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Research Article

Evaluation of the Level of Knowledge of Parents and Guardians about Fluorosis and Fluoride Dentifrice

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Abstract:

The use of dentifrices is an important method for preventing dental caries. Associated with fluoridation of public water supplies, there was a decline in the prevalence of dental caries in Brazil and worldwide. On the other hand, there has been an increase in the occurrence of fluorosis. Fluorosis occurs at the time of tooth formation with excessive intake of fluoride. From this perspective, in places where fluoridated water is available in the public supply, some dentists have recommended fluoride dentifrices in low concentrations, or even without fluoride. However, it is known that dentifrices with low concentrations of fluoride are not effective in fighting tooth decay. The current recommendation is that dentifrices for children should have between 1000 and 1100 ppm of fluoride. Additionally, the amount should be controlled depending on the age of the child. Brushing in children should always be supervised by parents or guardians, avoiding the risks of fluoride ingestion, and checking that the child brushes correctly. Some studies have addressed the level of knowledge of parents or guardians about the benefits of fluoride. However, knowledge about the relationship between fluorosis and fluoride is not widespread. The purpose of this article is to analyze the knowledge of parents or guardians regarding fluoride dentifrices and their ideal amount (depending on the age of the child), ideal concentration of fluoride and what their purposes are, as well as the correct choice of the product.

***Keywords:** Dental fluorosis; Oral Hygiene; Oral and Dental Hygiene Products; Educational Early Intervention; Pediatric Dentistry.*

Introduction

Caries is a multifactorial disease that affects the world population, causing demineralization of dental structures[1]. In Brazil and worldwide, through fluoridation of public water supplies and fluoride dentifrices associated with brushing, there has been a decline in the prevalence of caries[2-4]. Today, fluoride can be considered the most effective substance in the control and prevention of dental caries[4,5,7-9]. However, it must be ingested and applied in adequate concentration and amounts, so that there are no side effects.

Fluoride can be used by systemic use, through the ingestion of fluoride from public water supplies, and by topical application, applied directly to the tooth, by self-application or professional use. Self-application involves fluoride dentifrices and mouthwashes. Professional application includes gels, mousses and varnishes[10].

Fluoride dentifrices have been widely studied in recent decades. It is one of the most important agents in reducing dental caries in recent years[3,5,6,9-11]. Among the forms of topical application, it is the one that presents the greatest advantage. Besides the association with mechanical brushing, the dentifrice helps maintain fluoride in the oral cavity, even if in low concentrations. All adults with teeth should use this product in an ideal fluoride concentration and in an amount that is not too exaggerated[4-6]. In children, however, excessive and/or chronic intake of fluoride during the formation of permanent teeth may cause systemic toxicity, leading to a disorder in dental development known as dental fluorosis[11,12]. From this perspective, the use of fluoride dentifrices in children aged 0 to 4 years should be supervised by those responsible for them, since they tend to swallow the product during brushing[4,12,13].

The knowledge of parents or guardians about the benefits of fluoride in relation to dental caries has been studied. However, knowledge about excess fluoride and its side effects, which may cause dental fluorosis, is not widespread[12-14]. Additionally, parents or guardians have some difficulty in choosing the product, and almost no knowledge about the ideal concentration and amount of fluoride for children, depending on their age[12,13]. It is of utmost importance that the dental surgeon gives the correct orientation to the parentes or guardians about fluoride, so that there are no risks to the oral health of the child.

From this perspective, the purpose of this article is to analyze the knowledge of parents or guardians regarding fluoride dentifrices and their ideal amount (depending on the age of the child), ideal fluoride concentration, and what their purposes are, as well as the correct choice of the product.

Materials and Method

This study was conducted at the Pediatric Dentistry Clinic of Universidade Brasil, between March 2017 and November 2019. The study was conducted with parents or guardians, whose children were between 4 to 11 years old. An interview was conducted using a questionnaire containing 9 questions. The questions presented questions about socioeconomic conditions, oral hygiene habits of the child, and knowledge of parents or guardians regarding the concentration and ideal amount of fluoride in fluoride dentifrices.

Results

A total of 132 questionnaires were collected from parents or guardians. Tables 1 and 2 summarize the answers to the questionnaires. Table 1 presents the results according to socioeconomic data. Table 2 shows the answers regarding the oral hygiene of the children. At the end of the interview, all were correctly oriented on the subject.

Table 1: Results referring to socioeconomic data.

Socioeconomic Issues	N	%
Schooling of parents or guardians		
Elementary school complete	58	43,9
High school complete	67	50,7
Higher Education	7	5,4
Family income*		
1 minimum wage	56	42,4
2 minimum wages	48	36,3
3 minimum wages	24	18,1
+ 4 minimum wages	2	1,6

*Two respondents (1.6%) said they had no income.

Table 2: Answers regarding to the oral hygiene of children.

Oral Hygiene Habits	N	%
Starting Brushing Age		
6 months	48	36,3
1 year	28	21,3
Over 1 year	56	42,4
Who performs the child's brushing		
Parents or Guardians	24	18,2
Child	72	54,5
Parents or guardians with the child	36	27,3
Who puts the dentifrice on the brush		
Parents or Guardians	56	42,4
Child	76	57,6
Have you ever been to a dental office (besides Dental School)		
Yes	84	63,6
No	48	36,4
Amount of dentifrice pointed to in the image (see Figure 1)		
Rice Grain	24	18,2
Pea grain	56	42,4
Longitudinal technique	52	38,4

One of the questions showed an image with three toothbrushes with different amounts of dentifrice (Figure 1), and the person responsible for the toothbrush marked the one that best represented the amount of toothpaste normally used by the child.

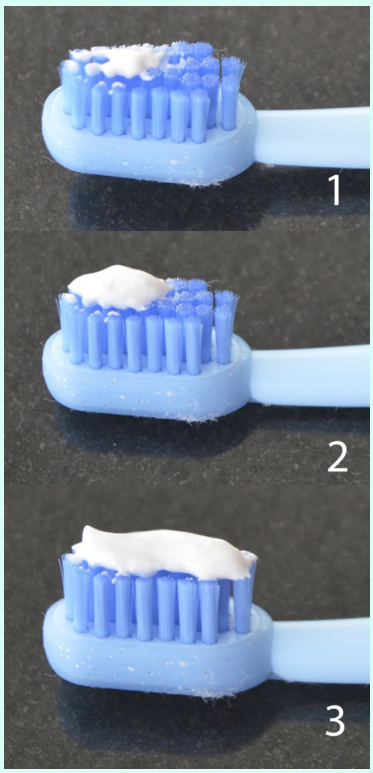

Figure 1: *Amount of dentifrice used by parents or guardians.*

Among the brands of dentifrices used, four brands were mentioned: Colgate™, Oral B™, Sorriso™ and Tandy™. Some interviewees (n=25, 18.9%) did not inform the brand of dentifrice used, only whether it was for adult or child use. None of them could inform the fluoride concentration found in the toothpastes mentioned.

Discussion

Fluoride has no ability to interfere in plaque formation and in preventing the transformation of sugar into acids. However, it is of fundamental importance in reducing its Evolution[15,16].

The frequent application of topical fluoride ensures the constant deposition of calcium fluoride - an important cariostatic compound in the remineralization and demineralization process - on the tooth surface[4,8]. Its frequent use is indispensable for the occurrence of the preventive effect[15,16]. Fluoride also presents itself as a bactericidal agent on dental biofilms, when in high concentration[7].

In communities with public fluoridated water supply, the reevaluation of fluoride concentration from dentifrices should be considered, since this association may cause fluorosis. The proper balance between caries prevention and fluorosis would be to reduce the fluoride concentration to 500 to 600 ppm soluble fluoride. The caries activity risk of infant patients should be assessed. Preschool children with high caries risk should use conventional dentifrices with 1000-1100 ppm fluoride, thus ensuring preventive benefits[4,13,15-17]. In contrast, for young children with low caries risk, brushing without dentifrice is recommended[7]. However, recommending a fluoride-free dentifrice in public health seems to be socially irresponsible. In Brazil, the use of fluoride dentifrices is one of the factors that have surely contributed to the decline of caries, starting in the 1990s[15,16].

Special care should be taken with the dosage of the product for the different age groups. For babies or children who cannot spit (0 to 2 years old), the amount of dentifrice should be the equivalent of a rice grain. For children who can spit (up to 3 years old), the amount should be the equivalent of a peas grain. While the child is not capable of self-care, the use of dentifrice is the responsibility of parents or guardians, thus ensuring greater safety regarding dental fluorosis, or any other acute or systemic toxicity symptoms[13,15-17].

Fluoridation of public water supplies represents one of the main and most important public health measures, and can be considered as the most effective method to control dental caries, when considering the collective scope. The World Health Organization has developed a program to promote fluoridation of public water supplies, presented at the 25th World Health Assembly, in 1975. In Brazil, the implementation of public water supply fluoridation occurred in 1976. Brazil was the first country to prove the benefits obtained by fluoridation of public water supplies in reducing dental caries. There was a 67% reduction in caries prevalence after water fluoridation[2].

There is no evidence that a low fluoride dentifrice has the same anti-caries benefit as a 1,000 ppm dentifrice. It also does not prevent fluorosis, because it is safer to brush your teeth using a small amount of dentifrice with 1,100 ppm fluoride. From this perspective, it seems much simpler to guide about using a small amount of dentifrice until children are old enough for self-care. The relationship between the use of fluoride dentifrices by children aged 0 to 4 years and the risk of fluorosis (due to ingestion of the dentifrice) is low. Similarly, fluorosis from fluoride in water or dentifrice is very mild. Therefore, it would be less harmful to run the risk of mild grade fluorosis, which does not impact the population, instead of exempting fluoride, running the highest risk in caries prevalence, which compromises the aesthetics, function and life of individuals[15,16].

The orientation for oral health care to parents and guardians and subsequently to children should be carried out. However, in the present study, it was observed that there is still some divergence in the orientation. Some dental surgeons still do not provide orientation on the current recommendation of fluoride and the correct amount for children. Parents or guardians still have no knowledge about the relationship between fluorosis risk and fluoridated dentifrice, and some still believe that dentifrice has a merely cosmetic role.

Only 27.3% of parents or guardians accompany their children during brushing and 42.4% put the dentifrice on the toothbrush of child, which is a worrisome result. Parents or guardians should always accompany their children, to prevent not only the risk of fluoride ingestion, but also to check whether the child is brushing correctly[7,13]. Additionally, the development of public health policies regarding the correct use of fluoride dentifrices is necessary[13].

Conclusions

Fluoride dentifrices are important in the control and prevention of dental caries, but in low concentration (500 to 550 ppm) they are not effective in caries control. The ideal concentration indicated for children is 1000 to 1100 ppm of fluoride, and the amount of dentifrice put on the toothbrush should be controlled, depending on the age of the child. Fluoride dentifrice is safe in relation to acute fluoride toxicity. Fluorosis does not affect quality of life in patients who use fluoride dentifrices, even in regions with fluoridated water. Brushing should always be supervised by parents or guardians, in order to avoid not only ingestion of the product, but also incorrect use.

Based on the results, parents or guardians have knowledge about fluoride and its purpose, but do not know about its risks. They do not use the recommended amount according to the age of the child and there is no knowledge about the ideal fluoride concentration for children. It was also observed that parents or guardians are not aware of the motivation to choose the product. Therefore, there is a need to invest in education and information about fluoride dentifrices for children and their indications, and to create strategies aimed at guiding those responsible and the children themselves about the correct form of the product and the risks it offers.

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