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Risk factors associated with caries and periodontal disease in a Center of Special Basic Education in Huánuco, 2017

Factores de riesgo asociados a caries y enfermedad periodontal en Centro de Educación Básica Especial de Huánuco, 2017

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Abstract

Objectives: to identify the risk factors associated with caries and periodontal disease in children from 7to18 years of age in the Center of Special Basic Education "Niño Jesús de Praga" in Huánuco 2017. **Materials and methods**: observational, Analytical Design of cases and controls. A survey-type collection sheet was used. The sample was constituted of 60 special children (study group) and 60 non-special children (control group). Dependent variable: caries and periodontal disease (because they are the most frequent disease in the oral cavity). Independent variables: oral hygiene index, labor time, complication during pregnancy, salivary pH, carbohydrate intake and type of labor. **Results**: among the risk factors for caries and periodontal disease, there is no statistically significant difference ($p < 0.05$) with the labor time, nor the other factors. The following factors were determined as risk factors for caries: Oral hygiene index, labor time and complications during the pregnancy; and risk factors for periodontal disease: salivary pH, carbohydrate intake and type of labor. Furthermore, no significant differences ($p > 0.05$) were found between the DMFT+ dft index for caries (p: 0.36) and the CPITN index for periodontal disease (p: 0.89) for both groups. **Conclusions**: We found a significant difference between labor time and caries and periodontal disease that affect both groups. The risk factors were found specifically for caries and periodontal disease that are not as widely used for these oral diseases in both groups and no significant difference was found between the used indexes.

Keywords: dental caries, periodontal diseases, risk factors (MeSH source NLM).

Resumen

Objetivos. Identificar factores de riesgo asociados a caries y enfermedad periodontal en niños de 7-18 años de edad en Centro de Educación Básica Especial "Niño Jesús de Praga" Huánuco 2017. **Materiales y métodos**. Diseño Observacional, Analítico de casos y controles. Empleándose ficha de recolección tipo encuesta. Muestra de 60 niños especiales (grupo de estudio) y 60 niños no especiales (grupo control). Variable dependiente: caries y enfermedad periodontal (con etiologías más frecuentes en cavidad oral). Variables independientes: índice de higiene oral, tiempo de parto, complicación durante la gestación, Ph salival, ingesta de carbohidratos y tipo de parto. **Resultados**. Entre los factores de riesgo para caries y enfermedad periodontal, no existe diferencia estadísticamente significativa ($p<0,05$) con el tiempo de parto, ni los otros factores Se determinó como factores de riesgo para caries: Índice de higiene oral, tiempo de parto y complicación durante la gestación; y factores de riesgo para la Enfermedad periodontal: Ph salival, ingesta de carbohidratos y tipo de parto. Además, no se encontró diferencias significativas ($p>0,05$) entre los Índices CPOD+ceod para caries (p: 0,36) e índice INTPC para enfermedad periodontal (p: 0,89) para ambos grupos. **Conclusiones**. Encontramos diferencia significativa entre el factor Tiempo de parto y la caries y enfermedad periodontal que afectan a ambos grupos. Se encontró factores de riesgo específicamente para caries y enfermedad periodontal que no son tan usados para estas enfermedades bucales en ambos grupos y no encontrándose diferencia significativa entre los índices usados.

Palabras clave: caries dental, enfermedades periodontales, factores de riesgo (DeCS fuente

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2616-6097/©2020. Peruvian Journal of Health Research. This is an Open Access article under the CC-BYlicense (https://creativecommons.org/licenses/by/4.0). It allows copying and redistributing the material in any medium or format. You must give credit appropriately, provide a link to the license, and indicate if changes have been made.

Introduction

The World Health Organization specified that the children with developmental deficiencies or alterations should be detected and cared for early (1), concluding that the multi-causality of disability and the complexity of the various factors that interact to produce disability, push us to the search and the identification of approaches and strategies that allow giving comprehensive responses embedded in the public programs and policies about the care for people with disabilities, their rehabilitation and social integration, especially mainstreaming the issue in all development initiatives that lead to human well-being (2).The Ministry of Health does not yet have official medical records about which is the most prevalent oral disease in special children with respect to the risk factors for caries and periodontal disease.

Shapira et al. (3) conducted a research in the Israeli population with children to aged 11 years and adults with an average age of 22 years, in which they found that special adults had severe periodontal problems that even required periodontal surgery and to the average of the teeth with caries, or to were lost them and restored was considerably less than

the normal adult population; in the case of the special children, these showed a caries index similar to that of the non-special population and the need for periodontal treatment.

The research in Belgium about special children found that there is no significant difference in the experience of caries with the normal population (4).

A research carried out about the oral pathology prevalent in the exceptional children in Venezuela, found that the special children have a high prevalence of caries and malocclusions compared to other pathologies such as Down syndrome, Deaf-mute, Cerebral Paralysis and it was only overcome by the blindness (5). With which they concluded that it is essential to take oral health actions in the face of these problems in the groups at highest risk such as autism and the blind in order to provide an effective solution to their oral pathologies and thus improve their quality of life.

Beck (6) affirmed that a risk factor is an environmental, behavioral or a biological factor confirmed by a time sequence which, if it occurs directly, increases the probability that the disease will occur and, in its absence, reduces this probability.

Jenkins and Papapanou (7) found that gingivitis is the most common condition, its prevalence, severity and extension increase with the age, beginning in the primary dentition, until reaching its peak in puberty followed by a small decrease in the adolescence. The limited information available regarding periodontitis in the primary dentition points to a prevalence in children of European origin of approximately 5%. Generally, few sites are affected and the amount of loss of union is inconsistent (8). The diseases of the dental caries and the periodontal disease are complex pathological processes of infectious and transmissible origin that affect soft and dental structures characterized by a biochemical imbalance: which causes cavitation and alterations of the dentin pulp complex (9).

This research pretend delimitate the bases for identify the behavior of these risk factors that lead to these oral diseases in this human group with special needs, which currently has various controversies, even in the same medical diagnostic, which for many researchers is in the process of being clarified.

According with the scientific evidence these patients have a high risk of dental caries and periodontal disease, especially in childhood, due to the preference to they have for the consumption of sticky and sugary foods; that in addition to the poor oral hygiene, behavioral disturbances, gastrointestinal deficiencies such as: poor digestion, malabsorption, esophageal reflux, enzyme deficiencies, gastritis, metabolic deficiencies along with motor and immune deficiencies, especially at the lymphocyte level; these characteristics of the disease, they make the special child be a particular care patient in relation to the dental treatment, with the prevention being the way of choice when treating this type of patient (9).

The research had to be carried out in a suitable place that has reliability and it is rigorous and consistent in the data (which is based in the objective reality). Therefore, the objective of the present research was to identify the risk factors that cause dental caries and periodontal disease in children from 7 to 18 years old in the Center of Special Basic Education “Niño Jesús de Praga” from Huánuco, 2017.

Materials and methods

Type of study

The type of the study was quantitative, the design of cases and controls. The design that was applied in this research work was the Observational, Analytical Design of cases and controls because a group of the children with special characteristics (study or cases) was compared with a group of children who did not present these characteristics (controls).

Study variables

The variables studied are: Dependent variable: Dental caries and Periodontal disease (defined as the two most frequent etiologies in the oral cavity associated with the accumulation of bacterial plaque). Independent variable: Risk Factors for caries and periodontal disease (such as oral hygiene index (OHI), labor time, complication during the pregnancy, salivary pH, carbohydrate intake and type of labor).

Population and sample

The population was constituted by all the students old to the Center of Special Basic

Education “Niño Jesús de Praga”, reaching a total of 140 children. The sample size was 120 children. The sample was calculated using the non-probability sampling type for convenience, so that external factors do not intervene. Therefore, the sample consisted of special children between 7 to 18 years old, grouped into two groups, 60 special children for the study group and 60 non-special children for the control group.

Procedures

The selected children had a psychiatric medical diagnosis of the disorder and also had siblings within the study ages.

For the study procedure, the group of special children and non-special children met on a preset day and time in the Center of Special Basic Education “Niño Jesús de Praga”. The form was completed starting with the affiliation data that was consulted with the parent or guardian of each child. For the data collection, dental caries and periodontal disease indexes were used:

- Index for Dental Caries (DMFT+dft) for the primary and permanent dentition.
- The community periodontal index of treatment needs (CPITN).
- Parameters for the evaluation of risk factors for caries and periodontal disease.

Data analysis

For the data processing, an inferential statistical data analysis was performed using the Chi Square test employing the SPSS 15 statistical program to be able to tabulate the statistical data from the research results. These results were grouped into contingency tables and their relationship with the studied indexes was seen (DMFT+dft; CPITN) and then the statistical package EPIDAT version 3.1 was used to establish the risk levels that each of the factors exert on the indexes. To determine the risk, the ODDS RATIO meta-analysis and all the risk factors were performed using the statistical program EPIDAT version 3.1. The Chi Square test ($p < 0.05$) was used to determine the differences between both populations using the SPSS 15 statistical program.

Results

Tables 1 and 2. Index of Dental Caries (DMFT+dft) in the group of special children and in the group of non-special children.

Two databases were established regarding to DMFT+dft (index of Dental Caries) for both groups, the special children group (study group) and the non-special children group (control group).

Table 1. Index of Dental Caries (DMFT+dft) in the group of special children (SG)

Factor	A	B	C	D
OHI	41	8	8	3
Labor time	11	3	38	8
Complication in the pregnancy	27	11	11	11
Salivary Ph	24	3	30	3
Carbohydrate intake	34	8	15	3
Type of labor	15	3	34	8

Table 2.Index of Dental Caries (DMFT+dft) in the group of non-special children (CG)

Factor	A	B	C	D
OHI	20	3	26	11
Labor time	8	38	3	11
Complication in the pregnancy	8	3	34	15
Salivary Ph	11	8	33	8
Carbohydrate intake	34	15	8	3
Type of labor	31	3	15	11

A, B, C and D represents the Nº of people with DMFT+dft high or low according the factor OHI and the Risk Factors according the group of special children (SG) and the non-special children (CG).

Table 3. Comparison of frequencies of the community periodontal index of treatment needs (CPITN) in the group of special children and in the group of non-special children

Group	CPITN						Total	
	0		1		2			
	Nº	%	Nº	%	Nº	%	Nº	%
Specials	39	65,0	17	28,3	4	6,7	60	100
Non- specials	40	66,7	0	0,0	20	33,3	60	100

The Table 3 shows that in the group of special children the 65% had a value of 0 and the 28.3% had a value of 1. In the case of non-special children, the 66.7% had a value of 0 compared to the 33, 3% that had a value of 2.

Tables 4 and 5. The community periodontal index of treatment needs (CPITN) in the group of special children and in the group of non-special children.

Two databases were established regarding to CPITN (index of periodontal disease) for both groups, the special children group (study group) and the non-special children group (control group).

Table 4. CPITN in the group of special children (SG)

Factor	A	B	C	D
OHI	16	34	7	3
Labor time	3	8	9	30
Complication in the pregnancy	11	27	11	1
Salivary Ph	15	11	7	27
Carbohydrate intake	19	27	3	11
Type of labor	11	8	11	30

Table 5. CPITN in the group of non-special children (CG)

Factor	A	B	C	D
OHI	8	11	11	30
Labor time	3	3	16	38
Complication in the pregnancy	3	3	16	38
Salivary Ph	8	11	11	30
Carbohydrate intake	11	38	8	3
Type of labor	16	18	3	23

A, B, C and D represents the Nº of people with CPITN high or low according the factor OHI and the Risk Factors according the group of special children (SG) and the non-special children (CG).

Tables 6 and 7. Odds Ratio Values (OR) and Determination of the Risk Factors for Dental Caries and Periodontal Disease in Special Children.

It can be seen that according to the Theory of the Risk that was used to determine the risk factors for dental caries and periodontal disease in special children, all the factors considered in the operationalization of the variables were taken into account. When trying to establish if there were significant differences between both populations of special and non-special children with respect to their risk factors, it was found that only the Labor Time Factor was the only one that was statistically significant at 95% reliability (0.03) For this, the SPSS statistical program version 15 was used and the Chi square test was used.

Table 6: Odds Ratio Values (OR) for the risk factors about Dental Caries and Periodontal disease in special children

Factor	Caries (OR)	Periodontal Dis.(OR)
OHI	2,75	0,22
Labor time	0,60	0,80
Complication in the pregnancy	2,33	0,42
Salivary Ph	0,75	4,66
Carbohydrate intake	1,12	2,14
Type of labor	0,88	4,00

Table 7. Determination of the risk factors for Dental Caries and Periodontal disease in special children

Factor	Caries (OR)	Periodontal Dis.(OR)
OHI	Risk	-
Labor time	-	-
Complication in the pregnancy	Risk	-
Salivary Ph	-	Risk
Carbohydrate intake	-	Risk
Type of labor	-	Risk

Table 8. Inferential analysis between risk factors with Dental Caries and Periodontal disease in special children

Risk factor	X^2	p
Labor time	4,62	0,03
DMFT index	67,47	0,36
CPITN index	0,0194	0,89

Discussion

The special patients are considered, according to the American Academy of Psychiatry in its Diagnostic and Statistical Manual, as a profound neuropsychiatric developmental disorder that involves an organic disorder characterized by abnormalities in the brain, especially in the limbic and cerebellar system. Being the purpose of the present research to establish what were the risk factors for dental caries and periodontal disease presented by special and non-special patients (10). The Special Basic Education Center of Huánuco to is an education center for people with mental and neurological disabilities that covers a fairly large number of the special population of Huánuco in total 140 students of which only 60 fulfilled the condition of having siblings. This condition is currently rare because the parents of these children now know that there is a high genetic probability that the siblings of these children have similar problems in the area of communication or learning, as suggested by the Folstein and Rutter who determined in studies done both in brothers and fraternal and identical twins of special children, that the condition has a strong predisposition for genetic transmission to siblings who may suffer cognitive and social deficits (11). On the other hand, although the caries is not hereditary, there is resistance against dental caries that is the result of the combination of several hereditary factors (12). For this reason, it was decided that this research should be done in special children and their healthy siblings (that is, those who did not have background disorders) in order to establish a more controlled pattern of behavior of risk factors for caries and periodontal disease and to have the least intervention of factors foreign to the objectives of the present research.

Within the data observed in the present research, it was found that in the management of the behavior of special children in the dental examination, this data showed that the 56.7% of the special children were collaborators and the 43.3% did not. These findings are interesting considering to Morinushi affirms that many dental professionals have noted the difficulty in managing the behavior of special children during dental treatment, and also describe the use of medication for the behavior management of these children. However, the special children in the present research could be managed without any pharmacology treatment with acceptable results (13).

Another interesting fact of the research was the educational level of the mothers of the special children, finding that the highest percentage was obtained by the higher education category (45.0%), which agrees with the data found in other researches such as those of Bowley and Gardner to affirm that the parents of these patients tend to have high levels of education and social level, however recent studies affirm that at all social and cultural levels it occurs in the same proportion (14).

Regarding the presence of complications during the pregnancy, it was found in general terms that the 40% of special children did not present complications and the 60% did have complications compared to non-special siblings in whom the 86.7% they did not presented complications during the pregnancy. Likewise, in the OHI factor, it was found that it was at risk for the presence of dental caries in special children (OR: 2.75) and in non-special ones (OR: 2.14), being slightly higher in special children. This finding coincides with that reported in the literature because numerous studies affirm that poor oral hygiene is a significant risk factor in the presence of dental caries, on the other hand the time of the bacterial plaque has a significant effect on the

production of acids. The mature bacterial plaques have a greater ability to lower Ph from sugar solutions than newly formed plaques (15). On the other hand, this factor did not show a significant influence with respect to the presence of periodontal disease in special children and non-special children (16).

Regarding the type of labor, the special children had a higher percentage of normal labor (66.7%) compared to non-special children (33.3%), and no statistically significant differences were found, and it was determined that this was a risk factor for periodontal disease in both populations (special children OR: 4.00; non-special children OR: 4.80), it was also found that it was also a risk factor for caries in non-special children (OR: 6.00). With regard to this factor, it is known that in early childhood, during vaginal labor, the baby before birth collects the lactobacillus from the maternal vagina and lodges in the baby's mouth and remains for 6 days, until they are naturally eliminated (17).

Based on what was found in the present research, it is verified that there are statistically significant differences (P <0.05) in only one of the risk factors that constituted the labor time, which indicates that although the other risk factors found for dental caries in special children such as: oral hygiene index (OHI), and complication during the pregnancy; in addition to risk factors for periodontal disease such as: salivary pH, carbohydrate intake; are proven risk factors, there are no statistically significant differences between the two populations studied. Therefore, the preventive programs focused on this type of population group will not varies much in terms of content but in terms of the focus of the recipient, since not only will the special patient be trained, but also the entire family environment, concluding that although they do not there are mainly statistically significant differences between the prevalence of caries and periodontal disease factors, nor between the prevalence of caries and periodontal disease, between the special children of the Special Basic Education Center of Huánuco and their non-special siblings, it does not mean that they do not exist these diseases in them, including the fact that special children and their siblings have been studied is due to the strong genetic pattern they present (18).

At least this is what has been found in the present research that would make us think that the risk factors for both oral diseases are actually different in each population and those found in this study correspond to special children from the Huanuco population and his healthy non-special brothers (19). So, although both populations may have similar risk factors, there is the possibility that, with adequate education regarding preventive oral health measures and the care necessary to maintain a state of oral health in these special children, can be achieved promising results regarding the prevention of oral diseases in this population, which would make the living conditions of these patients with disabilities much more bearable.

Conclusions

The risk factors that determine the presence of caries and periodontal disease in the population of special children are associated with the OHI, the labor time, complication during the pregnancy, salivary pH, carbohydrate intake and type of labor. Being the labor time the only one that showed statistically significant differences.

Gratitude

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