

CONTRIBUTIONS ON THE INCIDENCE OF DENTAL CARIES BY ASSESSING THE SIC INDEX

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ABSTRACT

The purpose of this study was to emphasize the importance of identifying individual risk factors in the occurrence of dental caries as early as possible, thus following the development of a personalized prevention plan.

The study was conducted on a group of 30 people aged between 12-20 years. Each patient was informed about the procedures and the caregivers signed informed consent and approved the processing of personal data and the use of their data for the study.

A multiple regression analysis was performed using the values of the CAO-D and CAO-S indices as dependent variables, and the values of the DI, CI, OHI, diet score indices as independent variables.

In the multiple regression analysis for the comparative analysis of the value of the dependent variable of the CAO-D index and the frequency of daily sweets consumption, we obtained an ascending linear direction of the association of the two variables. This signifies a positive association of the dependent variable and the independent variable.

Key words: individual risk factors, tooth decay, regression analysis

INTRODUCTION

The aim is to highlight the degree of caries involvement at the population level and the severity of the population's dental condition, so that preventive population strategy programs can be implemented.

MATERIALS AND METHODS

The study was carried out on a group of 30 persons aged 12-20 years.

Each patient was informed about the procedures and the guardians signed informed consent and approved the processing of personal data and the use of their data for the

study.

In the first session, we conducted the clinical examination of the patients which included the collection of personal data and the preparation of the observation chart

A thorough dental examination was performed with calculation of caries indices CAO-D, CAO-S, as well as SIC fraction for CAO-D and CAO-S.

Then 1/3 of the group with the highest values of CAO-D, CAO-S and CAO-C caries index was selected and the mean value of the caries index for this group was realized, thus

obtaining the SIC-D and SIC-S index value.

Thus, the assessment of oral health and CI, then calculating the oral hygiene index OHI by summing them.

All collected data were then centralized and statistically examined using Microsoft Excel.

A multiple regression analysis was performed using the values of the CAO-D and CAO-S indices as dependent variables and the values of the DI, CI, OHI, diet score as independent variables.

RESULTS AND DISCUSSIONS

For the caries index CAO-D we obtained a mean value of 4.10 ± 2.07 and for the caries index CAO-S we obtained a mean value of 4.73 ± 2.71 .

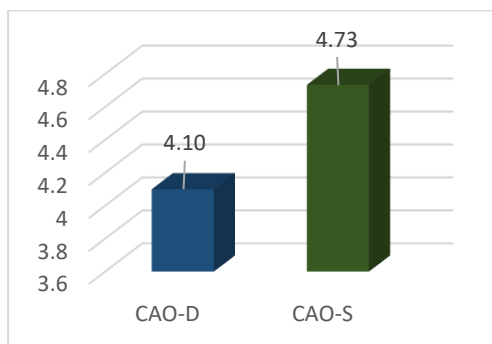


Figure 1 Dental caries index

We calculated the mean value of the bacterial plaque index DI for which we obtained a value of 1.8 ± 0.84 , and the mean value of the dental calculus index for which we obtained a value of 1.3 ± 0.95 .

We obtained an oral hygiene index value of 3.1 for the group of patients considered for the study, which is an unsatisfactory score in terms of the oral hygiene level of the patients.

We further calculated the SIC values for the caries indices CAO-D and CAO-S, and also the SIC index value for the oral plaque index DI, the dental calculus index CI and the oral hygiene index OHI.

hygiene was performed by calculating the plaque index DI and the dental calculus index

We obtained mean values of SIC-D= 6.4 ± 1.34 , and SIC-S= 7.7 ± 1.88 .

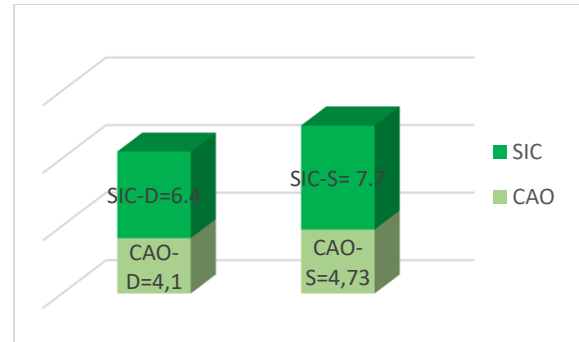


Figure 2 CAO and SIC caries indices

A rather high SIC index value for the CAO-D of 6.4 compared to the average CAO-D index value of 4.1.

Also, the SIC-S index value calculated for the CAO-S caries index was 7.7, a high value compared to the CAO-S index value of 4.73.

This proves once again that by calculating the SIC index, it will highlight that sequence of the group that has the highest prevalence of dental caries, thus having the possibility to take personalized preventive measures. [7]

It will be assessed for each of these patients which are the risk factors, and especially the predominant risk factors so that specific measures can be adopted according to the needs of each patient [6].

Therefore the oral hygiene index will also be calculated by calculating the plaque index DI and dental calculus index CI. The value of oral hygiene index OHI was obtained.

For the OHI index value the SIC index was then calculated, calculated for that third of the group that had the highest CAO caries index value.

This was done to identify the degree of hygiene for this fraction of the study group.

We tried to appreciate the degree of comparison between the level of dental caries and the degree of oral hygiene for these

patients, whether we can find an association between the risk factors in the occurrence of dental caries, oral hygiene, and the incidence of dental caries [8].

For bacterial plaque index DI the mean value was 1.8, while the SIC value for DI was 2.6, which was high compared to the mean value of the whole group.

For the dental calculus index CI the mean value was 1.3, while the SIC value for CI was 2.3, also a high value compared to the mean value of the whole group.

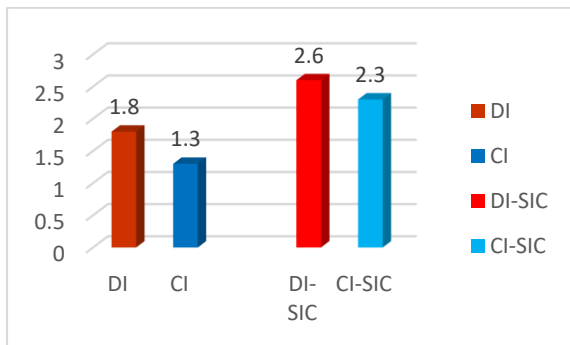


Figure 3 Values DI, CI, DI-SIC, CI-SIC

It should be noted that for the CIS group with the highest values of the caries index, we also obtained higher values of the DI, bacterial plaque index, and CI, dental calculus index.

This result may suggest that there are risk factors for dental caries in CIS group patients, represented by poor oral hygiene and thus increased plaque levels.

The low level of oral hygiene leads to an increased microbial load, which causes the pH to drop below the critical level, leading to demineralization processes.

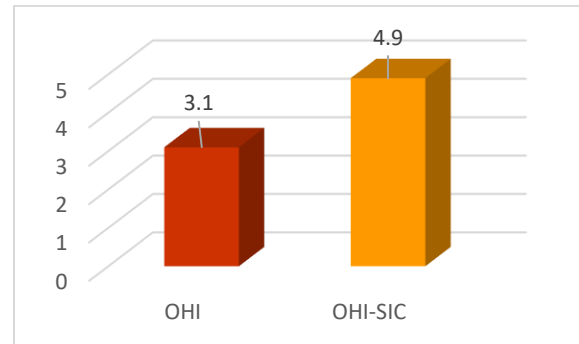


Figure 4 Oral hygiene index values

The overall mean value for the whole group of the oral hygiene index OHI was 3.1, calculated by summing the values of DI=1.8, plaque index, and CI=1.3, dental calculus index.

Also for this index the SIC fraction was calculated for the SIC group of patients with the highest caries index values. Thus the OHI-SIC value was calculated by summing the values DI-SIC=2.6 and CI-SIC=2.3, and we obtained the value 4.9.

It is also observed that the values obtained for the plaque index DI, dental calculus index CI, and oral hygiene index OHI, the SIC fraction has a significantly increased value compared to the mean value of the respective indices.

An analysis of the association between the two variables was performed, with a pair of scores measured for each sample member.

A correlation was observed between increasing values of the CAO-D dental caries indices and increasing values of the DI plaque and CI dental calculus indices.

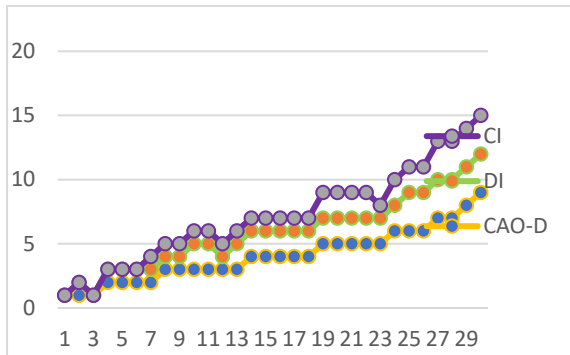


Figure 5 Correlation between CAO-D index, DI index and CI index

Also, there is a significant proportional correlation between the increasing values of the dental caries index CAO-S and the values of the indices DI and CI. So, the higher the value of the caries index, the higher is the value of the oral hygiene index for a subject.

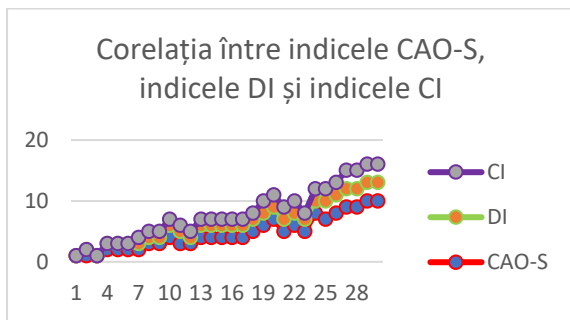


Figure 6 Correlation between EAC-S index, DI index and CI index

There is a linear upward direction of the association, which means a positive association of the two variables.

These statistically significant correlations between the values of the dental caries and oral hygiene indices signify a correlation between the risk factor, oral hygiene and the occurrence of carious processes.

Regarding diet as an independent variable considered for the multiple regression analysis, we collected information in the initial questionnaire, each patient recording the frequency of daily consumption of

sweets.

For the whole group of patients, we obtained a mean value of 6 times per day of sweets or juices intake, while for the CIS fraction of patients we obtained a mean value of 8 times per day of sweets or juices intake.

In the multiple regression analysis for the comparative analysis of the dependent variable value of the CAO-D index and the frequency of daily sweets consumption, we obtained a linear upward direction of the association of the two variables. This signifies a positive association of the dependent variable and the independent variable.

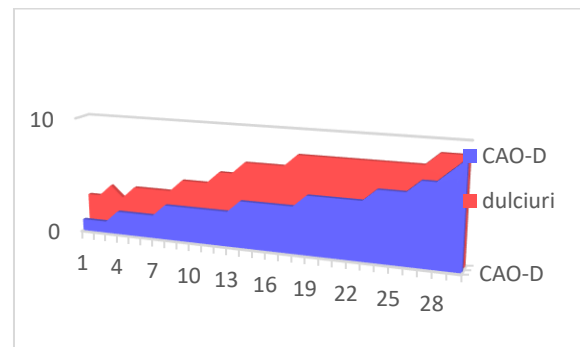


Figure 7 Correlation between the CAO-D index and sweets consumption.

So there is a correlation between the frequency of sweets consumed in a day and the prevalence of tooth decay.

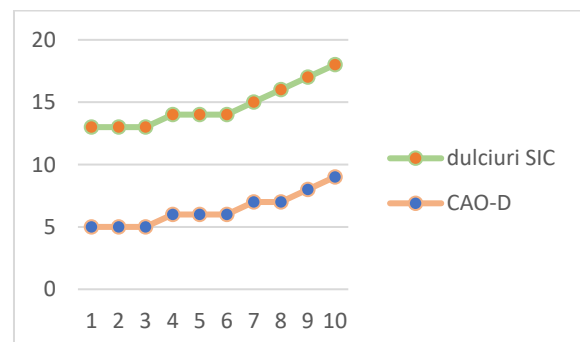


Figure 8 Comparison of CAO-D SIC values and frequency of sweets consumption

A multiple regression analysis was also performed between the values of the dependent variable of the CAO-S dental caries index and the independent variable of the frequency of sweets consumption during the day.

Again, we obtained a linear upward direction of the association of the two variables, which means a positive association.

Thus, there are statistically significant correlations between the values of the two variables, so the higher the value of the dental caries index, the higher the frequency of sweets consumption.

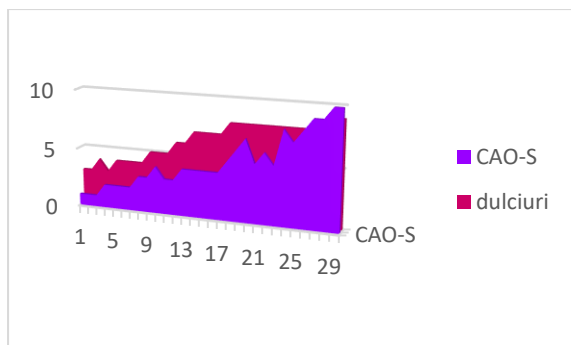


Figure 9 Comparison between the CAO-S index and sweets consumption.

For the value of the CAO-S index, a positive association was obtained with the value of sweets intake, there being a statistically significant correlation of the values of the two variables, especially for the SIC fraction of the two variables ($p < 0.05$).

So the higher the frequency and quantity of sweets consumption during the day, the higher the number of carious processes.

This emphasizes the role of dietary risk factor in the occurrence of dental caries. It is important to appreciate the degree of involvement of each risk factor in the development of dental caries in order to

assess the need for treatment and to draw up a personalized prevention plan for each patient.

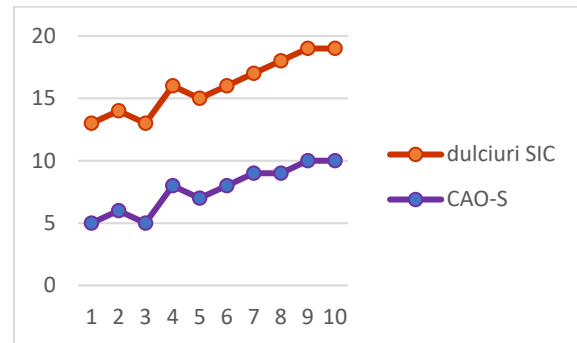


Figure 10 Comparison between the CAO-S SIC index and the frequency of sweets consumption.

For both the CAO-D and CAO-S indices, a positive association was obtained with the frequency of sweets consumption, indicating a correlation between the degree of dental caries damage and the frequency of carbohydrate intake [11].

Similar results were obtained in other studies conducted in Romania [16].

The presence and evolution of carious processes is also influenced by the existence of endocrine or metabolic diseases [17-22].

CONCLUSIONS.

1. CIS index assessment, as the fraction of the population with the highest prevalence of dental caries, can be used to highlight increased caries risk and special prevention needs [23, 24].
2. Comparison of the dental caries indices with oral hygiene and dietary habits allow to assess the degree of risk for dental caries and to highlight risk factors with the implementation of personalized prevention and treatment plans.

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