Epidemiology of Head and Neck Cancers in Maiduguri-Northeastern Nigeria

**Aliyu M. Kodiya[1*], Adamu I. Adamu[2], Haruna A. Nggada[2],
Hamman I. Garandawa[1], Yusuf B. Ngamdu[1], Mala B. Sandabe[1]
and Abdullahi Isa[1]**

[1]*Department of Ear, Nose and Throat Surgery, College of Medical Sciences, University of Maiduguri,
Nigeria.*
[2]*Department of Histopathology, College of Medical Sciences, University of Maiduguri, Nigeria.*

Authors' contributions

This work was carried out in collaboration between all authors. Author AMK designed the study, wrote the protocol and wrote the first draft of the manuscript. Author AIA managed data collection and wrote part of the manuscript, author YBN managed literature search. All authors read, corrected and approved the final manuscript.

Original Research Article

ABSTRACT

Head and neck cancers is one of the common health problems in our environment affecting relatively the youth. The paucity of literature on community based studies in Nigeria to determine the incidence of the disease obscure its burden, pattern and magnitude. This study presents epidemiological characteristics of head and neck cancers in Maiduguri as seen during the period of insurgency.

A 5 year retrospective review of patients seen from January, 2010 to December, 2014 with histologically diagnosed head and neck cancers. Data extracted from the records of histopathology department of University of Maiduguri Teaching Hospital was analyzed using SPSS version 16.0.

Of the 7655 patients, 1312 (17.14%) were cancers and 217 (16.54%) of this was head and neck malignancies. Average age was 35.5 years with SD±20.07. About 69% of cases were epithelial in origin and 60.83% of patients were less than 41 years of age. The age group worse affected by

_____

Corresponding author: E-mail: dockodiya@yahoo.com;

carcinoma is older than those with sarcoma and lymphoma.

Head and neck is not uncommon in Maiduguri even in the face of insurgency, it is also among one of the common health problems of the relatively young. This therefore call for in-depth research on aetiological factors. Relevant authorities shall also establish oncology centers which will promote education, screening programmes, early detection, prevention and control of head and neck cancers.

Keywords: Head and neck cancers; epidemiology; Maiduguri; Northeastern Nigeria.

1. INTRODUCTION

Cancers are increasingly assuming a critical position as a public health problem in sub-Saharan Africa. While it is difficult to ascertain its prevalence in Nigeria due to limited literature from community based studies, it constitutes 5%-50% of all cancers worldwide [1]. In 2008, the International Agency for Research on Cancer (IARC) reported that 715,000 new cancer cases and 542,000 cancer deaths were recorded in Africa and these may double by the year 2030 [2]. Like many other diseases in African, cancer does not form part of governments' priority list. This may be due to lack of awareness of the real burden of the disease because the prevalence still remained largely undetermined in this environment. Other compounding factors may be the ever increasing public health problems including communicable diseases as well as limited resources both human and material.

In Africa, cancers are often diagnosed late owing to late presentation. Several factors may be responsible for this late presentation ranging from socio-cultural (stigmatization) to lack of awareness of early features and virtually none existence of screening and prevention programs [3]. Good clinical history, thorough physical examination and appropriate investigations are required for accurate diagnosis and treatment of Head and neck cancers. Radiologic imaging like Computerized Tomographic (CT) scan and magnetic resonance imaging as the case maybe are very useful diagnostic tools. Fine needle aspiration for cytology and examination under anaesthesia for tissue biopsy are necessary in obtaining a histologic diagnosis [4,5]. Treatment modalities may include chemotherapy, radio-therapy, and surgery and/or combination therapy. Patient and tumour characteristics such as age, tumour stage and type, concomitant comorbidities affects treatment outcomes in patients with head and neck cancers.

In this part of the world a complex interplay of factors such as poverty, ignorance, late patient presentation, inadequate human and material resources impact negatively on the outcome of treatment of head and neck cancers [6]. These factors may be exaggerated during war or crisis situation. Maiduguri is one of the major towns in the northeastern Nigeria and it is the capital of Borno State, located between the Sahel and Sudan Savannah. It occupies an area of about 69,436 km^2 and lies within latitude 11°5" N and longitude 13°5" E vegetation zone of sub-Saharan Africa. It has a wide temperature range of 30°C − 40°C with the hottest period between March and April. This vast land with wide temperature range has no oncology center. Therefore most patients with histologic diagnosis are referred to radiotherapy centers usually 700 km to 900 km away from our center. Borno state was be fallen by insurgency since July, 2009 and this affects all services including health. Travelling out and into the city of Maiduguri also became difficult. This study presents the epidemiological aspects of head and neck malignant tumors in Maiduguri, northeastern Nigeria seen during insurgency period.

2. METHODS AND MATERIALS

This is a 5 years retrospective review of clinical records of patients seen between January, 2010 and December, 2014. Data was collected from histopathology diagnostic book of the University of Maiduguri teaching hospital (UMTH). The register contained epidemiological information of the patients and parameters such as biodata, site of lesion and histologic diagnoses were extracted. All patients without histologic diagnosis were excluded from the study. Information kept in this register is secured with no alteration and all records were serially documented to avoid duplication. Data collected was analysed with statistical package for social sciences (SPSS) version 16. In the past, UMTH serves as referral center which provides tertiary health care to the six states in the Northeastern Nigeria and to some extend to border towns of neighboring countries like Niger, Chad and Cameroon.

3. RESULTS

We reviewed records of patients with head and neck cancers seen between January, 2010 and December, 2014. Of the 7655 specimens processed during the year under review, 1312 (17.14%) were cancers while 6343 (82.86%) were either benign or non-neoplastic. Two hundred and seventeen (217) out of the 1312 cancers are from the head and neck constituting 16.54%. Age ranged between 3 months and 84 years with a mean of 35.5, SD ±20.07. The epidemiology of head and neck cancer in Maiuguri-Nigéria show the predominance in male (2.2:1) and 60.83% of patients with 40 years or below.

Table 1. Distribution by gender

Gender	Frequency	Percent
Male	150	69.1
Female	67	30.9
Total	217	100.0

Males were affected more than females
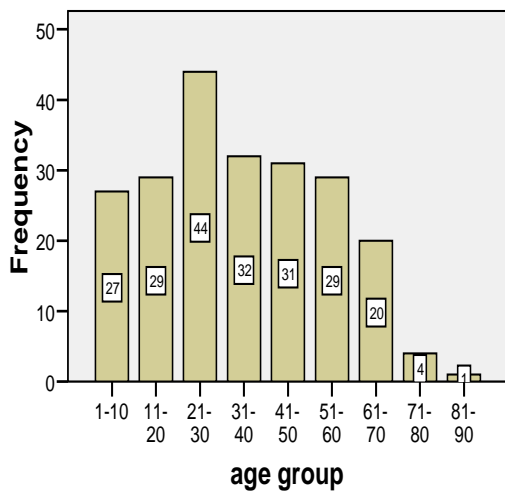
Fig. 1. Distribution by age group
*Overall, the most affected age group is 21- 30 years*

4. DISCUSSION

Changes in life style including smoking, alcohol consumption and longevity followed the rapid economic growth in developing countries. It has been reported that about 66% of oral and pharyngeal cancers apart from nasopharyngeal carcinoma occur in developing countries [7]. In this study a total of 217 cases of the 1312 malignancies constituting 16.54% were of head and neck origin seen over 5 years. This compares with the report from Ife, Southwestern Nigeria of 313 cases over 10 years [8]. Seven hundred and ten (710) cases from Jos, North central Nigeria over 15 years [9] and in Nairobi, Kenya a community based study 697 cases in four years [10]. There is great variation in reports from different parts of the world in terms of geographical distribution, sub-sites involved as well as epidemiologic characteristics of Head and Neck cancers [11,12]. In our series we found that males were more affected than females (m:f 2.2:1). This is in consonance with many studies globally [13,14,15]. The exact reason for male preponderance is not well understood, and in Nigeria there seem to be no gender difference in risk exposure and therefore in addition to environmental factors, possible hormonal influence need to be explored. It has been reported globally that incidence of tumours are generally low before the age of 40 years and that head and neck cancers are more frequent among the old [16,17,18,19]. Majority of cases (60.83%) in our series are below 41 years of age. An incidence of between 17.3% and 40% under 40 years with oral cancers in Africa has been reported [16,18,20-23]. This high incidence among the young has no definite explanation but may not be unconnected to low life expectancy, early exposure to risk factors and higher percentage of young people below 40 years of age in African [17]. The wide variation in reported incidence of head and neck cancer in Africa may partly be attributed to sample size, study design, sites of tumour included in analysis as head and neck in addition to genetics and environmental considerations.

The most common type of malignancy in this study is carcinoma accounting for 149 (68.66%) of cases. This is in agreement with some studies from Africa and other parts of the world [24,25]. This however differs from that of southwestern Nigeria [8] where lymphoma was reported as the predominant type of malignancy in the head and neck. This difference may possibly be explained by their classification of squamous cell carcinoma as the only epithelial malignancy in their study. Sarcomas were found to be the second most common tumor type (16.13%), which agrees with the findings of some studies from three (3) regions of Nigeria- southwest [26], south-south [27] and North central [28]. Lymphomas were the least common cancers in our series constituting 33 (15.21%) of cases, however some centers reported lymphoma to be the second most common [8, 9,29-31]. A case of Mycosis Fungoides a very rare Cutaneous T-Cell lymphoma was diagnosed in a 20years old female patient.

In this study squamous cell carcinoma was the commonest histologic type (35.90%) followed by lymphoma (14.70%), this is in keeping with findings in many studies across regions [17,29,32,33]. Nasopharyngeal carcinoma (NPC) was next histologic diagnosis made constituting 12.00%. Many studies from different geopolitical zones of Nigeria reported NPC as the most frequent [26,28,29-31,34]. Sarcomas of soft tissue origin are rare in the head and neck, it accounts for less than 1% of all head and neck neoplasm [35,36]. In this series rhabdomyosarcoma accounts for 6.90% of histologic type of all head and neck cancers ranking fourth. It's been cited that the most common soft tissue sarcoma of this region is rhabdomyosarcoma [37] which concur with our findings.
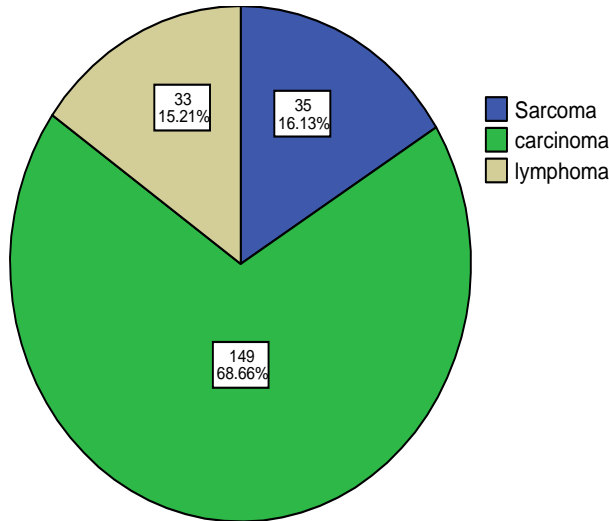
Fig. 2. Distribution by cancer types
About 66.7% of the cancer type was carcinoma

Table 2. Distribution by histologic types

Histology	Frequency	Percent
Melanoma	1	0.5
Lymphoma	32	14.7
Retinoblastoma	13	6.0
Nasopharyngeal carcinoma	26	12.0
Squamous cell carcinoma	78	35.9
Mycosis fungoides	1	0.5
Neuro-ectodermal carcinoma	2	0.9
Amyeloblastoma	5	2.3
Rhabdomyosarcoma	15	6.9
mucoepidermoid ca	14	6.5
Kaposi sarcoma	7	3.2
papillary carcinoma	7	3.2
Anaplastic carcinoma	2	0.9
Basal cell carcinoma	6	2.8
Adenocarcinoma	4	1.8
follicular carcinoma	3	1.4
Adenoidcystic carcinoma	1	0.5
Total	217	100.0

Squamous cell carcinoma is the commonest subtype constituting 35.9% followed by lymphoma 14.7%

Table 3. Age group distribution by cancer types

Age group (yrs)	Cancer types			
	Sarcoma	Carcinoma	Lymphoma	Total
1-10	20	4	3	27
11-20	5	12	12	29
21-30	3	34	7	44
31-40	3	26	3	32
41-50	0	24	7	31
51-60	1	28	0	29
61-70	3	16	1	20
71-80	0	4	0	4
81-90	0	1	0	1
Total	35	149	33	217

Sarcoma was commonest among age group 1- 10 years, carcinomas 21- 30 years and lymphomas 11- 20 years.

In this study, Sarcoma was commonest cancer among the first decade of life, followed by carcinoma and lymphoma in the third and second decades respectively. This is consistent with other researchers who reported that patients with carcinomas are older than sarcomas and lymphomas [17,38].

5. CONCLUSION

The prevalence of head and neck cancers in this study is 16.54%. Most cancers are epithelial in origin and squamous cell carcinoma predominate with a male to female ratio of 2.2:1. Most of the studies on head and neck cancers in Nigeria are hospital base. In this study, 60.83% of patients were aged 40 years and below. Despite this huge burden, head and neck cancers are still not on the priority list of government evidenced by lack of appropriately equipped, purpose build radio-oncology center in the northeast zone of Nigeria.

There is the urgent need therefore for a population based study in Nigeria to determine the exact incidence of head and neck cancers. This will help in planning and establishment of an oncology center for education, screening, early detection, prevention and control of head and neck cancers.

Head and neck cancers are not uncommon in our environment and the common health problems of the youth, this fact open an opportunity for further search of aetiological agents.

CONSENT

It is not applicable.

ETHICAL APPROVAL

Ethical approval was sort from the ethical committee of the University of Maiduguri Teaching Hospital.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Opubo B da Lilly-Tariah, Abayomi O Somefun, Wasiu L Adeyemo. Current evidence on the burden of head and neck cancers in Nigeria. Head & Neck Oncology. 2009;1:14.
2. Ferlay J, Shin HR, Bray F, Forman D, Mathers CD, Parkin D. GLOBO-CAN 2008, Cancer incidence and mortality worldwide: IARC cancer-base No.10 [Internet]. Lyon, France: International Agency for Research on Cancer; 2010.
3. American Cancer Society. Cancer in Africa. Atlanta: American Cancer Society; 2011.
4. Saboorian MH, Ashfaq R. The use of fine needle aspiration biopsy in the evaluation of lymphadenopathy. Semin Diagn Pathol. 2001;18(2):110-23.
5. Hermans R. Head and neck cancer: How imaging predicts treatment outcome. Cancer Imaging. 2006;6:S145-53.
6. Adoga AA, Silas OA, Nimkur TL. Open cervical lymph node biopsy for head and neck cancers: Any benefit? Head Neck Oncol. 2009;1:9.
7. Warnakulasuriya S. Global epidemio-logy of oral and oropharyngeal cancer. Oral Oncology. 2009;45:309-16.

8. Amusa YB, Olabanji JK, Akinpelu VO. Pattern of head and neck malignant tumors in a Nigerian teaching hospital- A ten year review. West Afr J Med. 2004;23(4):280-5.

9. Bhatia PL. Head and neck cancer in Plateau State of Nigeria. West Afr J Med. 1990;9:304-310.

10. Gathere S, Mutuma G, Korir A, Musibi A. Head and neck cancers four year trend at the Nairobi Cancer Registry. Afr J Health Sci. 2011;19:30-35.

11. Adeyemi BF, Adekunle LV, Kolude BM, Akang EE, Lawoyin JO. Head and neck cancer- A clinicopathological study in a tertiary care center. J Natl Med Assoc. 2008;100(6):690-7.

12. Sankaranarayanan R, Masuyer E, Swaminathan R, Ferlay J, Whelan S. Head and neck cancer: A global perspective on epidemiology and prognosis. Anticancer Res. 1998;18(6B):4779-86.

13. Mehanna H, Paleri V, West C, Nutting C. Head and neck cancer–Part 1: Epidemiology, presentation, and prevention. BMJ. 2010;341(7774):663-6.

14. Onyango JF, Macharia I. Delays in diagnosis, referral and management of head and neck cancer presenting at Kenyatta National Hospital, Nairobi. East Afr Med J. 2006;83:85-91.

15. Onyango JF, Awange DO, Njiru A, Macharia IM. Pattern of occurrence of head and neck cancer presenting at Kenyatta National Hospital Nairobi. East Afr Med J. 2006;83:288-91.

16. Otoh E, Johnson NW, Olasoji H, Danfillo I, Adeleke O. Intra-oral carcinomas in Maiduguri, North-Eastern Nigeria. Oral Diseases. 2005;11(6):379-85.

17. Ajayi O, Adeyemo W, Ladeinde A, Ogunlewe M, Effiom O, Omitola O, et al. Primary malignant neoplasms of orofacial origin: A retrospective review of 256 cases in a Nigerian tertiary hospital. International Journal of Oral and Maxillofacial Surgery. 2007;36(5):403-8.

18. Effiom OA, Adeyemo WL, Omitola OG, Ajayi OF, Emmanuel MM, Gbotolorun OM. Oral squamous cell carcinoma: A clinicopathologic review of 233 cases in Lagos, Nigeria. Journal of Oral and Maxillofacial Surgery. 2008;66(8):1595-9.

19. Alvarenga LdM, Ruiz MT, Pavarino-Bertelli ÉC, Ruback MJC, Maniglia JV, Goloni-Bertollo M. Epidemiologic evaluation of head and neck patients in a university hospital of Northwestern São Paulo State. Revista Brasileira de Otorrinolaringologia. 2008;74(1):68-73.

20. Yeole BB, Ramanakumar AV, Sankara-narayanan R. Survival from oral cancer in Mumbai (Bombay), India. Cancer Causes & Control. 2003;14(10):945-52.

21. Abiose B, Ogunniyi J, Oyejide O. Oral soft tissue malignancies in Ibadan, Nigeria. African Journal of Medicine and Medical Sciences. 1991;20(2):107-13.

22. Onyango J, Awange D, Wakiaga J. Oral tumours and tumour-like conditions in Kenya: II. Age, sex and site distribution. East African Medical Journal. 1995;72(9): 568-76.

23. Odukoya O, Mosadomi A, Sawyer DR, Orejobi A, Kekere-Ekun A. Squamous cell carcinoma of the oral cavity: A clinico-pathological study of 106 Nigerian cases. Journal of Maxillofacial Surgery. 1986;14: 267-9.

24. Swoboda H. Epidemiology of head and neck cancer in eastern Austria. Advanced Otorhinolaryngology. 1991;46:134-144.

25. Silverberg E, Boring C, Squires TS. Cancer Statistics 1990. CA Cancer Journal of Clinicians. 1990;40:9-26.

26. Nwawolo CC, Ajekigbe AT, Oyeneyin JO, Nwankwo KC, Okeowo PA. Pattern of head and neck cancers among Nigerians in Lagos. West Afr J Med. 2001;20:111-116.

27. Okoye BCC, Nwosu SO. Primary head and neck malignant tumours in Port Harcourt, Nigeria. Orient J Med. 1995;7:38-40.

28. Lilly-Tariah da OB, Nwana EJC, Okeowo PA. Cancers of the ear, nose and throat. Nig J Surg Science. 2000;10:52-56.

29. Otoh EC, Johnson NW, Danfillo IS. Primary head and neck cancers in North Eastern Nigeria. West Afr J Med. 2004;23: 305-313.

30. Ahmad BM, Pindiga UH. Malignant neoplasms of the ear, nose and throat in north eastern Nigeria. Highland Med Research J. 2004;2:45-48.

31. Iseh KR, Malami SA. Pattern of head and neck cancers in Sokoto- Nigeria. Nig J Otolaryngol. 2006;3:77-83.

32. Subhashraj K, Orafi M, Nair K, El-Gehani R, Elarbi M. Primary malignant tumors of orofacial region at Benghazi, Libya: A 17

years review. Cancer Epidemiology. 2009; 33(5):332-6.

33. Bhattacharjee A, Chakraborty A, Purkaystha P. Prevalence of head and neck cancers in the North East-An institutional study. Indian Journal of Otolaryngology and Head and Neck Surgery. 2006;58(1):15-9.

34. Nwaorgu O, Kokong D, Onakoya P, Adoga S, Ibekwe T. Prevalence of human immunodeficiency virus seropositivity in head and neck malignancies in sub-Saharan Africa. Acta Oto-Laryngol. 2007; 127:1218-1221.

35. Akcam T, Oysul K, Birkent H, Gerek M, Yetiser S. Leiomyosarcoma of the head and neck: Report of two cases and review

of the literature. Auris Nasus Larynx. 2005; 32(2):209-12.

36. Weber RS, Benjamin RS, Peters LJ, Ro JY, Achon O, Goepfert H. Soft tissue sarcomas of the head and neck in adolescents and adults. The American Journal of Surgery. 1986;152(4):386-92.

37. Penel N, Van Haverbeke C, Lartigau E, Vilain M-O, Ton Van J, Mallet Y, et al. Head and neck soft tissue sarcomas of adult: Prognostic value of surgery in multimodal therapeutic approach. Oral Oncology. 2004;40(9):890-7.

38. Larizadeh MH, Damghani MA, Shabani M. Epidemiological characteristics of head and neck cancers in Southeast of Iran. Iran J Cancer Prev. 2014;7(2):80-6.

Peer-review history:
The peer review history for this paper can be accessed here:
http://sciencedomain.org/review-history/11628