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Periodontitis in early age patients with intellectual disabilities in Cuenca – Ecuador an observational cross- study.

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Abstract

Periodontitis in early age patients with intellectual disabilities in Cuenca – Ecuador an observational cross- study.

Aims & Background: *It is recognized that currently, both dental caries and periodontal diseases induced by biofilm are highly prevalent worldwide. Intellectual disability is a condition that places the individual in a vulnerable situation when it comes to oral health, especially for implementing adequate oral hygiene techniques. Considering the fact that oral disease represents an important health problem, scientific evidence shows a high prevalence of caries and periodontal disease in patients with intellectual disabilities. However, it is also recognized that studies on this type of vulnerable population are scarce, and oral health studies often exclude patients with disabilities. In Ecuador, the percentage of people with intellectual disabilities has been reported at 23.12%. Of this total, 27.83% correspond to individuals in early childhood and adolescence (0-18 years old). However, the data associated with oral health are limited or null, therefore, generating preventive policies remains uncertain. The aim of this study is to determine the prevalence of periodontitis in early-age patients with intellectual disabilities in a group of 151 students from educational institutes for intellectual disabilities in Ecuador.*

Materials and Methods: *A human observational cross- study with a sample non- probabilistic for convenience with subjects with intellectual disability and age between 3 and 20 years old of both sexes who attend the Azuay Special Educational Unit and the San José de Calasanz Basic Education School. For the data collection, forms were used to collect information on the student's affiliation, medical history, socioeconomic level, daily oral hygiene practices, and informed consent and was filled out by the subject's parents/guardians. A clinical record was used to record clinical data on periodontal health and oral hygiene. Statistical analysis was performed using the statistical package SPSS version 22, applying descriptive statistics.*

Results: *Among the 141 evaluated, 52% were males and 48% female. The hygienic state of the patients in all cases was deficient. A diagnosis was obtained in 10.64% of healthy patients, 60.28% of patients with gingivitis and 29.07% with different severities of periodontitis. Within the cases of periodontitis, the majority was concentrated in a mild severity followed by moderate periodontitis. Only 2 subjects were diagnosed with severe periodontitis.*

Conclusion: *This research showed that early age patients with intellectual disabilities presented periodontitis at different levels, the intellectual disability could be conditioning in different aspects the rapid development of this disease and probably is linked on the type of disability and socioeconomic aspect.*

Clinical significance: *The data provides a real perspective of periodontal health of subjects at an early age with intellectual disabilities in Cuenca - Ecuador, results that can be translated into prevention and public health policies for these vulnerable subjects.*

Keywords: *Intellectual disabilities, oral health, observational study, periodontal disease, periodontitis.*

INTRODUCTION

It is recognized that currently both dental caries and periodontal diseases induced by biofilm are highly prevalent worldwide, with periodontitis being the one that leads to tooth loss and a possible impact on quality of life.[(1)] Even though they are multifactorial diseases, the biofilm is identified as the main etiological factor. However, it is known that prolonged exposure to the etiological factor implies a greater risk of developing the disease so adequate control of the bacterial component from an early age is of the utmost importance for its prevention.[(2)] Intellectual disabilities (ID) are characterized by alterations in behavior and cognitive skills that condition their social relationships, self-care, and development of cognitive motor skills.[(3)] ID is a condition that places the subject in vulnerability when it comes to oral health, this is due to different circumstances such as cognitive deficiencies, motor deficiencies, behavioral disorders, medications, oral anomalies, alteration in production salivary, dietary factors, among other.[(4, 5)] These conditions expose the individual to developing learning difficulties, as well as difficulties in manual dexterity when implementing adequate oral hygiene techniques.[(6)] Therefore, their intellectual condition could have a significant impact on the control of the biofilm placing them in a place of vulnerability for the development of these highly prevalent diseases.[(6, 7)] In addition, it is known that the

socioeconomic level could have a significant influence on the manifestation of these diseases.[8]
Although gingivitis is the most prevalent disease worldwide it is considered the prelude to periodontitis, which, although its prevalence is higher in older adults, permanent exposure to the etiological factor due to added conditions would mean its early appearance and with it, a high risk of dental loss, condition that would affect the quality of life.[9]
According to the Pediatric Dental Academy, children with developmental disabilities often have complex unmet health care needs, as well as significant physical and cognitive limitations.[10] Early age people with more severe conditions and from low-income families are particularly at risk of oral problems coupled with limited access to dental care.[4] This ratifies the fact that oral disease represents an important health problem among people with disabilities. It is evident that the oral health problems of these schoolchildren are more complex, even more so when the general characteristics of this group are unknown.[8]
Scientific evidence shows a high prevalence of caries and periodontal disease associated with poor oral hygiene, a recognized etiological factor for both diseases. Anders[6] and Campanaro[18], indicated that there is a high prevalence of periodontal disease in patients with ID, although it is also recognized that studies on this type of vulnerable population are scarce, and oral health studies often exclude patients with disabilities. If the focus is on prevention policies, these remain insufficient. In Ecuador, the percentage of people with ID as of October 2021 was reported to be 23.12%. Of this total, 27.83% corresponded to individuals in early childhood (0-18 years). However, the data related to oral health are scarce or nonexistent; therefore, generating preventive policies remains uncertain.[11]
The aim of this study is to determine the prevalence of periodontitis in early-age patients with intellectual disabilities in a group of 151 students from educational institutes for ID in Ecuador testing the hypothesis that subjects with intellectual disability from an early age could manifest periodontitis in different levels of severity.

METHODS

Sampling and Data Collection

The sample was non-probabilistic and for convenience since it was a select group of patients with specific conditions. All subjects with intellectual disability and age between 3 and 20 years old were invited to participate in this human observational cross-sectional study. The sample consisted of all disabled schoolchildren of both sexes who attended the Azuay Special Educational Unit and the San José de Calasanz Basic Education School. The schoolchildren included were those whose legal guardians consented to their participation in the study and met the inclusion criteria (schoolchildren diagnosed with ID, schoolchildren with acceptable cooperation and schoolchildren with informed consent signed by their legal representatives).
For the data collection, researchers trained in behavior management and calibrated in clinical criteria were used, achieving a Kappa index agreement value of 0.80. Forms were used to collect information on the student's affiliation, medical history, socioeconomic level, daily oral hygiene practices, and informed consent, which were filled out by the subject's parents/guardians. A clinical record was used to record clinical data on periodontal health and oral hygiene.

Technical procedures

The students were divided into four groups: 1) students with mental retardation, 2) students with Down syndrome, 3) students with autism, and 4) students with other ID. The following age ranges were established: 3-6.11 years; 7-10.11 years old; 11-14.11 years old, and 15-20 years old, and each group was categorized by gender. For the socioeconomic level, it was categorized: A= HIGH income between US$845 - US$1000, B= UPPER MIDDLE income between US$691.1 - US$845, C+= MIDDLE income between US$535.1 - US$696, C-= LOWER MIDDLE income between US$316.1 - US$535 and D= LOW income between US$0-US$31.

Variables Measured

The periodontal clinical examination was performed in a dental chair with artificial light, a mouth mirror, and a North Carolina periodontal probe, cotton forceps, cotton swabs, and a two-tone plaque developer were used. The data obtained were recorded in the periodontogram designed for this purpose. It began with the assessment of oral hygiene using the O'Leary index (1972), which indicates the percentage of smooth stained surfaces over the total dental surfaces present. The results are obtained with the formula: number of stained surfaces/number of analyzed surfaces x 100. Indicators: Acceptable = 0 – 12%; Questionable = 13 – 24%; Deficient = 25% and up.
For the diagnosis of Periodontitis, in the first instance, the presence of bleeding on probing was assessed, followed by the probing depth and the loss of attachment level. The analysis was carried out on each dental tooth. Criteria:

1 = Positive Bleeding, 2 = Periodontal Pocket, 3 = Attachment Loss. Indicators: a. Healthy: no bleeding or positive bleeding <10% without periodontal pocket and attachment loss; b. Gingivitis: positive bleeding >10% without periodontal pocket and attachment loss; c. Periodontitis: positive bleeding, periodontal pocket, and attachment loss with different severity: 1. Mild severity: attachment loss of 1 to 2 mm, 2. Moderate: 3 and less than 5 mm, 3. Severe: > 5 mm (bleeding and bag). Extension: <30% of affected surfaces localized, and >30% generalized.

All the participants were educated on the importance of oral hygiene, accompanied by dental prophylaxis and fluoride application. Finally, workshops on oral health education were given to parents, guardians and teachers. The study was not an intervention, so there was no risk to the health of the students, and it also had the approval of the Ethics Committee of the Central University of Ecuador, as well as the informed consent signed by the representatives.

Analysis

Statistical analysis was performed using the statistical package SPSS version 22, applying descriptive statistics. The percentage prevalence of periodontitis in the group and by type of disability was obtained. The analysis of the quantitative variable was carried out by means of the Student's t-test for one sample and for two independent samples, and for the qualitative variables by means of the difference of proportions, using the Chi-square test with a $p \leq 0.05$ for statistical significance. Models were checked for age and gender.

RESULTS

Among the 161 subjects that agreed to participate, 20 could not be evaluated for reasons of desertion (absence from school for long periods, lack of cooperation, no show on the examination days, or medical treatment), resulting in a 92.72% response rate. Among the 141 evaluated, 52% were male and 48% female. Despite categorizing them into four groups according to the most frequent type of disability, no subjects with any other type of disability other than Down syndrome, autism, or ID were reported. Likewise, no subject was diagnosed with profound intellectual disability. The demographics, type of disability, hygienic status, and socioeconomic level are described in Table 1.

The periodontal examination was completed for the 141 subjects studied, among whom a diagnosis was obtained in 10.64% of healthy patients, that is, those without bleeding or bleeding less than 10% without periodontal pockets or attachment loss. Likewise, 60.28% of patients were diagnosed with gingivitis. Although few subjects were diagnosed with periodontitis (n = 41/ 29.07%), different severities were found. Mild periodontitis was diagnosed in 31 subjects, all of whom had localized extension, followed by 8 with moderate periodontitis, one of whom had generalized extension. Only 2 subjects were diagnosed with severe periodontitis. Regarding the distribution of periodontal disease and type of disability, it is detailed in Table 2.

DISCUSSION

According to the data found in the clinical survey of the San José de Calasanz and UNEDA schools, in a sample of 141 participants between the ages of 3 and 20 with different ID, the presence of periodontitis can be seen, confirming the hypothesis of the presence of periodontitis in patients with ID at an early age. Taking into account that this condition entails tooth loss and the possible association with systemic conditions[12] it could be assumed that the sooner it occurs, the consequences could be more serious. Therefore, the key factor in its presence in early-age patients may be ID, which affects those who suffer from self-care, motor, and learning difficulties, relevant aspects when it comes to controlling biofilm.[13] In this study, it was observed that most children had deficient oral hygiene, which corroborates the results found in different studies that confirmed that children with ID had significantly higher levels of dental biofilm.[14] For this reason, oral hygiene interventions should be the focus of prevention; however, the evidence suggests that strongly supported recommendations are not yet available as a key hygiene approach for patients with ID.[7]

According to the results found in this study, the difference between the types of ID does not seem to be relevant, since they are organized according to the size of the sample when classifying by different conditions. Regarding the socioeconomic level, it is evident that those who have fewer resources and, therefore, difficulties in accessing education, health care, among others, could have a significant impact when considering modifying or aggravating factors of the disease, as seen in other studies.

Regarding periodontal clinical analysis, in accordance with other studies, the most prevalent condition in this age group is gingivitis.[15] However, the presence of periodontitis at different levels at an early age was observed, and the majority manifestation was mild periodontitis in 75.61%, similar to the study carried out by Sakellari et al., indicating that intellectual disability influences the presence of periodontitis at an early stage, leading to

premature periodontal destruction.[16, 17]
Another factor to consider is the quality of life of subjects suffering from ID, since it has been shown that oral conditions can affect their quality of life.[2, 14]

CONCLUSION

This research showed that early onset patients with ID presented periodontitis at different levels. This suggests that, even though periodontal disease is typically associated with a long-standing chronic evolution, which is more common in elderly patients, the condition of intellectual disability could influence the rapid development of this disease. Depending on the type of disability, it could be even more prevalent. The results in this study indicate the highest percentage of prevalence in patients with Down syndrome, followed by patients with ID. Therefore, new studies would be required to consolidate these data and to clarify the links associated with each condition, as well as new clinical trial studies on preventive and therapeutic actions.

Clinical significance

The data provided by this study offers a real perspective of the periodontal health of subjects at an early age with intellectual disabilities in Ecuador, results that could be used to inform prevention and public health policies for this vulnerable group.

Abbreviations

Intellectual Disabilities (ID).

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