



ORIGINAL ARTICLE

Impact of dental fluorosis on the aesthetic perception of adolescents between 15-17 years

Impacto de la fluorosis dental en la percepción estética de los adolescentes entre 15-17 años

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ABSTRACT

Introduction: dental fluorosis is an endemic pathology, produced by excessive fluoride intake, clinically it presents pigmentations from white to dark brown, affecting tooth enamel and dentin. Self-esteem may be altered in individuals with dental fluorosis. Concern about pigmentation in the teeth generates insecurity when speaking or smiling and this results in a negative self-perception of the individual's dental aesthetics.

Objectives: to evaluate the influence of fluorosis on the aesthetic self-perception of adolescents between 15-17 years of age, belonging to San José de Guaytacama Educational Unit.

Methods: a total of 192 young people participated in the study. To analyze the level of fluorosis, the DEAN Index was used and to evaluate aesthetic self-perception, the Oral Health Impact Profile (OHIP-Esthetic) was applied; The data were processed and analyzed in the SPSS program (Statistical Package for Social Sciences).

Results: the young people presented different degrees of fluorosis: severe (4,69 %), moderate (14,06 %), mild (19,79 %), very mild (25,0 %) and normal (36,46 %) and statistically it was determined that there is no relationship significant difference in aesthetic self-perception with age, sex, and with the presence of fluorosis in these adolescents.

Conclusions: although it was determined that there is no significant relationship between aesthetic self-perception and fluorosis in these adolescents, this pathology affects the self-esteem of those who have high levels of fluorosis, since they run the risk of looking less attractive or healthy.

Keywords: Fluorosis, Dental; Adolescent; Esthetics.

RESUMEN

Introducción: la fluorosis dental es una patología endémica, producida por la excesiva ingesta de flúor, clínicamente presenta pigmentaciones desde un blanco a un marrón oscuro, afectando el esmalte dental y la dentina.

Objetivos: evaluar la influencia de la fluorosis en la autopercepción estética de adolescentes entre los 15-17 años de edad, pertenecientes a la Unidad Educativa San José de Guaytacama.

Métodos: estudio observacional, descriptivo, transversal, realizado en la Unidad Educativa San José de Guaytacama, donde participaron 192 jóvenes que cumplieron los criterios de selección. Fueron aplicados el Índice de DEAN y el Perfil de impacto de salud oral (Oral Health Impact Profile OHIP- Esthetic), para obtener la información que dio salida a las variables analizadas, empleándose métodos de estadística descriptiva e inferencial. Se respetó la ética médica.

Resultados: los jóvenes presentaron diferentes grados de fluorosis: severa (4,69 %), moderada (14,06 %), leve (19,79 %), muy leve (25,0 %) y normal (36,46 %); no determinándose estadísticamente la existencia de relación significativa entre la autopercepción estética con la edad, el sexo, y además con la presencia de la fluorosis en estos adolescentes.

Conclusiones: Aunque se determinó que no hay relación significativa entre autopercepción estética y fluorosis en estos adolescentes, esta patología afecta la autoestima de los que presentan altos niveles de fluorosis, pues corren el riesgo verse menos atractivos o saludables.

Palabras Clave: Fluorosis Dental; Adolescentes; Estética.

INTRODUCTION

Dental fluorosis is an anomaly in the development of enamel caused by excessive intake of fluoride during the formation of dental tissues, which is why it is considered an endemic condition in areas where water has concentrations exceeding 1.5 mg/L. This defect can occur throughout tooth development, during which time water intake affects the formation of enamel, between 20 and 36 months of life for permanent dentition and in intrauterine life for temporary dentition, although in the latter fluorosis is less frequent.^(1,2)

In Ecuador, studies carried out by the MSP identified Chimborazo, Tungurahua and Cotopaxi as provinces with high levels of fluoride without monitoring in recent years; this information is confirmed in a study carried out in 2021 in the province of Cotopaxi where it was found that the prevalence of very mild and mild fluorosis is the most frequent in this sector without relation to the age or sex of the participants.^(3,4)

Teeth affected by fluorosis are mainly characterized by hypomineralization and increased porosity of the enamel structure. The degree of severity of dental fluorosis is determined by the dose and duration of exposure to fluoride, level of physical activity, weight and nutritional status of the individual, among other factors.⁽⁵⁾ The enamel changes color from fine white lines to mottled enamel. Depending on the degree of severity, abnormalities in tooth coloration and dark spots from yellow to chocolate brown affect the appearance of young people because the smile is the first impression of the teeth.⁽⁶⁾

Obtaining a pleasant smile and satisfactory dental aesthetics is not only a matter of vanity, but of necessity in today's day and age, due to the beauty standards imposed by society. Many individuals, by not having this desired appearance, lose self-esteem, leading them to a reserved and timid behavior, and most patients dissatisfied with their smile seek to modify it in some way.⁽⁷⁾

Stains caused by dental fluorosis, particularly in the upper anterior teeth, compromise the patient's aesthetics and can affect their self-esteem. Thus, today, patient dissatisfaction with their dental appearance not only includes concepts such as missing teeth, position and color of the teeth, but the psychosocial impact and quality of life related to oral health have also become increasingly important.⁽⁸⁾

In light of this, it is important to measure and evaluate dental aesthetics based on the patient's perception in an objective manner, using instruments that allow it to be quantified and understood. Before carrying out a dental treatment that will affect dental aesthetics, the dentist must be clear about the dental treatment approaches according to the severity of the disease and the patient's aesthetic self-perception, the expectations of the treatment and the significance in the entire biopsychosocial sphere of the patient.⁽⁹⁾

In some provinces of Ecuador, such as Cotopaxi, there are high levels of fluoride in drinking water that exceed acceptable concentrations. Therefore, the population living in these areas can develop dental fluorosis, which is a pathology that alters the enamel, pigmenting the teeth with fine white lines and brown spots. This has serious repercussions on the appearance and health of people affected by the most severe levels. Therefore, the objective of this study was to evaluate the influence of fluorosis on the aesthetic self-perception of adolescents between 15-17 years of age, belonging to the San José de Guaytacama Educational Unit.

METHODS

Observational, descriptive, cross-sectional study, developed at the San José de Guaytacama Educational Unit, belonging to the Guaytacama parish, Latacunga canton, Cotopaxi province. Through non-probabilistic, intentional sampling, a sample of 192 participants was selected, who met the inclusion criteria (adolescents between 15-17 years old, belonging to the San José de Guaytacama Educational Unit, who present their parents' authorization to participate in the research) and exclusion criteria (adolescents with tetracycline stains or any other cause other than fluorosis, with the presence of severe periodontal diseases, or with any treatment that prevents or hinders the application of the microabrasion treatment).

Participants were invited and selected, informed consent was signed, measurements were taken and questionnaires were applied, which allowed obtaining information that led to the variables analyzed: age, sex, severity of fluoride opacity, and self-perception of dental aesthetics.

The severity of fluoride opacity was assessed using the Dean index, which is obtained by examining the vestibular surfaces of teeth 11, 12, 13, 21, 22 and 23 of each individual, for which a scale with numerical weight ranging from 0 to 4 was used. Where: 0 = normal; 1 = very mild; 2 = mild; 3 = moderate; 4 = severe (the tooth surface is severely affected, the tooth appears corroded). According to this index, the degree of dental fluorosis was determined, whose values range from 0 to 4.⁽¹⁰⁾

While the self-perception of dental aesthetics was evaluated by the Oral Health Impact Profile (OHIP-Esthetic) which is a questionnaire developed and evaluated by Wong et al., in 2007, it is a summarized version of the OHIP-49, it measures the self-perception of dental aesthetics from the impact of oral diseases, which consists of 14 questions and each of them presents 5 response alternatives: Never, Rarely, Occasionally, Very often, Always. The answers are based on a Lickert-type scale with a score from 0 (no impact on oral health) to 56 (worse oral health).⁽¹¹⁾ For the study, the level of impact of the self-perception of dental aesthetics was evaluated through the average obtained from the OIHP with integer values from 0 to 5, where 0 is null impact and 5 is high impact on aesthetic self-perception.

Statistical procedures

The collected data were systematized and tabulated in Microsoft Excel spreadsheets, then processed and analyzed in the SPSS (Statistical Package for Social Sciences) program. To determine the type of test to be used, the analysis of the normality distribution was performed through the Normality Test (Kolmogorov-Smirnov Goodness of Contribution to the Normal Curve) test. If the significance $p < 0,05$ the data do not follow a normal distribution and therefore tests for non-parametric variables (Sperman or Chi square) were applied; and if the significance $p < 0.05$ the distribution is normal and tests for parametric variables (Pearson) were applied.

Ethical aspects

This research was designed and carried out in accordance with the ethical principles for medical research involving human subjects, as established in the Declaration of Helsinki. The research was approved by the Scientific Council and the Ethics Committee of the institution in question. Each patient was explained the principle of voluntariness under which the questionnaire was applied. All patients were guaranteed the confidentiality of the information, which will be protected and will only be used for research or teaching purposes.

RESULTS

A total of 192 young people participated in the study, 51,6 % of whom were female. 36,5 % of the young people were 15 years old, 34,4 % were 16 years old, as shown in Table 1.

Table 1. Results of sociodemographic data analysis.

Variable		No.	%
Sex	Female	99	51,6
	Male	93	48,4
Age	15 years	70	36,5
	16 years old	66	34,4
	17 years old	56	29,2

From the clinical visual analysis, as shown in Figure 1, it was determined that a small fraction of young people have severe (4,69 %) and moderate (14,06 %) fluorosis, while a considerable percentage of young people have low levels of dental fluorosis: mild fluorosis level (19,79 %), very mild (25,0 %) and normal (36,46 %).

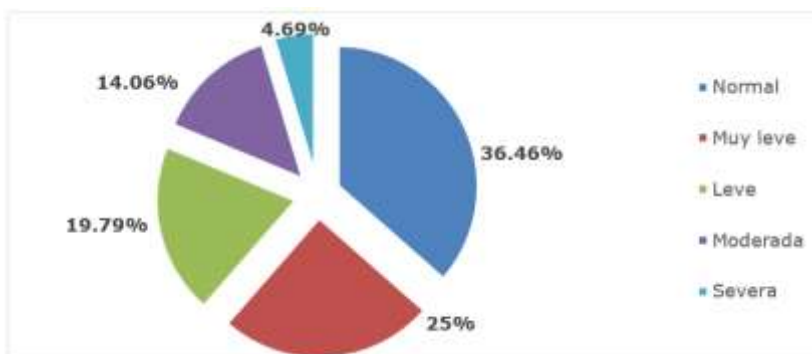


Fig. 1 Level of dental fluorosis identified in students.

There was no statistically significant relationship between aesthetic self-perception and age ($p=0.663$) or sex ($p=0.053$). On the other hand, the level of fluorosis presented by the patients was not related to aesthetic self-perception ($p=0.438$). Figure 2 shows the impact on aesthetic self-perception with fluorosis levels.

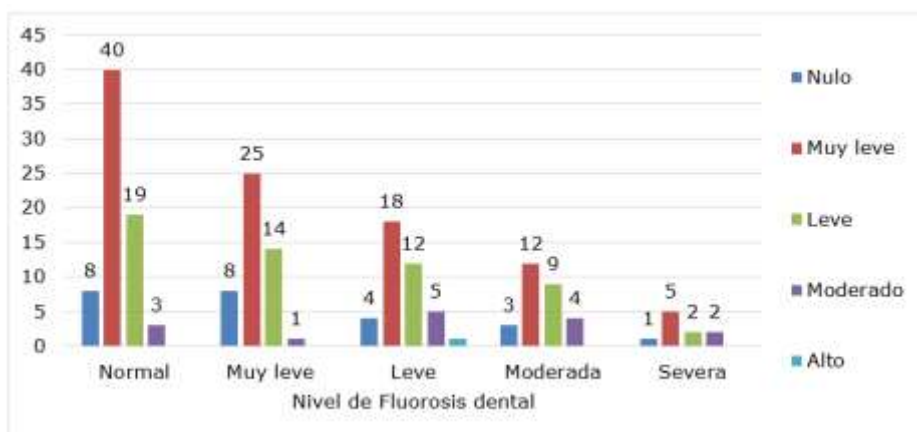


Fig. 2 Impact of dental fluorosis on aesthetic self-perception.

DISCUSSION

Nowadays, society has given a significant value to physical appearance, this can be seen in social networks and media; appearance today plays a very important role, it has become a social indicator of success, status and happiness.⁽¹²⁾ It is important to keep in mind that "the influence of the culture in which one lives and the values of society affect whether or not full personal satisfaction occurs."⁽¹³⁾

The fear of social rejection due to changes in the appearance of teeth that may be visible when smiling or speaking can be an important factor for self-confidence and self-esteem of adolescents; consequently, there is a high concern for the aesthetics of teeth.⁽¹⁴⁾ This is because young people are more sensitive to aesthetic imperfections, and self-esteem within this period is susceptible and vulnerable, which can negatively affect self-esteem.⁽¹⁵⁾

Dental aesthetics and facial appearance consider the smile as a substantial element that can greatly affect the way people perceive their overall attractiveness.⁽⁶⁾ According to studies, facial attractiveness plays a more important role than body attractiveness, where the smile is the second facial feature that people tend to notice for its attractiveness in others, therefore, dental aesthetics can generate a great impact on the attractiveness of a subject.⁽¹⁶⁾

Dental appearance has always been one of the parameters of social acceptance, as people tend to judge and be judged according to some characteristics of their personal appearance. How their teeth look and how their facial expression is is one of these, indicating whether one is attractive and healthy. Individuals with dental alterations such as dental malpositions, stains and color changes, especially in the front teeth, tend to have low self-esteem and feel ashamed of their appearance, and are also despised by those around them.⁽¹⁷⁾

Dental fluorosis directly affects dental aesthetics, leaving a before and after treatment for people who suffer from it, as they go from having a negative appearance to having an appearance that is totally acceptable to society. There are very few articles that have investigated the influence or impact of dental fluorosis on the aesthetic perception of adolescents, although there is information on how the presence of facial disharmonies and dental alterations influence the negative perception that others have of these people.⁽¹⁷⁾

Many of the participants in this study expressed that the bad position of the teeth is one of the main concerns in their self-perception of dental aesthetics and smile, presenting orthodontic treatment as the solution to these alterations to improve their integration within their groups and society. The perfect smile is the ideal demanded by all those young people who need to improve their facial appearance to please their classmates, friends and to have a better expression in their photos on social networks.⁽¹⁸⁾

This research determined that there is no relationship between the presence of dental fluorosis and the aesthetic perception of young people, even though the aesthetic changes are evident and marked in moderate and severe alterations of fluorosis. Given the frequency with which these alterations occur in the population that surrounds them, young people see it as something common that people around them from a young age have teeth that are whiter, yellower or have brown spots. In these places, dental fluorosis can even be considered an endemic disease caused by the high concentration of fluoride in the water for human consumption in the area and the inhabitants do not consider it an important dental disease. It is therefore recommended to carry out studies that analyze the relationship between the cultural environment and the appreciation of the facial aesthetics of people who suffer from dental fluorosis.

CONCLUSIONS

This study concludes that most of the population has fluorosis at levels ranging from mild to normal and by applying the Chi square test it was determined that there is no statistically significant relationship between the variables of aesthetic self-perception and the age and sex of the adolescents. Regarding the correlation between fluorosis and aesthetic self-perception of adolescents between 15-17 years of age from the San José de Guaytacama Educational Unit, it was determined that there is no statistically significant relationship between these variables. Although in the present study no statistically significant relationship was found between fluorosis and aesthetic self-perception of adolescents, this pathology can have a negative impact on the oral health and self-esteem of adolescents, since students with high levels of fluorosis run the risk of being classified as less attractive or healthy.

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