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Original Article

Dentistry Section

Prevalence of Paediatric Head and Neck Malignancies in the North Region of Brazil: A Cross-sectional Study

EMILLY SILVA E SILVA[1], MARINA FADUL NEVES COUTO[2], GERLANE LIMA OLIVEIRA[3], CÁSSIA ALVES DE LIMA LUNA[4], MARCO TULLIO BRAZÃO SILVA[5], CAIO DE ANDRADE HAGE[6], JOHN MINH LE[7], DOUGLAS MAGNO GUIMARÃES[8]

ABSTRACT

Introduction: Head and Neck Cancer (HNC) ranks sixth among the most common men's tumours. The prevalence of HNC in children has increased in several countries, and the prevalence varies worldwide. In several regions in Brazil and the world, a lack of epidemiological data records on childhood HNC is observed, demonstrating little knowledge about the demographic profile of these patients.

Aim: To determine the prevalence of HNC in paediatric patients over the years at a reference centre in the North region of Brazil.

Materials and Methods: A cross-sectional study was conducted with the objective of quantitatively and qualitatively analysing the prevalence of HNC in a reference oncology hospital. The electronic medical records of patients aged 0 to 19 years were reviewed at a referral centre in Northern Brazil from October 2015 to February 2022. Demographic variables, topographic location of tumours, city of origin, patient outcome, and histopathological diagnosis were collected.

Results: A total of 4,113 medical records were analysed, and 126 met the criteria for analysis. Males had a higher incidence n=75 (59.52%) of HNC than females n=51 (40.47%). The age group with the highest percentage of HNC was > 4 to 9-year-old n=40 (31.74%). The most common diagnosis were lymphoma 78 (61.90%), sarcoma 22 (17.46%); carcinoma 14 (11.11%), and histiocytosis 10 (7.93%).

Conclusion: In Northern Brazil, the most common tumour was Hodgkin's lymphoma, and the most prevalent group affected were males aged > 4-9-year-old.

Keywords: Child, Epidemiology, Head and neck neoplasm, Tumours

INTRODUCTION

The HNC ranks sixth among the most common cancers, with an average of 13,470 new cases of oral cancer per 100,000 inhabitants in Brazil, greatly contributing to the mortality of the adult population [1]. HNC is a collective term defined by anatomical-topographic bases to describe malignant tumours of the upper aerodigestive tract. This anatomical region includes the oral cavity, pharynx, and larynx. Considering that these sites are areas directly involved with the function of speech, swallowing, respiration, taste, smell, and others, highly complex treatment is necessary for patients with malignant head and neck neoplasms [2].

In this scenario, childhood HNC stands out. During puberty, the facial skeleton is more susceptible to high doses of radiation, as skeletal development takes on its most critical level. Several changes have been observed in the oral cavity following exposure to radiotherapy and chemotherapy at an early age [3].

The main difference between adult and paediatric cancer is the fact that childhood cancer is not generally associated with individual exposure to environmental risk factors such as smoking, solar radiation, alcohol, obesity, and an unruly diet. The result of this acquired predisposition of cancer in children may result in cancer embryonic cells leading to poorly differentiated tumours; therefore, environmental carcinogens could hypothetically increase the rates at which these mutations occur, but they probably contribute little to the incidences [4].

The State of Pará, the northern region of the country, does not have studies related to the prevalence of childhood HNC, demonstrating a lack of knowledge about interventional health programs to prevent early diagnosis. Limited data on this epidemiological profile in northern Brazil are available, with only studies found on general paediatric cancer, showing a higher prevalence in male patients, with leukemia being the most predominant neoplasm [5]. Considering that an early diagnosis is the best way to tackle the disease and improve survival [6], it becomes essential for decision-making regarding treatment and its procedures, as well as conditions associated with a potential outcome of the disease.

Therefore, the present study aimed to analyse the prevalence of this disease in paediatric patients over the years at a reference centre in the North region of Brazil from 2015 to 2022.

MATERIALS AND METHODS

It was a cross-sectional study with the objective of quantitatively and qualitatively analysing the prevalence of HNC in a reference oncology hospital in the North region of Brazil, between the period October 2015 to February 2022. Analysis of the data collected was held from April to May 2022. The present study was approved by the Ethics Committee of the University Centre of Pará (protocol number 51384821.2.0000.5169).

Inclusion and Exclusion criteria: The possible risks involved in the research, which concern the violation of the identity of voluntary participants, were minimised by guaranteeing anonymity. All patients aged 0-19 years with diagnosis of head and neck tumours registered were included in the study. Medical records of patients with benign tumours, malignant tumours diagnosed outside the head and neck region, second primary tumours, metastases to the head and neck region, tumours affecting the Central Nervous System (CNS), and patients with incomplete medical records were excluded.

Sample size: A total of 4,113 medical records of paediatric patients diagnosed with malignant tumours were captured. Data collection was completed using the Salux (Brazilian Health Management System) software. Information regarding demographic variables (age and sex), topographic location of tumours, city of origin, patient outcome, and histopathological diagnosis were also collected. As it is a secondary data collection, the need for the Informed Consent Term was waived.

Study Procedure

Tumours were grouped and classified according to the 4th edition of the World Health Organisation (WHO) Classification of Head and Neck Tumours, and the following categories were considered: nasal cavity, paranasal sinuses, and skull base; nasopharynx; parapharyngeal space; oral cavity and face; oropharynx (base of tongue, tonsils, adenoids); neck and lymph nodes; salivary glands; odontogenic and maxillofacial bone; and ear [7].

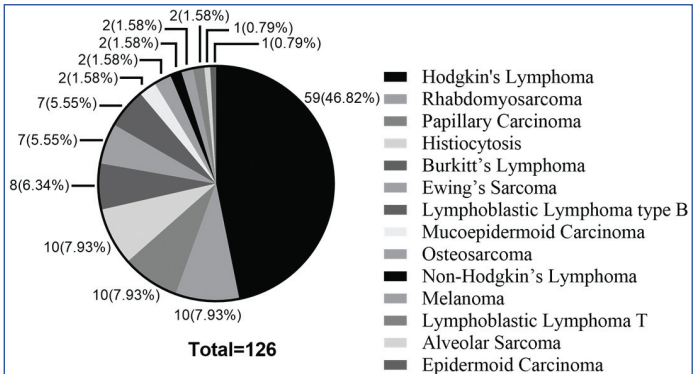
STATISTICAL ANALYSIS

Data were collected in a spreadsheet, systematically organised in Microsoft Office Excel 2013 software (Microsoft Corporation, Redmond, Washington, USA), and then analysed for descriptive statistics using absolute numbers, percentages, mean values, and standard deviations. Patients were also categorised into five groups: <1 year (infancy), 1 to 4 years (toddlerhood), 5 to 9 years (childhood), 10 to 14 years (early adolescence), and 15 to 19 years (late adolescence).

RESULTS

During a period of eight years (from 2015 to 2022), 4,113 medical records of paediatric patients diagnosed with malignant tumours were captured, of which 126 (3.06%) were in the region of the head and neck. The analysis by gender of neoplasms located in the head and neck showed that males prevailed, with 75 (59.52%), compared to females, with 51 (40.47%). The age group with the highest cases of HNC was >4-9-year-old n=40 (31.74%), followed by >9-14-year-old n=39 (30.95%), >14-19-year-old n=35 (27.77%), and one-four-year-old n=12 (9.52%). No cases of children under one year were recorded.

The tumour frequency is represented in [Table/Fig-1]. The most common types of HNC were lymphoma 78 (61.90%), sarcoma 22 (17.46%); carcinoma 14 (11.11%), and histiocytosis 10 (7.93%). The least frequent was melanoma 2 (1.58%). The histological diagnosis with the highest percentages were Hodgkin's lymphoma with 59 (46.82%); rhabdomyosarcoma 11 (8.73%), papillary carcinoma, and histiocytosis with 10 (7.93%).



[Table/Fig-1]: Distribution of lesion diagnoses.

Regarding the 5-year survival of paediatric patients, it was decided to analyse only the largest tumours for a more assertive result. Papillary carcinoma and histiocytosis presented 100% survival, followed by Burkitt's lymphoma (87.5%) and Hodgkin's lymphoma (86.44%). The diagnosis with the lowest survival rate was rhabdomyosarcoma 7 (63.63%). Males had the highest survival rates, especially in Rhabdomyosarcoma, with 71.42%, and Hodgkin's lymphoma (62.74%) [Table/Fig-2].

The most frequent location was the neck and lymph nodes region 84 (66.66%), with 42.06% of the tumours appearing in the cervical region, 21 (16.66%) in the neck and only 10 (7.93%) in the thyroid. The gnathic bone came in second place with 20 (15.87%) cases, where a greater predominance was observed in the mandible 11 (8.73%), followed by the maxilla 6 (4.76%). Tumours located in the oral cavity and face represented the third most affected topographic site 8 (6.34%), with a predominance of the face 4 (3.17%). Nasal cavity, paranasal sinuses, and skull base 5 (3.96%), nasopharynx 3 (2.38%), oropharynx 3 (2.38%), and salivary glands 3 (2.38%) constituted the least frequent topographies [Table/Fig-3].

Diagnoses	N	Rate survival n (%)	Male n (%)	Female n (%)
Hodgkin's lymphoma	59	51 (86.44)	32 (62.74)	19 (37.25)
Rhabdomyosarcoma	11	7 (63.63)	5 (71.42)	2 (28.57)
Papillary carcinoma	10	10 (100)	3 (30)	7 (70)
Histiocytosis	10	10 (100)	6 (60)	4 (40)
Burkitt's lymphoma	8	7 (87.5)	3 (42.85)	4 (57.14)

[Table/Fig-2]: Distribution of lesion diagnoses and rate survival in 5 years.

Anatomic site	Total		Male		Female	
	n	(%)	n	(%)	n	(%)
Nasopharynx	3	(2.38)	2	(1.68)	1	(0.79)
Oropharynx	3	(2.38)	1	(0.79)	2	(1.58)
Odontogenic and maxillofacial bone	20	(15.87)	10	(7.93)	10	(7.93)
Palate	1	(0.79)	-	0	1	(0.79)
Maxilla	6	(4.76)	4	(3.17)	2	(1.58)
Mandible	11	(8.73)	5	(3.96)	6	(4.76)
Skull	2	(1.58)	1	(0.79)	1	(0.79)
Oral cavity and face	8	(6.34)	6	(4.76)	2	(1.58)
Face	4	(3,17)	2	(1.58)	2	(1.58)
Tongue	2	(1.58)	2	(1.58)	-	0
Jugal mucosa	2	(1.58)	2	(1.58)	-	0
Nasal cavity, paranasal sinuses and skull base	5	(3.96)	3	(2.38)	2	(1.58)
Nostril	1	(0.79)	1	(0.79)	-	0
Nasal cavity	1	(0.79)	-	0	1	(0.79)
Orbit	2	(1.58)	1	(0.79)	1	(0.79)
Frontal	1	(0.79)	1	(0.79)	-	0
Neck and lymph nodes	84	(66.66)	51	(40.47)	33	(26.19)
Cervical	53	(42.06)	31	(24.60)	22	(17.46)
Neck	21	(16.66)	17	(13.49)	4	(3.17)
Thyroid	10	(7.93)	3	(2.38)	7	(5.55)
Salivary glands	3	(2.38)	2	(1.58)	1	(0.79)
	126	(100)	75	(59.52)	51	(40.47)

[Table/Fig-3]: Topographic distribution of paediatric head and neck malignant tumours.

The distribution of diagnosis by topographic location is represented in [Table/Fig-4]. In the neck and lymph nodes region, Hodgkin's lymphoma presented the highest rates 59 (46.82%), followed by papillary carcinoma 10 (7.93%). In odontogenic and maxillofacial bone, Ewing's sarcoma and histiocytosis were more prevalent, both at 4.76%. In the oral cavity and face, rhabdomyosarcoma stood out as the most frequent diagnosis, with 6 (4.76%). Burkitt's lymphoma was the tumour subtype with the greatest topographical distribution, affecting the oropharynx 3 (2.38%) and nasopharynx 1 (0.79%) most frequently, and the neck and lymph nodes 3 (2.38%) and gnathic bone 1 (0.79%) with lower percentages. Then, rhabdomyosarcoma was observed with greater coverage in the oral cavity and face 6 (4.76%) and gnathic bone 4 (3.17%) and less frequently in the paranasal sinuses and skull base 1 (0.79%).

The distribution of malignant neoplasms by age group is shown in [Table/Fig-5]. Hodgkin's lymphoma stood out as the most frequent in the age groups >4-9 years, >9-14 years, and >14-19 years. The group of patients aged 1 to 4 years was more affected by

Location	Diagnoses	No. (%)
Nasopharynx	Epidermoid carcinoma	1 (0.79)
	Burkitt's lymphoma	1 (0.79)
	Large cell Non-Hodgkin's lymphoma B	1 (0.79)
Oropharynx	Burkitt's lymphoma	3 (2.38)
Odontogenic and Maxillofacial bone	Histiocytosis	6 (4.76)
	Ewing's sarcoma	6 (4.76)
	Rhabdomyosarcoma	4 (3.17)
	Osteosarcoma	2 (1.58)
	Burkitt's lymphoma	1 (0.79)
	Melanoma	1 (0.79)
Oral cavity and face	Rhabdomyosarcoma	6 (4.76)
	Melanoma	1 (0.79)
	Alveolar sarcoma	1 (0.79)
Nasal cavity, paranasal sinuses and skull base	Histiocytosis	3 (2.38)
	Osteosarcoma	1 (0.79)
	Rhabdomyosarcoma	1 (0.79)
Neck and lymph nodes	Hodgkin's lymphoma	59 (46.82)
	Papillary carcinoma	10 (7.93)
	Lymphoblastic lymphoma type B	7 (5.55)
	Burkitt's lymphoma	3 (2.38)
	Lymphoblastic lymphoma T	2 (1.58)
	Anaplastic Non-Hodgkin's lymphoma	1 (0.79)
	Ewing's sarcoma	1 (0.79)
	Sinus histiocytosis	1 (0.79)
Salivary glands	Mucoepidermoid carcinoma	3 (2.38)
Total		126 (100)

[Table/Fig-4]: Distribution of diagnoses of lesions by tumour location.

Diagnoses	1-4 years (N=12)	>4-9 years (N=40)	>9-14 years (N=39)	>14-19 years (N=35)
Hodgkin's lymphoma	1 (0.79%)	18 (14.28%)	20 (15.87%)	20 (15.87%)
Papillary carcinoma	-	1 (0.79%)	3 (2.38%)	6 (4.76 %)
Rhabdomyosarcoma	2 (1.58%)	3 (2.38%)	4 (3.17%)	2 (1.58%)
Histiocytosis	3 (2.38%)	2 (1.58%)	5 (3.96%)	-
Burkitt's lymphoma	2 (1.58%)	3 (2.38%)	2 (1.58%)	1 (0.79%)
Ewing's sarcoma	1 (0.79%)	4 (3.17%)	1 (0.79%)	1 (0.79%)
Lymphoblastic Lymphoma type B	2 (1.58%)	3 (2.38%)	1 (0.79%)	1 (0.79%)
Mucoepidermoid carcinoma	-	2 (1.58%)	1 (0.79%)	-
Osteosarcoma	-	-	-	3 (2.38%)
Non-Hodgkin's lymphoma	-	1 (0.79%)	1 (0.79%)	-
Melanoma	1 (0.79%)	1 (0.79%)	-	-
Lymphoblastic lymphoma T	-	2 (1.58%)	-	-
Alveolar sarcoma	-	-	-	1 (0.79%)
Epidermoid carcinoma	-	-	1 (0.79%)	-

[Table/Fig-5]: Distribution of HNC by age group.

lymphomas and histiocytosis, including histiocytosis 3 (2.38%), Burkitt lymphoma 2 (1.58%), and lymphoblastic lymphoma type B 2 (1.58%). Patients aged >4-9 years were more affected by Hodgkin's lymphoma 18 (14.28%), Ewing's sarcoma 4 (3.17%), and Burkitt's lymphoma 3 (2.38%). In the group aged >9-14 years, the most prevalent types of tumours were Hodgkin's lymphoma 20 (15.87%), histiocytosis 5 (3.96%), and rhabdomyosarcoma with 4 (3.17%).

DISCUSSION

Head and Neck Cancer (HNC) has environmental and genetic causes and can be induced by factors related to the geographic region. Childhood cancer incidence and mortality rates represent a global public health problem; however, the worldwide prevalence of HNC in paediatric patients remains unknown. The present study describes demographic and clinicopathological patterns of HNC in paediatric patients from an underdeveloped region of Brazil. In the present study, HNC was responsible for 3.06% of malignant tumours diagnosed in a period of 8 years, prevailing with higher rates in males and the age group of >4-9 years. The most frequent diagnosis were Hodgkin's lymphoma, papillary thyroid carcinoma, and rhabdomyosarcoma.

Schwartz I et al., surveyed data from 1973 to 2010, showing that out of 10,181 diagnosis of childhood HNC in the US, the most common were lymphoma (23.8%) and papillary thyroid carcinoma (23.3%) [8]. The incidence of lymphoma tends to be higher in developed regions of the world because it generally develops in the context of oncogenic viruses and carcinogenic chemicals, which are more prevalent in these regions [9]. In the present study, lymphoma was also indicated as the most frequent diagnosis, representing 61.90% of HNC cases found from 2015 to 2022. However, papillary thyroid carcinoma had a low incidence in our study, with 12 (7.93%). Thus, a developed country such as the United States of America (USA) presented patterns of HNC diagnosis that are similar to the patterns of a poor region of Brazil, and it is possible to observe that lymphomas also have a high percentage in third-world countries.

Regarding oncogenic viruses, there is a well-studied association between the Epstein-Barr Virus (EBV), malaria infection, and the development of lymphomas. Individuals born in endemic areas, such as sub-Saharan Africa, and diagnosed with these diseases have an increased risk of lymphoid neoplasms [10,11]. According to Ajayi OF et al., the incidence of childhood HNC in Nigeria-Africa is more frequent in males, with a male-to-female ratio of 2.9:1 [12]. Burkitt's lymphoma (38.3%) was the most frequent malignant tumour. Lymphomas (53.2%) were the most common malignancy, followed by sarcomas (36.2%) and carcinomas (10.6%). The present research also showed a higher prevalence of paediatric HNC in males, 75 (59.52%), and lymphomas and carcinomas were among the three most frequent diagnosis. Therefore, it is observed that the pattern of head and neck malignancies in children in Nigeria-Africa is similar to that of the Northern Region of Brazil in terms of diagnosis and gender.

In Kolkata, India, during a 3-year study in a sample of 161 paediatric patients with HNC, it was observed that the predominant location was in the neck and lymph nodes, with lymphomas being the most common malignant lesions diagnosed (43.39%), with Non-Hodgkin's lymphoma being predominant (26.41%), followed by rhabdomyosarcoma (20.75%) [13]. These results corroborate the findings in northern Brazil, as lymphoma also predominated as the most common diagnosis, followed by rhabdomyosarcoma. The anatomical site with the highest percentages was also in the neck and lymph nodes region. However, when comparing the patterns, it is noted that, while in India, Non-Hodgkin's lymphoma stood out as the most common; in the North of Brazil, it was not among the most frequent, presenting only 2 (1.58%) of cases of childhood HNC.

Hodgkin's Lymphoma has higher rates in teenagers, with an estimated 4,200 teenagers and young adults aged between 15 and 39 diagnosed with Hodgkin's Lymphoma in 2020, with 800 of these cases being between the ages of 15 and 19 [14]. Englund A et al., commented in their research that of the paediatric patients reported with Hodgkin's Lymphoma in Denmark (1990-2010) and Sweden (1992-2009), children (0-9 years) less frequently presented with advanced disease than adolescents (10-17 years) [15]. In this

Sl no.	Author's name and year	Place of study	Number of subjects	Objective	Conclusions
1	Ajayi OF et al., 2007 [12]	Nigerian	353	To determine the relative frequency of orofacial malignant neoplasm in children and adolescents.	Malignant neoplasm constituted 13.3% of orofacial tumours and tumour-like lesions in children and adolescent in our centre. In agreement with previous reports from Africa, Burkitt's lymphoma is the most common malignant tumour and carcinoma is relative rare in this age group.
2	Sengupta S and Pal R 2009 [13]	Kolkata, India	161	To demonstrate and compare the unique clinicopathological features in the Indian paediatric population and their correlations with the final histopathological diagnosis.	Lymphomas, in the neck region, were the most common malignant manifestations in the studied population.
3	Schwartz I et al., 2015 [8]	United States	10,181	Determine the epidemiology of Head and Neck (H&N) cancer in the US paediatric population, between 1973 and 2010.	The paediatric H&N cancer continues to rise. The proportion of H&N malignancy to all paediatric cancer is stable.
4	Aborleda LPA et al., 2018 [17]	Sao Paulo, Southeast Brazil	7,181	Prevalence of childhood cancer patients diagnosed with HNC in the period between 1986 and 2016.	The current study originally demonstrated that lymphomas may be more frequent than carcinomas and sarcomas in paediatric patients diagnosed with Head and Neck Cancer (HNC) in Brazil.
5	Person L et al., 2021 [16]	France	1,623	To describe the distribution, the incidence and survival rates of children with malignant HNC in France, over the 2000-2015 period.	Childhood HNC are of varied natures, have a low incidence, are often poorly described in terms of natural evolution and optimal treatment.
	Present study	North of Brazil	126	Prevalence of HNC in the paediatric population in northern Brazil, from 2015-2022.	The most common tumour was Hodgkin's lymphoma, cervical lymph nodes were the most common location for recurrence, and overall survival outcome was favourable. The most prevalent group affected were males aged >4-9 years.

[Table/Fig-6]: Study comparison with different regions of the world [8,12,13,16,17].

research, Hodgkin's Lymphoma was present in the age groups 1-4 years, >4-9 years, >9-14 years, and >14-19 years, being more frequent in the more advanced age groups, >9-14 years and >14-19 years with 20 (15.87%), presenting a similar pattern to that presented by Englund A et al., [15].

In a study using the French National Registry of Childhood Cancer database, Person L et al., observed that in the French child population diagnosed with HNC, the main histological types were carcinomas (37%), especially thyroid carcinoma (26.1%), rhabdomyosarcomas (24%), and Burkitt's lymphomas (9%), and the most affected anatomical sites were the thyroid (27%) and pharynx (17%) [16]. There were discrepancies in the results of this study when compared with the results of Person L et al., since carcinomas occupied the third place among the most frequent types of HNC, representing only 11.11%, rhabdomyosarcoma presented only 8.27% of cases, and Burkitt's lymphoma 8.73%. Regarding anatomical locations, the thyroid was the most frequent in France, and this study presented low percentages, 7.93%. The pharynx represented only 4.76%. In contrast to the European scenario, in Northern Brazil, the most affected locations were the neck and lymph nodes, leading with 66.66%, followed by odontogenic and maxillofacial bone (15.87%).

Arboleda LPA et al., surveyed the records of childhood cancer patients diagnosed with HNC at Boldrini Children's Center in São Paulo, Brazil, during the period between 1986 and 2016 [17]. The incidence was more frequent in males, with a male-to-female ratio of 1.91:1, and the age group from 10 to 14 years old had a higher prevalence of malignant tumours, followed by patients aged 5 to 9 years. Burkitt's lymphoma (16.62%), Hodgkin's lymphoma (13.68%), and rhabdomyosarcoma (12.81%) were the most common histopathological diagnosis. The main anatomical sites affected were the cervical region and lymph nodes (41.42%), the nasopharynx (22.89%), and the thyroid gland (6.54%). This research also showed a higher prevalence of cases of childhood HNC in males and the age group >4-9 years and >9-14 years. The most recurrent anatomical site was similar in both studies; in the present research, the neck and lymph nodes region also presented the highest rates (66.66%) with the cervical being a prominent sub-region (42.06%). However, this survey showed that the nasopharynx and thyroid were not among the most affected anatomical regions; the nasopharynx presented only 2.38% and the thyroid 7.93%. While in São Paulo, Burkitt's lymphoma was the most prevalent histological type, in the North Region of Brazil, Hodgkin's lymphoma was the one with the highest percentage, and Burkitt's lymphoma was fifth with 6.34%, and rhabdomyosarcoma presented 8.73%. Therefore, concerning gender, age group, and the most prevalent anatomical site, both regions of Brazil showed similarities; however, the panorama of the most common histological types was divergent. Similar studies on the prevalence of paediatric HNC in different regions of the world in comparison with the present study results are shown in [Table/Fig-6] [8,12,13,16,17].

Mortality involving childhood neoplasms has shown a downward trend as a likely result of the increased survival probabilities accumulated in recent decades [18]. Considering the overall one-year and 5-year survival rates among children with HNC, Person L et al., observed in their research that 94.2% of lymphomas had survival rates >5 years, and the subgroups of diagnosis that also had higher percentages with survival >5 years were papillary thyroid carcinoma, Hodgkin's lymphoma, and Burkitt's lymphoma [16]. Accordingly, this research showed similar results, in which the subgroups of diagnosis with the best survival percentages were papillary thyroid carcinoma (100%), Hodgkin's lymphoma (88.44%), and Burkitt's lymphoma (87.5%). Therefore, it was possible to observe that, in general, HNC survival in the paediatric population in Northern Brazil was stable.

Limitation(s)

There was a short period (2015-2022) for data collection, which resulted in a low number of available medical records, limiting the present study results. An alternative would be to update the research by adding more than 10 years of data.

CONCLUSION(S)

The present study showed that the prevalence of paediatric HNC was 3.06%. The most affected areas were the cervical lymph nodes followed by the oral and maxillofacial regions. The frequent age group was >4-9 years, and the common diagnosis were Hodgkin's lymphoma, papillary thyroid carcinoma, and rhabdomyosarcoma. The diagnosis with the highest survival rates were papillary carcinoma, histiocytosis, and Hodgkin's lymphoma. The present study features were comparable to studies from the United States and Africa in terms of diagnostic patterns; however, the Southeast of Brazil differed from the North in terms of the most frequent histological types. The data evaluated in the research highlighted the importance of establishing public policies

for children diagnosed with HNC and supporting educational campaigns for the prevention and early diagnosis of the paediatric age group, which should be addressed in each region due to the regional disparity observed.

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PARTICULARS OF CONTRIBUTORS:

1. Undergraduate Student, Department of Dentistry, University Center of Pará (CESUPA), Belem, Pará, Brazil.
2. Undergraduate Student, Department of Dentistry, University Center of Pará (CESUPA), Belem, Pará, Brazil.
3. Undergraduate Student, Department of Dentistry, University Center of Pará (CESUPA), Belem, Pará, Brazil.
4. Undergraduate Student, Department of Dentistry, University Center of Pará (CESUPA), Belem, Pará, Brazil.
5. Professor, Department of Oral Pathology, Montes Claros State University, Minas Gerais, Montes Claros, Brazil.
6. MSc Scholar, Department of Dentistry, University Center of Pará (CESUPA), Belem, Pará, Brazil.
7. Professor, Department of Oral and Maxillofacial Surgery, University of Alabama at Birmingham, Birmingham, Alabama, USA.
8. Professor, Department of Oral Pathology, University Center of Pará (CESUPA), Belem, Pará, Brazil.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:
Emilly Silva E Silva,
Nove de Janeiro Street, 927, 66060-575, Belem, Pará, Brazil.
E-mail: emilly_ss04@hotmail.com

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