Evaluation of Oral Hygiene in Patients with Visual Disabilities
ORIGINAL

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Abstract

Introduction: Patients with visual impairment present greater difficulty in achieving adequate oral hygiene due to restricted eyesight. Therefore, oral hygiene motivation and instruction methods should be adapted to these patients to understand the importance of bacterial plaque control, both for the health of dental tissues and periodontal tissues.

Objective: The objective of the present study was to compare the plaque index (PI) of patients with and without visual impairment before and after the institution of oral hygiene instructions. Twenty patients with visual impairment (Group 1) from the Instituto dos Cegos and 20 without visual impairment (Group 2) from the ASCES Periodontia Clinic were selected. Data were collected through the PI of O'Leary and reevaluated every 21 days for four sessions.

Results: In both groups, the mean of PI decreased with the time of evaluation, with a significant difference between the evaluations (p <0.001). Group 1 had a mean PI higher than group 2 only in the fourth evaluation, but there was no significant difference (p> 0.05). As for the mean of the PI assessments, group 2 presented a mean higher than group 1, but without significant difference (p> 0.05).

Conclusion: The study therefore suggests that there is no difference in PI in patients with or without visual impairment, and that the guidelines stimulate and motivate an improvement in oral hygiene conditions.

Introduction

The process of infection and inflammation promotes the destruction of the protective tissues and support of the dental elements causing

periodontal disease. This process begins with an inflammation in the gingiva defined as gingivitis that tends to evolve to the destruction of the bones and tissues of dental support, periodontitis. Factors such as the individual's age, host response and plaque presence are related to the development of periodontitis [1].

The plaque control is done by removing the dental plaque in a regular manner preventing its buildup on the tooth and adjacent gingival surfaces. The dental professionals have a strong belief in the mechanical control of the plaque, daily cleaning with a toothbrush and other additional hygiene features as the most important means to achieve the benefits of oral health and to prevent periodontal disease in patients [2].

Patients with visual impairments present greater difficulty in carrying out adequate oral hygiene due to restricted eyesight. Therefore, oral hygiene motivation and instruction methods should be adapted to these patients to understand the importance of bacterial plaque control, both for dental and periodontal tissue health [3].

Thus, this study aimed to evaluate the removal of plaque using the plaque index of patients with visual impairment compared to patients without visual changes before and after the institution of instructions of mechanical oral hygiene with oriented brushing.

Materials and Methods

This study was of the type case-control with clinical and epidemiological characteristics. The studied population involved individuals of both genders between the ages of 15 and 55 years. The sample consisted of a random sample of forty patients, of whom twenty individuals (Group 1) came from the Institute of the Blind located at the Duque de Caxias State School - Caruaru/PE and twenty individuals (Group 2) were from the Dental Clinic Course Of Dental School of ASCES-Caruaru/PE. Exclusion crite-

ria were: patients using a fixed orthodontic appliance, oral antiseptics, patients who had less than 20 teeth in the oral and those who were taking any systemic medication on a regular basis and who did not agree to sign the Free and Informed Consent Form.

Data were collected through periodontal clinical examination as well as through a specific questionnaire. The examination was performed after the use of a 2% fuchsin-based evidentiary solution to show the dental biofilm, and O'Leary's plaque index (PI) was adopted [2]. This solution is able to stain the bacterial deposits on the surfaces of the teeth, tongue and gums. The application was performed with a cotton ball showing each tooth. After application of the evidentiary solution, the patient was instructed to rinse the mouth with water, and then each dental surface (except occlusal surfaces) was examined to verify the presence or absence of evidence of colored deposits in the cervical of the portion, four surfaces in each tooth. If present, plaques were recorded by coloring the appropriate face on a specific periodontal diagram. After marking records for each arch, the index was calculated by dividing the number of surfaces evidenced by the total number of teeth evaluated (number of teeth multiplied by four), and then dividing the dividend by 100, resulting in an average percentage.

After the first examination to collect the indices the patients were directed to perform mechanical plaque control through brushing directed to the gingival sulcus (oblique technique - Bass technique) described by Lascala [4]. To this end, all were given Colgate professional® brushes with soft bristles. The patients were re-evaluated every 21 days after the first examination in a total of four exams. There is no reinforcement of oral hygiene guidance at these times.

The data collected were entered in the Excel worksheet and analyzed statistically in the SPSS program (Statistical Package for the Social Sciences) in version 16.0. Statistical tests were used for statistical analy-

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sis: Student's t-test with equal or unequal variances and the F-test (ANOVA) were used to analyze the data. The statistical measures were: mean, standard deviation, minimum value and maximum value. For repeated measures with Bonferroni comparisons in case of significant differences between the evaluations (Inferential statistics techniques). It should be noted that the verification of the equality of variances hypothesis was performed using the Levene F test. The level of significance used in the statistical tests decision was 5.0% [5, 6], 95% confidence interval and study power of 80%.

This research was conducted in accordance with the precepts determined by resolution 196/96 of the National Health Council of the Ministry of Health and by resolution CFO 179/93 of the Code of Professional Dental Ethics. The work proposal was approved by the Research Ethics Committee - CEP of the Caruaruense Association of Higher Education - ASCES (Opinion 085-07 of November 14, 2007).

Results

In **Table 1**, it was observed that in the first, second and third evaluations the means of plaque index were correspondingly higher among patients in the group without visual impairment than in the visual impairment group, while in the fourth evaluation the average was higher In the group with visual impairment than in the group without visual impairment; (P> 0.05), the difference between the groups

Table 1. Statistics of the plaque index according to the evaluation and the group.

Group				
Statístic	Evaluation	With disability visual	Without disability	p₁ value
Mean	First	46.54(A)	51.55(A)	$p^1 = 0.371$
	Second	30.90(B)	36.96(B)	$p^2 = 0.186$
	Third	26.24(B)	26.99(C)	$p^2 = 0.872$
	Fourth	19.67(C)	19.15(D)	$p^2 = 0.891$
p₂ value	$p^3 < 0.001*$		$p^3 < 0.001*$	

Statístic	Evaluation	With disability visual	Without disability
Median	First	43.70	52.70
	Second	30.70	35.10
	Third	26.70	26.55
	Fourth	18.50	16.95
Standard deviation	First	20.80	11.75
	Second	14.41	12.82
	Third	15.97	11.82
	Fourth	13.38	8.71
Minimum	First	15.10	34.80
	Second	8.33	16.30
	Third	1.00	6.25
	Fourth	2.58	6.20
Maximum	First	88.70	75.00
	Second	66.60	56.80
	Third	55.17	47.00
	Fourth	50.00	43.10

*: Significant difference at the 5.0% level.
1: Through the t-Student test with unequal variances. 2: Through the t-Student test with equal variances.
3: Through the F (ANOVA) test for repeated measurements.
If the letters between parentheses are distinct there is a significant difference between the corresponding evaluations.

was higher in the second evaluation, followed by the difference in the first evaluation

In any of the groups the mean plaque index decreased with the time of evaluation, shown in **Figure 1**, thus proving the significant difference between the evaluations, through the paired comparison tests.

Figure 1: Evaluation of the plaque index according to the group: Group 1 (with visual impairment) and Group 2 (without visual change).

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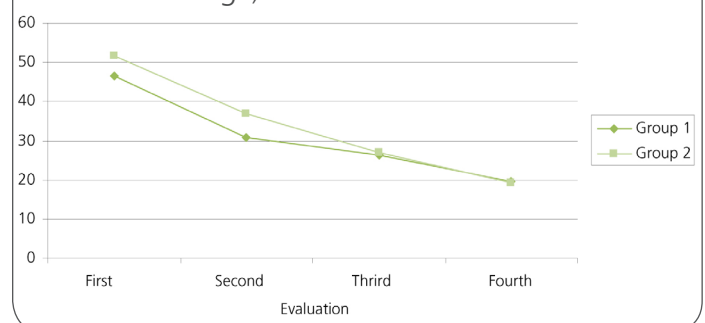**2017**

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Table 2 presents the plaque index statistics according to the group. This table shows that the mean was higher in the group without visual impairment than in the visually impaired group (33.67% vs. 30.84%); however, there was no significant difference between the groups in relation to the mean analyzed (P> 0.05).

Table 2. Statistics of the average of the indexes of the plaque index according to the group.

Statistic	Group		
	With disability visual	Without disability visual	value p1
Mean	30.84	33.67	p[1] = 0.453
Median	29.55	33.32	
Standard deviation	13.41	8.57	
Minimum	11.02	18.71	
Maximum	58.59	50.85	
[1]: Through the t-Student test with equal variances			

Discussion

It is evident through the literature that plaque is an essential factor for the development of periodontal disease, and there is a high correlation between plaque grade and periodontal disease [1, 7, 8].

The most common method for the control of dental biofilm is the mechanical removal done mainly by brushing and in addition to the use of dental floss, since the disorganization of the biofilm is a great key for prevention of oral diseases.

According to Gitirana et al, 2003 [9], "motivating patients to perform oral hygiene habits has always been a challenge for dentistry", being an even greater challenge in patients with visual impairment, since they present difficulties in performing this hygiene due to the restriction of Vision [10]. In the study conducted by Gitirana et al, 2003 [9] with children 4 to 5 years of age, the initial index was 77.7% and at the end of the study the results finished with an average of 20.5%, with a notable reduction in plaque index values.

In the present study, it was verified that through the practice of oral hygiene and platelet examination, there was a decrease in the initial values of the plaque index in both the visually impaired group (Group 1) with 46.5% and in the Group with no visual change (Group 2) with 51.5%, ending with 19.6% and 19.1%, respectively.

The researchers also found that the indices of the first consultation in both groups were high, as they had not yet received any guidance regarding oral hygiene. Since the second consultation, these indexes have been decreasing, one can certainly attribute to this the instructions given to the patients who received the necessary motivation to modify their hygiene habits.

According to some authors [9, 11, 12] the motivation and the incentive to oral hygiene, decrease the indexes influencing the susceptibility to caries and periodontal disease.

In the study carried out by Sousa, 2004 [13], it was observed that the visible plaque index (IPV), in 61 students of Group 1, 45.9% decreased the values between the initial and final exam; 37.7% maintained the same index and 16.4% increased the values of the dental biofilm index between the exams. Already in the 74 students of Group 2, a reduction of 100% in the visible plaque index was observed between the initial and final exam, and 58% of the students reached zero visible biofilm index. Still in relation to this index, when comparing the two intervention groups, we observed a statistically significant difference (p <0.001) and we can perceive this same relation with the patients of the groups researched in our investigation. The role of oral health education as a preventive measure is as important as clinical measures, and if there is no motivation it will be difficult to change the attitude of patients and parents and/or caregivers [14, 15].

Another finding from the present study found that for both adults with disabilities and adults without visual impairment there was a decrease in

the indexes of results, similar to that found by Pontes [14] with undergraduate dentistry students from University of Fortaleza, where they already had a degree Information.

In the study conducted by Teitelbaum [16] with patients with Down's Syndrome, there was also a significant reduction in plaque index, despite the motor and macroglossia difficulties involved in the removal of the plaque, contributing to the installation of periodontal disease.

The Brito study [17] with special patients showed that the mean plaque index at baseline was high, similar to our findings and that after the motivation there was an improvement in this index. For the author, the group of patients that did not present good results were those who were totally dependent.

Conclusion

The results obtained suggest that there is no significant difference in plaque index in patients with visual impairment or without disability, considering before oral hygiene orientation and after the monitoring period.

The plaque index levels were reduced in both groups after the orientation and monitoring program;Although the main focus of this study was the comparison between the groups, hygiene guidelines, systematic monitoring and professional control promoted a gradual and significant reduction of plaque index levels, improving oral hygiene conditions.

Conflict of Interest

No potential conflict of interest relevant to this article was reported.

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