,44+0,28). In group II, it improved by 3.3 times, in group III, by 1,6 times. Positive clinical effect during tooth brushing was noticed after the first week in all groups and according to PHP-index (decrease of pain, bleeding, purulence), but in group II the combined use of Curaprox CS 5460 and Curaprox CS 1006 monobrush improved the oral hygiene, which corresponded to the codes and criteria of plaque evaluation as "good" level of hygiene. At the same time, groups I and III also showed a 1.7-fold improvement in oral hygiene compared to the conventional manual toothbrush and 1.2-fold with the Curaprox CS 5460 brush alone. The MAPI index score improved by a factor of 1.2 and 1.3, respectively, and the levels of tooth brushing by codes and assessment criteria in groups I and II were shown as "optimum hygiene" and in group III as "incorrect hygiene".

After using these products for 1 month, the OHI-S and PHP indices improved in group III, by a factor of 1.1, in group II, by a factor of 2, and in group I, by a factor of 1.4. The MAPI index in groups I and III improved from the initial data by 22% and by a factor of 1.3 in group II.

Such high effect of application in group II is due to better and non-traumatic removal of plaque not only in the vestibular-oral surface but also in the hard-to-reach interdental spaces with ultra-soft and fine bristles, which can easily adapt to the individual shape of the gingival margin, without traumatizing the enamel and periodontal soft tissues. Simultaneously with brushing, a gentle massage of the gums is possible to improve microcirculation in the gum tissues.

CONCLUSION

In our study, we found that the combined use of two toothbrushes, certified Curaprox CS 5460 soft toothbrush designed for people with particularly sensitive enamel and gums, together with the innovatively designed Curaprox CS 1006 monobrush designed for cleaning the teeth on the chewing and lateral surfaces of molars, gingival sulcus, and interdental spaces in hard-to-reach areas of teeth, provided the most effective and more thorough removal of dental plaque than a single brush. Already after the first week of use, a good level of oral hygiene was obtained, the results reinforced after 1 month of use, which significantly prevented the progression of the disease and invasive and more expensive interventions.

The results we obtained allow us to recommend these means as the simplest, most accessible, and reliable methods of preventing dental diseases-oral hygiene, the observance of which contributes to the prevention of diseases of the teeth and periodontal tissues.

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