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THE CARIES EXPERIENCE AND DENTISTRY FOLLOWING EVALUATION OF CHILDREN SUBMITTED TO ANTINEOPLASTIC THERAPY

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ABSTRACT

Aim: To evaluate the caries experience and the dentistry following of children submitted to antineoplastic therapy of a reference Hospital to this type of treatment in Para state, Brazil.

Material and Methods: The sample consisted of 46 children. It was included children in the ages of 2 to 12 years diagnosed with cancer that would be submitted to chemotherapy treatment. The evaluation was performed before the chemotherapy treatment and consisted of anamnesis and oral clinical examination. In order to decrease the interexaminer diagnosis variability and increase the data surveys confidentiality, a previous training and calibration was performed before the beginning of the examination.

Results: There was a higher prevalence of childish cancer among male gender children. The age group more affected was between 8 to 12 years. There was a bigger percentage of patients that didn't go to the dentist before the chemotherapy treatment. The children caries experience was evaluated by the CPO-D and medium Ceo-d indexes, obtaining respectively the values of 4,75 and 0,47.

Conclusions: The initial caries experience was high comparing to the international and Brazil average. Most of researched children didn't have a previous dentistry care before the beginning of antineoplastic therapy.

KEYWORDS: cancer, child, dental caries, CPOD index

INTRODUCTION

Cancer or malignant neoplasm corresponds to a group of several diseases which has in common the uncontrolled proliferation of abnormal cells, what may occur in any part of the organism[1]. The causes that propitiate the appearance or evolution of cancer are interconnected, whether they are internal or external. The external causes are related to the environment and the habits of life of each individual. Otherwise the internal causes usually occur due to genetic predisposition and are connected to the organism ability to defend itself from the aggressions or external causes[2].

Currently, in Brazil nine thousand new cases of childhood cancers are estimated per year, representing the second cause of mortality among children and teenagers in the ages of one

to nineteen years[3]. Approximately about 70% of children affected with cancer might be healed if they are diagnosed precociously and treated in specialized centers[3].

The treatment consists of surgery, radiotherapy and/or chemotherapy. The recommended therapies may cause side effects, mainly because the patient's immunosuppression state[4]. Several oral cavity alterations may be observed, such as: mucositis, xerostomia, loss of taste, dental infections and caries[2]. The severity of oral lesions depends of factors that include age, malignity type, oral cavity condition before the treatment and the level of oral care during the antineoplastic therapy[5].

In the cases of pediatric oncologic patients, the ideal is that they be examined by a oral health professional as soon as their diseases are diagnosed, in order to the dentistry treatment to be conducted before the beginning of the oncologic treatment[6]. When there is integration between the dental surgeon and oncologist doctor, the risks of systemic complications are minimized [3].

According to what has been exposed, the aim of this research is to evaluate the caries experience and the dentistry following of children submitted to antineoplastic therapy in a reference hospital to this type of treatment in the Pará state,Brazil.

MATERIAL AND METHODS

The present research evaluated the caries experience and the dentistry following of children submitted to antineoplastic therapy by accurate clinical examination of the structural components of the oral cavity and clinical file fill containing child's personal data personal (name, age, gender, address and phone number) and the dentistry evaluation (search for dentistry treatment and odontogram).

The same one was properly approved by the National Committee of Ethic and Research (NCER), of the Cruzeiro do Sul University, getting a favorable judgment according to the protocol number CE/UCS-005/2014. The parents or responsible were properly informed about the research and expressed their agreement by signing the free and clarified consent term (FCCT).

The present research was conducted in the Ophir Loyola Hospital's area in the city of Belém. Forthis clinical descriptive study the total sample consisted of 46 patients, from both genders, distributed on an age group aged 2 to 12 years. It was included on this research patients diagnosed with cancer that would be submitted to antineoplastic therapy. It was excluded fromthis study children in the final stage of the disease and children with other systemic diseases or syndromes.

The clinical condition of the oral cavity was evaluated, through visual inspection, with the purpose to observe the caries experience of the child before the antineoplastic treatment. For the execution of this stage was used flat dental mirror number 5 and wooden spatula, as was preferred as protocol the previous prophylaxis, made 1 hour before the examination by the children's responsible.

As this research was developed in the hospital itself, many times in the patient's own bed, it was used artificial light of a lantern wrapped in a plastic bag in regard of biosafety purposes.

In order to decrease the interexaminer diagnosis variability and increase the data surveys confidentiality, a previous training and calibration was performed before the beginning of the examination. The calibration process was planned to two examiners. The interexaminer diagnosis agreement was of 0,78 being considered a good agreement[7].

The examiner initiated the clinical examination through the dental elements from 55 to 65 and from 75 to 85 in the deciduous teeth and from 17 to 27 and from 37 to 47 in the mixed teeth.

The caries experience was evaluated through the CPO-D and ceo-d index, which is recommended by the World Health Organization. These indexes were proposed by Klein and Palmer[8], to evaluate the permanent (CPO-D) and deciduous (ceo-d) dentition; it is calculated based on the diagnostic examination of the dental crown and the codes used to identify the diagnostic criterions are differentiated through the numbers to permanent teeth, CPO-D and letters to deciduous teeth, ceo-d.

It was followed the diagnostic criterions used on the SB Brasil 2000 program, realized by the Health Department, standard by WHO, with adaptations, as observed in the codes schematic board (Figure 1).

On this stage the evaluators followed all biosafety rules, such as: washing hands before and after clinical examination, use of Personal Protection Equipment – PPE (glove, mask, hat and coat), equipment sterilization and properdisposal of material waste.

To the data analysis descriptive statistics technique and inferential statistics technique were used. The descriptive statistics technique involved the obtaining of absolute and percentage distributions and the obtaining of average distribution, standard deviation and coefficient of variation. In the inferential analysis, statistical significance was considered to values of

p < 0,05 and was considered doubtful group the value comprehended in the group $0.05 \leq p < 0,10$.

Figure 1. Codes to condition.

CODE			
Primary teeth	**Permanent Teeth**		**Condition/Status**
Crown	**Crown**	**Rooth**	
A	0	0	Sound
B	1	1	Caries
C	2	2	Filled with caries
D	3	3	Filled (no caries)
E	4	-	Missing due to caries
-	5	-	Missing for any other reason
F	6	-	Fissure sealant
G	7	7	Fixed dental prosthesis (crown)
-	8	8	Unerupted
T	T	-	Trauma (injury)
-	9	9	Tooth excluded

RESULTS

The gender that was more affected by child cancer was the male gender with 34 children against 12 of female gender. There are a proportion of male gender children highly superior to 50%.

In the distribution of patients according to the age group, it was observed that the main prevalence was children in the age group of 8-12 years with 46%, followed by the age group 2-4 years with 35% and subsequently the age group of 5-7 years with 19%. The average obtained was 6,6 with standard deviation of 3,0. When the Boxplot of ages was applied, the median obtained was equal to seven years and interquartile range 4 to nine years (Figure 2).

Almost the totalities of cases were admitted to hospital treatment (Figure 3).

In the items related to oral health evaluation, before the antineoplastic treatment, was verified that 67% of the interviewed ones didn't have previous dentistry treatment, 33% didn't go to the dentist before the illness and none of the patients related to be on dentistry treatment (Figure 4).

The caries experience of children in the sample was evaluated by CPO-D and ceo-d indexes, according to their age's appliance. Because of these indexes originated from the count data, the distributions tend to be asymmetric with right tail. For this reason, although it is usually common reported the average of these indexes; it has to be cautious on using only these central tendency measure to describe a sample of these indexes measure.

Figure 2. Boxplot of children's age in the sample.

Child's Age (Years)
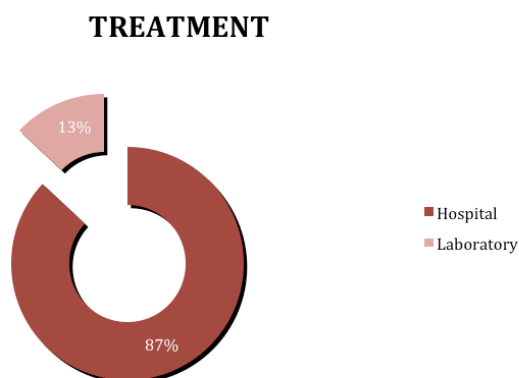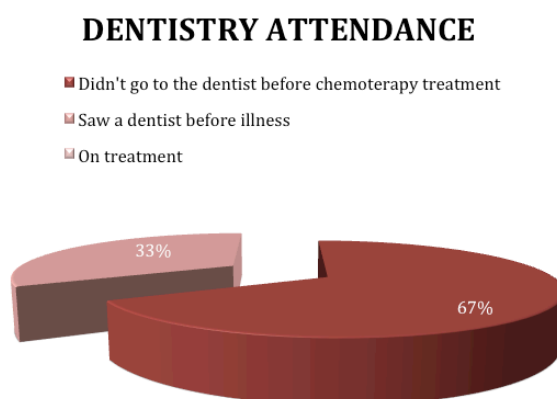
Figure 3. Treatment type of children in the sample.

TREATMENT

Figure 4. Dentist search by children in the sample.

DENTISTRY ATTENDANCE

On this research, 25% of children didn't present caries prevalence by CPO-D, being for this index median, and the caries experience model was equal to two. The maximum value found was 14 and the interquartile gap goes from 0,75 to 8, indicating how disperse is this index distribution.

In a comparison way, to the caries experience evaluated by ceo-d, 74% of children didn't present any caries, being the others distributed between a 1 to 4 index. Through It, this *boxplot* distribution becomes so degenerated that we are not able to distinguish between the minimum, median and the first quartile values, being all equal to zero.

For the caries experience evaluation of children that would be submitted to chemotherapy, it was chosen the CPO-D and ceo-d medium realization. The picture 28 shows the *Boxplot*, which verifies that the CPO-D average was 4,75 and ceo-d was 0,47.

DISCUSSION

The gender that was more affected with childish cancer was male gender with 74% of the cases; the female gender corresponded to only 26%. These data were very similar to the studies performed by Trindade et al.[9] and Barbosa et al.[10], where the same obtained 72,1% to 75% percentage to male gender, respectively. The data also

agrees with a research performed in Belém/PA, where Figueiredo and Nogueira[1] found a percentage of 59,37% to male gender and 40,63% to female gender. The incidence studies performed in Brazil confirms that the higher prevalence of childish cancer affects the male gender in most of the tumors[11].

In the patients' distribution according to age group, it was observed that the highest prevalence of children was in the age group of 8 to 12 years (46%). Corroborating with this research, Trindade et al.[9] obtained higher percentages (37,6%) of children in the age group of 8 to 12 years, however, the age average of the same was superior to this research, thus

obtained a value of 10,69. Barbosa et al.[10] obtained a sample of 32,5% children between 0 to 5 years, 32,5% between 6 to 10 years and 35% over 10 years, that is, the highest cancer affection also prevailed on the highest age group.

Cariello et al.[12], observed that 44,9% of the patients were aged under 6 years old, 19,5% between 11 and 15 years and 9,8% between 16 and 18 years, these data confronts with the data observed in this study. The percentage difference found on this age group can be justified by the lack of methodology compatibility used, that is, all these studies inform the ages referents to cancer in a general way, they didn't subdivide according to the cancer type found, differing of this study that examined only children with LLA.

The main precedence of these families was country of the state (62%), against 38% of families that live in the capital. Cariello et al.[12] observed in their researches that 52,7% of patients came from São Paulo city, 26,2% from São Paulo state country and 21,1% from others states. We must consider that Pará state country is in need of reference units of oncologic attendance, different from the São Paulo state, that is more developed and presents better structures in its country, therefore explaining, differences among the researches results.

On the items related to oral health evaluation, before the chemotherapy treatment, it was verified that 67% of the interviewed didn't have any previous dentistry attendance, 33% went to the dentist before the oncologic treatment and no patient related to be on dentistry treatment, despite there are surgeons dentists in the researched institution. Such fact suggests the need of more

population clarification, whether is during the HOL admission or through informational folders distributed on the oncologic session. These findings are similar to a research performed by Lobão et al.[13], which detected that 64,5% of children with cancer didn't receive previous dentistry attendance to the chemotherapy treatment.

To Almeida et al.[14] an unfavorable oral condition is related to the lack of prevention programs and restoration in oral health, absence of water supply fluoridation, low socioeconomic and cultural level and lack of access to health services. Lopes et al[3], realizes a research with 24 oncologic children and in this sample there was a low percentage (25%) of patients that reported to have searched the dentist before the chemotherapy, against 75% that didn't have any previous dentistry attendance.

For the lack of a dentistry treatment protocol in the institution, it was able to detect that there were children under unsatisfying oral conditions (infection focus) and that were about to initiate antineoplastic treatment; it was up to this researcher to pass along these information to the responsible health team (doctors and nurses) to the correct following to dentistry section. Some of these patients had already a very impaired general health, needing to initiate urgent antineoplastic treatment and other cases, for unknown reasons, were not sent to HOL dentistry section.

In the more specific caries experience analysis, through the CPO-D/ceo-d indexes, it was obtained the 4,75 average to CPO-D and 0,47 to ceo-d in the researched age group, 2 to 12 years. The international parameter, elaborated by OMS, is from 1,2 to 2,6 for both indexes. In Brazil the average

is 2.1, therefore the average index obtained on this research was high on the CPO-D index according to the national average and the international parameter and low to deciduous teeth.

Figueiredo and Nogueira[1] evaluated the CPO-D and ceo-d of HOL oncologic children, thus obtained 2,16 and 2,81 average, respectively. These values were inferior to what refers to CPO-D index and superiors to ceo-d when compared to this research. The justification to this difference may be in the fact that the present research only evaluated children with LLA.

Meneghim et al.[15] demonstrated on his research, that low family income, lowest parents' educational level and inappropriate housing set, low social classes members are related to highest dental caries incidence, what correlates to the data found on this research. For theses authors the oral health is directly related to food, living, work, income, environment, transportation, recreation, freedom, access to health services and information conditions.

CONCLUSIONS

Through the observation of the analyzed aspects, it was concluded that (1) the initial caries experience was high comparing to the international and Brazil average, and (2) most of children researched didn't have previous dentistry attendance to the beginning of antineoplastic treatment.

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