

Use of dentifrices and mouthwashes during orthodontic treatment in the clinical management of orthodontists

Utilização de dentifrícios e colutórios durante o tratamento ortodôntico na conduta clínica dos ortodontistas

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ABSTRACT

Objective: To evaluate the knowledge of orthodontic professionals regarding the prescription of dentifrices and antiseptics during orthodontic treatment. **Methods:** An observational and descriptive exploratory study of national scope was conducted with 440 Brazilian orthodontists, based on previous sample calculations, to evaluate the clinical practice of orthodontists in prescribing dentifrices and antiseptics. Self-managed electronic questionnaires were sent to orthodontic professionals. The data were analyzed by means of absolute and relative frequency distribution tables. **Results:** It was verified that the most indicated mouthwash (39.8%) was Colgate Periogard® and 421 of the participants (95.7%) know its active ingredient (chlorhexidine digluconate). Besides Colgate Periogard® antiseptic, the participants were also questioned about which active ingredient present on the following antiseptics, whose assertive answers were in the following order of %, Cepacol® (Sanofi-Aventis®) with 60.7%, Colgate Plax® (Colgate®) with 54.5% and Listerine® (Jhonson&Jhonson®) with 51.6%. As for the chlorhexidine therapeutic regime, 63.9% have stated assertively its use, being this one of 2 times a day during 7 to 10 days. The most indicated tooth was Colgate Total 12®, and 60.18% of these individuals correctly indicated its active compound. **Conclusion:** According to the methodology employed, it could be concluded that orthodontic professionals know and prescribe methods of chemical control to patients during orthodontic treatment and most identify the active chemical compounds present in antiseptic and tooth formulas.

Indexation terms: Dentifrices. Mouthwashes. Orthodontics.

RESUMO

Objetivo: Avaliar o conhecimento dos profissionais da ortodontia quanto à prescrição de dentifrícios e antissépticos durante o tratamento ortodôntico. **Métodos:** Foi realizado um estudo observacional e descritivo exploratório de abrangência nacional com

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How to cite this article

Barros PAG, Lima CBV, Custodio W, Venezian GC, Vedovello SAS, Góes VFS. Use of dentifrices and mouthwashes during orthodontic treatment in the clinical management of orthodontists. RGO, Rev Gaúch Odontol. 2022;70:e20220020. <http://dx.doi.org/10.1590/1981-86372022002020200081>

440 ortodontistas brasileiros, baseado em cálculo amostral prévio, para avaliação da prática clínica dos ortodontistas na prescrição de dentifrícios e antissépticos. Questionários eletrônicos auto administrados foram enviados aos profissionais da Ortodontia. Os dados foram analisados por meio de tabelas de distribuição de frequência absolutas e relativas. **Resultados:** Verificou-se que o antisséptico bucal mais indicado (39,8%) foi o Colgate Periogard® (Colgate®) e 421 dos participantes (95,7%) conhecem o seu ingrediente ativo (digluconato de clorexidina). Além do antisséptico Colgate Periogard®, os participantes também foram questionados sobre qual o ingrediente ativo presente nos seguintes antissépticos, cujas respostas assertivas estavam na seguinte ordem %, Cepacol® (Sanofi-Aventis®) com 60,7%, Colgate Plax® (Colgate®) com 54,5% e Listerine® (Johnson&Johnson®) com 51,6%. Quanto ao regime terapêutico da clorexidina 63,9% indicaram assertivamente sua utilização sendo a mesma de 2 vezes ao dia durante 7 a 10 dias. O dentifrício mais indicado foi o Colgate Total 12®, sendo que 60,18% desses indivíduos indicaram corretamente seu composto ativo. **Conclusão:** De acordo com a metodologia empregada, pôde-se concluir que os profissionais da ortodontia conhecem e prescrevem métodos de controle químico aos pacientes durante o tratamento ortodôntico e a maioria identifica os compostos químicos ativos presentes nas fórmulas de antissépticos e dentifrícios.

Termos de indexação: Dentifrícios. Antissépticos bucais. Ortodontia.

INTRODUCTION

Orthodontic treatment with a fixed appliance makes sanitation more difficult, leading to a greater accumulation of dental biofilm [1]. Proper control of bacterial accumulation is important, avoiding the appearance of white spot lesions, caries, and gingivitis [2-5].

Orthodontic aparatology limits the control of biofilm only by mechanical methods [6]. These are obtained by brushing and using dental floss, provided it is done properly and at regular intervals [7]), and orthodontists are responsible for oral hygiene education because of the greater risk to which their patients are subjected [2]. However, this alone is not enough to remove all pathogenic microorganisms, since about 67% of intraoral tissues are not affected by brushing and flossing [7,8].

Chemical control is required through the use of dentifrices and mouthwashes [9]. The complementary use of chemotherapeutic agents helps in method deficiencies, reducing plaque formation and gum inflammation [7,10,11]. Both toothpastes and mouthwashes contain active ingredients and are recommended according to the clinical need of each patient [12].

The use of mouthwashes has been proposed to reduce oral bacteria levels. Most antimicrobial agents are chemical products that present selective toxicity. They are constituted of a mixture of the active component with water, alcohol, surfactants, humectants, and flavorings [13]. They act, in general, by breaking down the cell wall compromising bacterial metabolic activities [10]. Among the most commonly used antimicrobial agents are chlorhexidine, a gold standard chemical agent in plaque control, in addition to cetylpyridinium chloride, triclosan and essential oils [11,12,14].

Dentifrices are presented as chemical compound constituents that play a specific role in the formulation. Fluorides, abrasives, moisturizers, thickeners, surfactants, and sweeteners are present [12, 15].

No product used for the chemical control of biofilm, which is available on the market, has all the ideal requirements together and may present side effects and little efficiency [10]. And, as there is currently a wide variety of chemical agents for the control of dental biofilm, with different mechanisms of action, it is essential that the professional know them in order to achieve successful treatments [10,16].

Given the scarcity of studies that evaluate the knowledge of orthodontists regarding the indication of chemical agents for plaque control during orthodontic treatment, this study aimed to evaluate the knowledge of orthodontic professionals in prescribing dentifrices and mouthwashes.

METHODS

Observational and descriptive exploratory study performed with Brazilian orthodontists. An electronic questionnaire was sent to the participants with the help of the ABOR (Brazilian Association of Orthodontics) website,

through the Regional Councils of Dentistry of the various Brazilian states and also through some postgraduate teaching institutions in Orthodontics. The online survey allows for greater speed, economy, good use of responses and overcomes geographical barriers, admitting to inquire orthodontists from all over Brazil.

The sample size was calculated in the EpiInfo program (Centers for Disease Control and Prevention, Atlanta, U.S.A.). For the significance level of 5%, test power of 80, 393 orthodontists were required. Taking into account the possibility of losses, the sample was increased by 15%. We excluded 5% of the sample due to incomplete responses.

Of the 730 questionnaires sent between June and December 2018, a total sample of 440 orthodontists answered the electronic questionnaire equivalent to a response rate of 60.27%. All volunteers were aware of the informed consent form and data were collected on knowledge and clinical practices in relation to the prescription of dentifrices and antiseptics.

The data was collected through a self-managed electronic questionnaire, produced in Google Forms, consisting of six closed and two open items. All questions and answer options of the closed items are presented in table 1. In the open items the participants were asked about the most indicated tooth in their clinical practice as well as the active ingredient (antimicrobial and/or desensitizers) present in it and could prepare their own answers.

The data were analyzed by means of absolute and relative frequency distribution tables. All the analyses were performed in the R program, considering the 5% significance level.

This study was approved by the Committee on Ethics in Research on Human Beings (CAAE: 87968618.9.0000.5385) and was conducted in accordance with Resolution no. 466 of 2012 and the principles established in the Declaration of Helsinki (2000).

RESULTS

The final sample consisted of 440 orthodontic professionals, considering 5% of incomplete responses, obtaining a response rate equivalent to 60.27%. The results of their perception in prescribing dentifrices and mouthwashes during orthodontic treatment are presented in tables 1 and 2.

In relation to the question which has evaluated which mouthwash is more indicated on professionals clinical practice, it was obtained that 175 (39.8%) participants pointed out Colgate Periogard® (Colgate®), 144 (32.7%) Colgate Plax® (Colgate®), 66 (14.5%) other mouthwashes of different brands, 52 (11.8%) Listerine® (Johnson & Johnson®) and 3 (0.7%) Cepacol® (Sanofi-Aventis®), according to data presented on table 2.

The subsequent question was to analyze which active ingredient was present in the following mouthwashes: Colgate Periogard®, Listerine®, Colgate Plax® and Cepacol®. In relation to this questioning, 421 (95.7%) participants

Table 1. Questionnaire on the use of mouthwash during orthodontic treatment in the clinical management of orthodontists.

Questionnaire of collutories used in the study
What is the most indicated mouthwash in your clinical practice? Colgate Periogard® (Colgate brand)/Listerine® (Jhonson & Jhonson brand)/Colgate Plax® (Colgate brand)/Cepacol® (Sanofi-Aventis brand)/Other
What is the active ingredient (antimicrobial) of Colgate Periogard® mouthwash (Colgate brand)? cetylpyridinium chloride/digluconate chlorhexidine/essential oils/triclosan
What is the active ingredient (antimicrobial) of Listerine® (Jhonson&Jhonson brand) mouthwash? cetylpyridinium chloride/digluconate chlorhexidine/essential oils/triclosan
What is the active ingredient (antimicrobial) of Colgate Plax® mouthwash (Colgate brand)? cetylpyridinium chloride/digluconate chlorhexidine/essential oils/triclosan
What is the active ingredient (antimicrobial) of Cepacol® (Sanofi-Aventis brand)? Cetylpyridinium chloride/digluconate chlorhexidine/essential oils/triclosan
What is the chlorhexidine therapy regimen 0.12% (number of times a day and for how long? 3 times a day for 5 days/ once a day for 15 days/ 2 times a day for 7 to 10 days/ 3 times a day for 10 to 15 days

answered assertively the active ingredient present on Periogard®, 227 (51.6%) in relation to the Listerine® component, 240 (54.5%) that of Colgate Plax® and 267 (60.7%) that of Cepacol® compound (table 2).

The collaborators were also questioned about the therapeutic regimen, which presented the number of times and for how long it prescribes chlorhexidine. There were 281 (63.9%) assertive answers, which indicated the use of the drug twice a day for 7 to 10 days [16]. In addition, wrong answers were noted regarding this questioning in which 71 (16.1%) of the participants recommended this mouthwash once a day for 15 days, 49 (11.1%) indicated 3 times a day for 5 days, and 39 (8.9%) indicated 3 times a day for 10 to 15 days (table 2).

In addition, in relation to the questioning of mouthwashes, it was investigated about the prescription of the most indicated dentifrices in the clinical practice of the participants, as well as the respective active ingredients present in them. Among all the toothpastes, the most indicated (25.7%) was Colgate Total 12® (Colgate®), being that 73.5% of the professionals that indicate it recognized the active ingredient present in it (table 3).

Table 2. Analyses of knowledge and indication of mouthwash by orthodontists.

Variable	Category	n (%)
Most indicated mouthwash	Cepacol® (brand Sanofi-Aventis)	3 (0.7%)
	Colgate Periogard® (brand Colgate)	175 (39.8%)
	Colgate Plax® (brand Colgate)	144 (32.7%)
	Listerine® (brand Johnson & Johnson)	52 (11.8%)
	Other	64 (15%)
	cetylpyridinium chloride	11 (2.5%)
Mouthwash active ingredient: Colgate Periogard® (brand Colgate)	#chlorhexidine digluconate	421 (95.7%)
	essential oils	
	Triclosan	
	did not answer	0 (0.0%)
		8 (1.8%)
		0 (0.0%)
Mouthwash active ingredient: Listerine® (Johnson & Johnson brand)	cetylpyridinium chloride	91 (20.7%)
	chlorhexidine digluconate	39 (8.9%)
	#essential oils	227 (51.6%)
	Triclosan	81 (18.4%)
	did not answer	2 (0.5%)
Mouthwash active ingredient: Colgate Plax® (Colgate brand)	cetylpyridinium chloride	146 (33.2%)
	chlorhexidine digluconate	32 (7.3%)
	essential oils	18 (4.1%)
	#triclosan	240 (54.5%)
	did not answer	4 (0.9%)
Mouthwash active ingredient: Cepacol® (brand Sanofi-Aventis)	#cetylpyridinium chloride	267 (60.7%)
	chlorhexidine digluconate	22 (5.0%)
	essential oils	71 (16.1%)
	Triclosan	77 (17.5%)
Chlorhexidine therapeutic regimen 0.12%	did not answer	3 (0.7%)
	1 time a day for 15 days	71 (16.1%)
	#2 times a day for 7 to 10 days	281 (63.9%)
	3 times a day for 5 days	49 (11.1%)
	3 times a day for 10 to 15 days	39 (8.9%)

Table 3. Analysis of the most indicated dentifrices and the responses of the respective active components pointed out by the participants.

Most suitable toothpaste	n (%)	Active component assertive responses
Colgate Total 12®	113 (25.7%)	73.5%
Colgate®	56 (12.7%)	39.3%
Colgate Sensitive Pró Alivio®	40 (9.1%)	65.0%
Sensodyne®	32 (7.3%)	81.3%
Outros Dentífrícos	199 (45.2%)	57.1%
Total	440 (100.0%)	-----

DISCUSSION

Based on the literature, fixed orthodontic apparatus favors the accumulation of plaque, making it necessary to associate the chemical method with the mechanical control of the biofilm. Thus, mouthwashes and toothpastes act as adjuvants, helping to maintain the health of the oral environment [17,18]. The determining factor for the success of orthodontic treatment is the collaboration of patients in terms of sanitization, being a fundamental role of the professional to guide and motivate their patients [4,19,20].

In this study, conducted with orthodontic professionals, it was possible to verify that all participants prescribe dentifrices and mouthwashes for their patients. Most prescribe Colgate Periogard®, which highlights the results presented in the literature which report that this antiseptic is currently the most indicated [10,16].

The results of this study showed that most participants identify chlorhexidine as an active ingredient of Periogard®, and this drug is considered an antimicrobial of broad spectrum action, which promotes membrane rupture and extravasation of the cell structures of the microorganism, being recognized as a gold standard antibiotic in the literature [14].

This component is efficient in low concentrations and has substantivity, prolonging its therapeutic action [21], emphasizing the importance of recognition of its properties and indication by dental professionals corroborating the data presented in this research [17,22].

As for the 0.12% chlorhexidine therapeutic regimen, it is recommended mouthwashes, twice a day, morning, and night, for 7 to 10 days. The time of use of this component should be limited due to the possible adverse effects that it may cause, such as dental staining, changes in taste, irritation and scaling of mucous membranes [23], being considered a cause for concern the fact that almost half of the professionals who participated in this study did not correctly prescribe the therapeutic regimen of this mouthwash.

Still in relation to the mouthwashes available commercially, Colgate Plax® stands out, presenting the triclosan as the main active agent, presenting action on plaque and anti-inflammatory activity and that in the present study was the oral solution that received the second highest indication by professionals [11]. Additionally to mouthwashes, the third most indicated by the participants of this research was Listerine®, composed of a specific blend of essential oils (thymol, eucalyptus, menthol and methyl salicylate), being an antimicrobial agent, whose mechanism of action is closely related to the modification in the cell wall of bacteria and when associated with alcohol is reported numerous adverse effects [24,25]. It was also observed that more than half of the professionals responded assertively about the active compounds present in Colgate Plax® and Listerine®.

A minimum percentage of participants in this research indicates the use of Cepacol®, however, more than half of them assertively recognized its respective active ingredient. Cetylpyridinium chloride acts as an antimicrobial by interfering with the permeability of the bacterial cell membrane, favoring cell lysis and, consequently, decreasing its metabolic activity [26].

The literature has shown that mouthwashes follow the following order of indication in clinical practice, being the most prescribed Periogard®, followed by Colgate Plax®, Listerine® and Cepacol® [10,14], these findings are in line with the results observed in this study.

However, a previous study found that products containing cetylpyridinium chloride predominate in commercial establishments, followed by essential oils, chlorhexidine digluconate and, finally, triclosan gantrez [11]. In this sense, it is noted that the antiseptics most indicated in this study and by studies in the literature differ from the greater predominance of active ingredients present in the trade, this fact may be associated with the influence of advertisements in the media, which seems to induce professional participation in this choice [27].

In a complementary way, the indication of toothpastes during orthodontic treatment was analyzed in this study and it could be seen that professionals pointed out several options of toothpastes, being the most indicated the Colgate Total 12®, which meets the works in the literature that identify it as the most recommended [10,16].

In the present work, when identifying the active ingredient of the recommended toothpaste, the highest percentage of mistakes were related to the professionals who pointed out Colgate®, because a large percentage of these did not indicate sodium monofluorophosphate as the responsible for its activity [28,29]. Simultaneously, the vast majority of orthodontic professionals who indicated Sensodyne® recognized strontium chloride as their main drug [29].

Studies on perception hinder the fact that a considerable number of employees receive electronic questionnaires and do not answer them, thus reducing the sample size.

Another factor that limited the present work was not presenting the objective and catalogued answers when questioning which tooth and active ingredient is present and indicated in clinical practice. This highlighted a variety of toothpastes and active components as responses.

However, the relevance of this study highlighted that the practice of indicating mouthwashes and dentifrices has been carried out by orthodontic professionals to assist in the mechanical control of dental biofilm. Another important finding of this study was that orthodontists have good knowledge about active chemical compounds present in mouthwashes and toothpaste formulas.

CONCLUSION

With this research, it could be concluded that professionals prescribe dentifrices and mouthwashes to their patients during orthodontic treatment. The most indicated mouthwash and toothpaste, respectively, were Colgate Periogard® and Colgate Total 12®, and the great majority of the participants demonstrated to recognize the active ingredients present in these formulations.

Collaborators

PAG Barros, substantial contributions to the conception of the work and drafting the work. CBV de Lima, W Custodio, GC Venezian and SAS Vedovello, revising it critically for important intellectual content. VFF Góes, was the research adviser, was one of the responsible for the study design and performed the critical review of the manuscript.

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Received on: 2/6/2020

Final version resubmitted on: 14/8/2020

Approved on: 7/1/2021

Assistant editor: Luciana Butini Oliveira