

Epidemiological and anatomopathological features of pediatric head and neck tumors in Benin

Abstract

Objective: This research work aims to investigate the epidemiological and anatomopathological characteristics of ENT and head and neck tumors among children in Benin.

Materials and methods: It was a cross-sectional and descriptive study carried out from January 1, 2009 to December 31, 2014. It was focused on all the reports of anatomopathological examinations of ENT, head and neck tissue mass among subjects aged no more than 15 years identified in Benin and whose histological diagnosis was a tumor.

Findings: Among a total of 611 ear, nose- & throat (ENT), head and neck tumors colligated, 100 were about children (16.4%). These were 23 cases of malignant tumors and 77 cases of benign tumors. Sex ratio was 1.3 for all the tumors; it was 1.1 for benign tumors and 2.3 for malignant tumors.

Cancers were primarily located in the pharynx with 9 cases out of 23, followed by 7 cases in nose and maxillary sinus. Benign tumors were mainly related to nose and maxillary sinus with 30 cases (39% of benign tumors) and larynx with 24 cases (31.2%). Various histological types were investigated. As regards cancers, they were mainly squamous cell carcinoma cancers (8 cases out of 23 cancers); and benign tumors were mainly papilloma (46.8%) followed by fibroma (16.9%) and hemangioma (13%).

Conclusion: The predominance of papillomas suggests the possibility of prevention due to the important role of human papillomavirus (HPV) in their genesis.

Keywords: cancer, tumors, head and neck, papilloma, Child, ENT

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Introduction

Head and neck tumors have been investigated in several research works. Most of those studies were centered on malignant tumors. In general and particularly in Africa, few works are available in literature about childhood head and neck tumors. However, children are not spared from the adverse effects of that disease. This may be due to the fact that children are less affected by those tumors than adults.^{1,2} Indeed, childhood cancers are rare.³ Nevertheless, they are an important public health problem insofar as in industrialized countries, cancers are the main cause of death between the ages of 1 and 15 years after accidental causes.³ In children, no environmental or behavioural factors have been discovered, and it is gene abnormalities that are at the forefront in the genesis of cancers.⁴ As for benign tumors, they are even less documented perhaps because they are considered less serious. Another reason for the limited amount of African work available in the literature there is lack of efficient system for gathering data on tumors in many African countries, including Benin. The purpose of this study was to investigate the epidemiological and anatomopathological characteristics of head and neck tumors among children in Benin.

Material and methods

This research work was conducted in Benin, a country located in West Africa which has no regional or national system for the gathering of data on tumors. It was a cross-sectional and descriptive study of ENT, head and neck tumors histologically confirmed among children during the time period running from January 1, 2009 to December 31, 2014. Those tumors were colligated in the registers of the five (05) public and private laboratories of anatomy and pathological cytology

existing in Benin at the time of the study. They were also colligated in the registers of pathological anatomy results of the only hospital of the country which sends its requests for histological examination abroad (in Italy, by virtue of a partnership agreement). This study has included all the results of anatomopathological examinations of ENT or head and neck (ear, nasal cavity and accessory sinus, maxillary sinuses, oral cavity, salivary glands, larynx, pharynx and thyroid) tissue masses the histological diagnosis of which was a cancer or a benign tumor in a subject aged no more than fifteen years. Our research work did not investigate pseudotumors (cysts, inflammatory granuloma, and colloid goiter due to excess of colloidal substance and not to cell proliferation) and all cases of collected sample which did not help identify the nature of the tumor. The variables investigated were the age and sex of the patient, as well as the location and histological type of tumor. The data were collected from the registers and records of the six (06) health centers covered by this study. The French version of the software EPIDATA 3.1 served for the entry of data. The software EPIINFO 3.5 was used for the analysis and processing of the said data.

Findings

Frequency

During the study period, we identified 611 cases of ENT, head and neck tumors, including 298 malignant tumors. Children were affected by 100 of them (16.4%) including 23 which were malignant and 77 benign. Childhood malignant tumors accounted for 7.7% of all the 298 malignant ENT, head and neck tumors identified during the time period of the study.

Sex and age

ENT, head and neck tumors affected 56 boys and 44 girls i.e. a sex ratio equal to 1.3 for all the childhood ENT, head and neck tumors.

Sex ratio was equal to 1.1 for benign tumors and 2.3 for malignant tumors. The distribution according to age of children with tumor is summarized in Table 1.

Table 1 Distribution of childhood ENT, head and neck tumors according to age in Benin, January 2009- December 2014

	Malignant tumor		Benign tumor		Total	
	N	(%)	N	(%)	n	(%)
[0-5]	5	(21.74)	23	(29.87)	28	(28.00)
[6-10]	8	(34.78)	23	(29.87)	31	(31.00)
[11-15]	10	(43.48)	31	(40.26)	41	(41.00)
Total	23	(100.00)	77	(100.00)	100	(100.00)

Location and histological types of tumor

In general, tumors of nasal and maxillary cavities were identified at an advanced stage which makes it difficult to specify the onset or starting point of tumor. Among the 23 malignant tumors colligated, 15 were carcinoma. Table 2 indicates the distribution of malignant

ENT, head and neck tumors in children according to their histological type and site.

40.26% of the 77 benign tumors were papilloma. Table 3 shows the distribution of benign ENT, head and neck tumors among children according to their histological type and location.

Table 2 Distribution of malignant ENT, head and neck tumors according to histological type and location in Benin, January 2009 - December 2014

Histological type	Oral cavity	Salivary gland	Pharynx	Nasal cavities, maxillary sinus	Thy-roid	Total
Types of carcinoma						
- Epidermoid	-	-	6	3	-	9
- Papillary	-	-	-	-	2	2
-Muco-epidermoid	-	2	-	-	-	2
-Ameloblastic	-	-	-	1	-	1
-Lympho-epithelial	-	-	1	-	-	1
Lymphoma	1	-	2	-	-	3
Neuroblastoma	-	-	-	2	-	2
Liposarcoma	1	-	-	-	-	1
Plasmocytoma	-	-	-	1	-	1
Malignant fibrous histiocytoma	1	-	-	-	-	1
Total	3	2	9	7	2	23

Table 3 Distribution of benign childhood ENT, head and neck tumors according to histologic al type and location in Benin, January 2009-December 2014

Histological type	Oral cavity	Salivary gland	Pharynx	Larynx	Nasal/ maxillary cavities	Ear	Total
Papilloma	4	-	1	10	1	-	16
Inverted papilloma	-	-	-	-	5	-	5
Papillomatosis	-	-	1	14	-	-	15
Fibroma	1	-	-	-	-	-	1
Ossifying fibroma	-	-	-	-	8	-	8
Fibrous dysplasia	-	-	-	-	4	-	4
Hemangioma	6	-	-	-	3	1	10
Pleomorphic adenoma	-	5	-	-	-	-	5
Schwannoma	-	-	-	-	3	-	3
Angiofibroma	-	-	1	-	-	1	2
Neurofibroma	-	-	-	-	1	1	2
Ameloblastoma	-	-	-	-	2	-	2
Osteoma	-	-	-	-	2	-	2
*Others	1	-	-	-	1	-	2
Total	12	5	3	24	30	3	77

*Others: GCT (maxillary, giant-cell tumor/); GCM (oral cavity), granular cell myoblastoma.

Discussion

Relatively few studies are available about childhood head and neck tumors as a whole. In Benin they were focused on 16.4% of all head and neck tumors. This frequency does not give a true picture of the reality as it is so often the case in Africa insofar as many patients do not have access to health care. This reduced accessibility is due to financial, geographical or cultural problems. Nevertheless, there are few head and neck tumors among children; and that scarcity of pediatric head and neck tumors, particularly the malignant ones, has been reported by many authors.^{5,6} However, an increase has been reported in the frequency of childhood head and neck cancers which is more significant than the one observed in cancers of that age in general.⁷ Non-genetic factors including environmental factors have been incriminated as the cause of that increase. In a study conducted in the hospitals of Ghana, a country located in West Africa like Benin, childhood head and neck tumors accounted for 13.5% of all the head and neck tumors, with 613 cases including 30.3% which were malignant; those malignant tumors accounted for 11% of all the head and neck tumors.⁸ In Togo, a country located between Benin and Ghana, 22 cases of pediatric head and neck cancers accounting for 5.5% of all malignant head and neck tumors were reported in 2016.⁹ In Benin, childhood head and neck cancers accounted for 7.7% of all head and neck malignant tumors.

The distribution of cancers according to age seems to indicate that cases of cancer increased with age but the little number of cases of cancer does not enable to draw a valid conclusion. In a study conducted in the United States on the largest cohort of malignant tumors of the head and neck among children to date, Albright et al.⁷ reported that those cancers were more common in adolescents aged 15 to 18 years (39%), followed by children aged 4 years and under (27%), then those from 10 to 14 years old (24%) and those from 5 to 9 years (13%).⁷ However, in that cohort, children aged 4 years and under suffered mainly from retinoblastoma which is not among head and neck cancers. As far as sex is concerned, girls were included in this study as much as boys in the cases of benign tumors, but male predominance was clear in case of malignant tumors. This was also the case in Ghana with a sex ratio equal to 1.86 for malignant tumors whereas it was 0.73 for benign tumors.⁸ That male predominance of malignant tumors in children has been reported in many studies.^{5,10,11} In the United States, Albright et al.,⁷ also found male predominance before 15 years but as soon as adolescents were included, the predominance was reversed due to high ratio of thyroid cancers among adolescents.⁷

In Benin, malignant tumors' locations were mainly pharynx (9 out of 23 cases) followed by nose and maxillary sinus (7 out of 23 cases). Those malignant tumors were carcinoma (a total of 15 cases out of 23) and then lymphoma (3 cases). In Ghana, childhood malignant tumors were mainly lymphoma (54.80% of malignant tumors) located in the neck, followed by nasopharyngeal carcinoma (19.90%).⁸ Albright et al.,⁷ also reported a predominance of lymphoma among malignant tumors of the head and the neck among the children.⁷ Another study conducted in the United States of America on cancers of the head and the neck among children has pointed out predominance in salivary glands followed by nasopharyngeal neoplasms.⁶ In Germany, the histological types of cancer of the head and the neck most commonly observed among the children were soft-tissue sarcomas dominated by rhabdomyosarcomas followed by lymphomas and thyroid carcinomas.¹⁰ We did not observe thyroid tumor in our cohort. Sengupta et al.,⁵ reported the scarcity of thyroid carcinomas in India.⁵ In the United States of America, Albright et al.,⁷ highlighted that

proportion of thyroid carcinoma was higher than pediatric malignant tumors, particularly among female adolescents.⁷

As far as benign tumors are concerned, in this study they were mainly papillomas located in the larynx, followed by hemangiomas. The same occurred in Ghana.⁸ Laryngeal papillomatosis is the most common benign tumor located in the larynx of the child. Its viral etiology (human papillomavirus 6 and 11) is known. Many authors have reported studies conducted to identify clearly its route of transmission to children and to emphasize the value of immunizations. This opens up new prospects for the prevention of benign tumors.¹²⁻¹⁴

Conclusion

Knowledge of epidemiological and anatomopathological features of head and neck tumors may contribute to improve their management. In Benin, pediatric head and neck tumors involved all age ranges. Malignant tumors were mainly carcinomas; this does not correspond to literature data in which lymphomas are primarily found out. As far as benign tumors are concerned, papillary tumors are the most common type. This predominance of papillomas suggests that prevention is possible due to the important role of human papilloma virus in their genesis.

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Conflict of interest

The authors declare that there is no conflict of interest regarding the publication of this paper.

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