

Pattern of head and neck cancers among patients attending Muhimbili National Hospital Tanzania

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Abstract

Background: It is estimated that there are more than 640,000 new cases and 350,000 deaths due to head and neck cancers (HNCA) each year worldwide. Lack of baseline data in Tanzania concerning head and neck malignancies makes it difficult to appreciate the pattern and magnitude of the problem in the country. The objective of this study was to determine the pattern of head and neck cancers among patients attending the Otorhinolaryngology Department at the Muhimbili National Hospital in Dar es Salaam, Tanzania.

Methods: All inpatients and outpatients with histologically proven malignant lesions in the head and neck region who attended the Otorhinolaryngology department of Muhimbili National Hospital between 1st July 2012 and 31st January 2013 were enrolled in the study. A special designed questionnaire was used for data collection. Clinical examination, computed tomography scan and/or magnetic resonance image were done accordingly, followed by fine needle aspiration cytology and/or tissue biopsy.

Results: A total of 113 patients, 75 (66.3%) males and 38 (33.7.0%) females with a male to female ratio 2:1 were involved in the study. The mean age at the time of diagnosis was 51±18. Patients below age of 40 years accounted for 28.4% of all head and neck cancer patients. The commonest observed anatomical location was nasal and paranasal sinuses (23.9%) followed by the larynx (20%). Carcinoma accounted for 94% of head and neck cancers in which squamous cell carcinoma was the most frequent (74%). Lymphoma (2%) was the least frequent histological variant encountered. Nasal and paranasal sinuses had the most histological variations of all anatomical locations of head and neck cancer.

Conclusion: This study shows a significant number of head and neck cancer patients in a younger generation and a high magnitude of sinonasal cancer relative to other head and neck cancer.

Keywords: cancer, head, neck, histological variants, Tanzania

Introduction

Head and neck cancer (HNCA) refers to a heterogeneous group of primary cancers involving upper aerodigestive tract. They rank sixth among the most common cancers worldwide (Parkin *et al.*, 2005). It is estimated that 6,400,000 new cases of HNCA and 350,000 deaths occur each year worldwide (Parkin *et al.*, 2002). The aetiology of head and neck cancers like most cancers is not clear. However there are several risk factors being associated with them. Scientific evidence shows that there is a synergistic effect of alcohol consumption and tobacco use in causing head and neck cancers (Tobias, 1994). Sinonasal cancers are strongly associated with occupational or industrial risk factors, while radiation around the head and neck is associated with malignant transformation of the lesion. Epstein Bar virus and the use of salted fish have association with nasopharyngeal carcinoma (Tobias, 1994).

Clinically, head and neck cancers present with functional disturbance of upper aerodigestive tract with cervical lymphadenopathy with the exception of glottic cancer. Definitive diagnosis is through histology. Fine needle aspiration for cytology is recommended for parotid and submandibular gland tumors and neck mass of unknown primary. Imaging is important in staging and management plan of the tumor (Tobias, 1994).

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The age at diagnosis of head and neck cancers is between 9 months to 80 years with 90% of the patients being over the age of 40 years (Parkin *et al.*, 2002). Most studies have shown male preponderance in head and neck malignancies (Amusa *et al.*, 2004; Adeyemi *et al.*, 2009). The extent differs from region to region. It is reported that male to female ratio of HNCA ranged from 1.1:1 to 3.3:1 (Sankaranarayanan *et al.*, 1998). The oral cavity is the most common site for head and neck cancers accounting for up to 40% of them, however this significantly differs from region to region (Peng *et al.*, 2000; Parkin *et al.*, 2005). Histologically squamous cell carcinoma has been shown to be the most common type accounting for about 70% of the HNCA (Peng *et al.*, 2000).

In developing countries, the true magnitude of HNCA is still questionable because of lack of consistent data. In Tanzania, there is no any report on the magnitude and profile of HNCA despite having a good number of patients with such cancers. The objective of this study was to determine the pattern of head and neck cancers among patients attending the Otorhinolaryngology Department at the Muhimbili National Hospital in Dar es Salaam, Tanzania.

Materials and Methods

Study design and participants

This was a hospital based descriptive cross-sectional study was carried out from July 2012 and January 2013 and included all patients with histological diagnosis of malignant lesions in head and neck who attended the Otorhinolaryngology Department of Muhimbili National Hospital in Dar es Salaam, Tanzania. Include a summary of the MNH profile as suggested by one of the reviewers.

Data collection and laboratory analyses

The socio-demographic data, the clinical examination findings, Computerized Tomography (CT)/Magnetic Resonance Imaging (MRI) reports and histological results of all patients with histological diagnosis of head and neck cancer were obtained through hospital registries, computerized database and patient files. All the information was counterchecked and corrected where necessary by using special designated coded questionnaire to interview the patient about socio-demographic data. The clinical examination findings from the files were further discussed and reviewed by otorhinolaryngologist, head and neck surgeon then filled in special form which consisted of different head and neck anatomical sites, the CT-scans/MRI were reviewed by otorhinolaryngologists, the histology was done and reviewed by a pathologist and filled in another special form comprising of histological diagnosis.

Data analysis

Continuous variables were summarized by medians and interquartile ranges and categorical variables were summarized by frequency and percentage. Data was analyzed using SPSS software for Windows version 16.0.

Ethical considerations

Patients were provided with an informed consent and then asked to provide written consent to participate in the study. This study was approved by the Research and Publication Committee of the Muhimbili University of Health and Allied Sciences.

Results

Patient characteristics

Between 1st July 2012 and 31st January 2013 a total of 3,658 patients were attended at the Department of Otorhinolaryngology in Muhimbili National Hospital. Of these, 113 (3%) patients had histological diagnosis of various head and neck malignant tumors. The study subjects consisted of 75 (66.3%) males and 38(33.7%) females, with a male to female ratio of 2:1. The age at the time of

diagnosis ranged from 16years to 88 years (mean age= 51 years \pm 18). Those aged 41-60years accounted for the majority of cases (42%). Patients above 40 years of age accounted for 72.6% while patients below 40years accounted for 28.4%. Patients with head and neck cancer below 20 years constituted 5.3% (Table 1).

Table 1: Distribution of patients with head and neck cancers by age and sex

| Age group (years) | Male | | Female | | Total | |
|-------------------|------|------|--------|------|-------|-------|
| | No. | % | No. | % | No. | % |
| 0-20 | 5 | 4.4 | 1 | 0.9 | 6 | 5.3 |
| 21-40 | 15 | 13.3 | 10 | 8.8 | 25 | 22.1 |
| 41-60 | 32 | 28.3 | 16 | 14.2 | 48 | 42.5 |
| 61-80 | 22 | 19.5 | 6 | 5.3 | 28 | 24.8 |
| >80 | 1 | 0.9 | 5 | 4.4 | 6 | 5.3 |
| Total | 75 | 66.3 | 38 | 33.7 | 113 | 100.0 |

Anatomical site of HNCA

A total of seven anatomical locations were found in the analysis of 113 patients with HNCA (Table 2). Sinonasal cancer was the most frequent HNCA 27(24.7%) followed by cancer of larynx 23(20.4%), nasopharyngeal and hypopharyngeal cancer each 16 (14.2%), oral cavity cancer was 12 (10.6%) oropharyngeal cancer was 11 (9.7%) the least location was a parotid gland cancer 7 (6.2%).

Histological types

Of all malignant tumors, 107 (94.7%) of HNCA histology were carcinoma, 4 (3.5%) were sarcoma and 2(1.8%) were lymphoma. Squamous cell carcinoma was the most frequent of all cancers. Eighty-four (74.3%) patients had squamous cell followed by mucoepidermoid (6.2%), adenoid cystic carcinoma (5.3%), adenocarcinoma (3.5%), undifferentiated carcinoma and olfactory neuroblastoma (2.7%) each, and the least frequent was lymphoma 2(1.8%) (Table 2). Squamous cell carcinoma accounted for 94%, 91%, 88% and 87% of hypopharyngeal, oropharyngeal, nasopharyngeal and laryngeal cancer, respectively. Sinonasal cancer showed the most histology diversity than any other HNCA.

Table 2. Distribution of head and cancer by anatomical location and histological diagnosis

| Site | Number and percent (%) of Histological diagnosis | | | | | | | | |
|---------------|--|-----------|---------|---------|---------|---------|---------|---------|-----------|
| | ADNCY | SCC | SCM | MUCO | ONBSM | ADENO | LYM | UC | Total |
| Oral cavity | 3 (2.7) | 6 (5.3) | 2 (1.8) | 1 (0.9) | - | - | - | - | 12 (10.6) |
| Oropharynx | 1 (0.9) | 10 (8.8) | - | - | - | - | - | - | 11 (9.7) |
| Sino nasal | 1 (0.9) | 16 (14.2) | 2 (1.8) | - | 3 (2.7) | 2 (1.8) | 2 (1.8) | 2 (1.8) | 27(24.7) |
| Nasopharynx | 1 (0.9) | 14 (12.4) | - | 1 (0.9) | - | - | - | - | 16 (14.2) |
| Hypopharynx | - | 15 (13.3) | - | - | - | - | - | 1 (0.9) | 16 (14.2) |
| Parotid gland | - | 3 (2.7) | - | 4 (3.5) | - | - | - | - | 7 (6.2) |
| Larynx | - | 20 (17.7) | - | 1 (0.9) | - | 2 (1.8) | - | - | 23 (20.4) |
| Total | 6 (5.3) | 84 (74.3) | 4 (3.5) | 7 (6.2) | 3 (2.7) | 4 (3.5) | 2 (1.8) | 3 (2.7) | 113 |

Keys: ADNCY=adenoid cystic carcinoma, SCC=squamous cell carcinoma, SCM=sarcoma, MUCO=mucoepidermoid carcinoma, ONBSM=olfactory neuroblastoma, ADENO=adenocarcinoma, LYM=lymphoma, UC=undifferentiated carcinoma

In cancers of larynx mean age at diagnosis was 55 \pm 18 years with the most frequent age group between 41-60 years. About 87% of the cancers of larynx were diagnosed above the age of 40 years. There were no patient in the <21 years and >80 year groups with cancer of larynx. There were more cases of cancers of the larynx among males (87%) than females (13%), giving a female to male ratio of 1:6.7 (Table 3).

Table 3: Distribution of cancer of larynx by age and sex

| Age | Number (%) Males | Number (%) Females | Total |
|-------|------------------|--------------------|-----------|
| 0-20 | 0 (0.0) | 0 (0.0) | 0 (0.0) |
| 21-40 | 2 (8.7) | 1 (4.3) | 3 (13.0) |
| 41-60 | 10 (43.5) | 2 (8.7) | 12 (52.2) |
| 61-80 | 8 (34.8) | 0 (0.0) | 8 (34.8) |
| >80 | 0 (0.0) | 0 (0.0) | 0 (0.) |
| Total | 20 (87.0) | 3 (13.0) | 23 |

Discussion

In this study about three-quarters of the patients were above 40 years of age and the majorities were aged between 41 and 60 years. This is in concurrence with several other African studies which also showed that head and neck cancers occur more common in patients above 40 years (Onyango, 2006; Nwawolo *et al.*, 2002). Similar findings have been reported in Tanzania and elsewhere in Africa (Ajay, 1981; Mann, 1990; Adeyemi *et al.*, 2008). A slight male preponderance encountered in this study is in agreement with what has been reported in other studies (Altumbabić *et al.*, 2008). Males tend to have a higher exposure to the commonly known predisposing factors for head and neck cancers.

There is a diversity of anatomical sites included under the broad group “head and neck cancer”. For example Onyango *et al.* (2006) included eye and thyroid cancers, while Adeyem *et al.* (2008) did not separate oral cavity and oropharynx cancers. Occurrence of cancers at various sites in the body differs from one place to another even in the same country. However a study in Nigeria reported nasopharynx, sinonasal and larynx as the most common anatomical sites involved in head and neck cancers (Da Lilly Tariah *et al.*, 2009). On the other hand, the nose and paranasal air sinuses were the commonest locations in this study. Similar findings have been reported in a study Nigeria (Ologe *et al.*, 2005). However, most of the studies in West Africa and China reported the nasopharynx to be the most common anatomical site (Nwaorgu *et al.*, 2007; Ahmad & Pindiga, 2004). A study done in Kenya (Onyango *et al.*, 2006) and Bosnia (Altumbabić *et al.*, 2008), found the larynx to be the most frequent anatomical location. Contrary to the findings of this study, oral cavity cancers were reported as the most frequent head and neck cancer in a study by Sanghvi *et al.* (1989). This could be attributed to higher behavioral tendency of chewing tobacco in India and Pakistan. In our setting, patients with oral lesions are also attended in oral-surgery department hence there is a higher possibility of missing the true number of patients with oral cancers.

In 1980s, cancer of the larynx was the most prevalent cancer followed by nasopharynx at the Otorhinolaryngology Department at Muhimbili National Hospital (Muhimbili National Hospital Report, unpubl.). Our study shows that there is a tremendous increase in the number of cases of sinonasal cancer attended at the hospital. Submandibular and sublingual gland cancers were not found in this study. For the case of submandibular gland cancer, this could be explained by the time limitation of the study or missing some candidates because some of them are attended in oral surgery department. Similar to our study findings, sublingual cancers have been reported to very rare elsewhere in East Africa (Onyango *et al.*, 1992).

The broad histological types of malignancies in this study were carcinomas. This is in concurrence with available literature from Africa and elsewhere (Silverberg *et al.*, 1990; Swoboda, 1991). In a 10 year review, Amusa *et al.* (2004) reported lymphomas as the predominant histological type followed by squamous cell carcinomas and sarcomas. The consideration of squamous cell carcinoma as the only epithelial malignancy in their study may have resulted in the perceptible dominance of lymphomas. Similar to our findings, in the USA, carcinomas were reported to account for majority of the cases of head and neck cancers. However, the criteria for inclusion of cancers vary and lesions like sarcomas and neuroendocrine tumours were not clearly specified.

The cancer of larynx in our study showed the male preponderance similar to the findings in a study in Nigeria (Amusa *et al.*, 2011). This is attributed to the dominance of tobacco use in male population than female. In this study there were no patients diagnosed with cancer of larynx above 80 years of age and this could be explained due to the shorter life expectancy of Tanzanians and hence very few people were available for the study with that age group (URT, 2013). Also it was observed that the male to female ratio decreases in patients with the diagnosis of cancer of larynx in younger generation.

In conclusion, this study shows that head and neck cancers are among the common health problems affecting Tanzanians at relatively younger age. Sinonasal cancer was found to be the commonest site while squamous cell carcinoma was the most common histological variant.

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