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Prevalence of Nasopharyngeal Carcinoma among Patients with Nasopharyngeal Mass in a Philippine Tertiary Training Hospital

ABSTRACT

Objectives: To determine the prevalence and identify the types of Nasopharyngeal Carcinoma (NPCA) among patients with nasopharyngeal mass seen at a tertiary university training hospital in the Philippines from January 2006 – July 2012 and identify possible factors associated with nasopharyngeal carcinoma.

Methods: A retrospective cross-sectional study was performed at a tertiary university training hospital among cases (n=179) seen with nasopharyngeal mass at the ENT outpatient department. Histopathology results and patient medical charts were collected and reviewed after IRB approval. The age at diagnosis, sex, place of residence, occupation and chief complaint was compared among patients with positive histopathology of NPCA only.

Design: Retrospective, cross sectional study
Setting: Tertiary Private University Training Hospital
Participants: One hundred seventy nine (179) patients with nasopharyngeal mass

Results: Ninety six (54%) cases with nasopharyngeal mass seen at the ENT outpatient department were positive for nasopharyngeal malignancy. The remaining 83 (46%) cases with nasopharyngeal mass had a benign histopathology. NPCA was more common among males (58%) than females (42%). The most common form of NPCA was non-keratinizing undifferentiated NPCA (47%) followed by poorly differentiated squamous cell carcinoma in 18 (19%). The most common chief complaint was a neck mass, followed by decreased hearing.

Conclusion: There was a higher proportion of nasopharyngeal malignancy among male patients with nasopharyngeal mass, and the most common chief complaint was a neck mass. Future research should integrate data with other hospital institutions to obtain more accurate demographic data of the local prevalence of NPCA. A detailed record of the ethnicity, diet, occupation, smoking history and family history of cases should be obtained to correlate possible risk factors of NPCA among patients with nasopharyngeal mass in our setting.

Keywords: *nasopharyngeal carcinoma, nasopharyngeal mass, epidemiology, prevalence*

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Ear, Nose and Throat (ENT) Physicians see patients who consult for diverse chief complaints in the head & neck with subsequent finding of a nasopharyngeal mass. If with clinical suspicion for nasopharyngeal carcinoma, biopsy is advised to rule out a malignant process. However, there is little evidence that a nasopharyngeal biopsy should be performed in the presence of a nasopharyngeal mass. Nasopharyngeal Carcinoma (NPCA) is an epithelial neoplasm arising most often from the fossa of Rosenmüller.[1] It represents about 0.7% of global cancer with an age-standardized incidence rate for both males and females of <1 per 100,000 person-years. Incidence rates are much higher (10-20 per 100,000 person- years in males, 5-10 per 100,000 person-years in females) in Cantonese regions of Southern China and Southeast Asia.[2] In Manila (Philippines), the incidence rates from 1993 - 1997 were 7.2 per 100,000 person-years among males and 2.5 per 100,000 person-years in females.[3] In contrast, the Philippine Cancer Society reported an incidence of 1.2 per 100,000 person years in 2010, while a recent study by Sarmiento and Mejia found an incidence of 2.07 per 100,000 person years.[4] These studies show variying incidences and data for NPCA in the country.

The objective of this study is to determine the prevalence, classify the types of NPCA and associate the potential risk factors for Nasopharyngeal Carcinoma among patients with nasopharyngeal mass at a tertiary univeristy training hospital from January 2006 to July 2012.

METHODS

With institutional review board approval, this retrospective cross-sectional study considered all patients seen at the ENT outpatient service under the clinical (public) division of a tertiary university training hospital in Manila from January 2006 to July 2012 who were diagnosed with a nasopharyngeal mass for the first time and on whom subsequent nasopharyngeal biopsy was performed.

Histopathologic examinations were performed at the Department of Anatomic Pathology of the same institution and reviewed by different assigned pathologists. Group concurrence among a particular set of pathologists was applied if there were issues with difficult to diagnose cases. Each entire specimen or a representative sample processed and stained with Hematoxylin - Eosin was examined under high power and low power scanning magnification. For this study, only the initial histopathology result was considered, and no special stains were considered for inconclusive histopathology results.

Histopathologic results and medical records of patients were collected by the principal investigator. The age at diagnosis, sex, place of residence, occupation and chief complaint were recorded and correlated among patients with positive histopathology of NPCA only. The prevalence of NPCA based on the 1991 WHO classification was also determined. Records with incomplete data were excluced.

Data Analysis

The data gathered was encoded in Microsoft Excel version 14.0 worksheet (Office 2010, Microsoft Corporation, Redmond, WA, USA) and tallied in SPSS version 10 (SPSS-X) for Windows (SPSS Inc. 1983, Chicago, IL, USA). Descriptive statistics were generated for all variables. For nominal data frequencies and percentages were computed. For numerical data, mean ± SD were generated. Analysis of the different

Table 1. Table 1. Histologies of biopsied nasopharyngeal masses at the ENT-OPD from January 2006 – July 2012 (*n*=179)

	n	%
Malignant Histologies	**96**	**54**
Nasopharyngeal carcinoma (81.3%)		
Undifferentiated carcinoma	45	47
Non-keratinizing carcinoma1	18	19
Keratinizing carcinoma2	6	6
Squamous cell carcinoma, grade not specified	9	9.3
Other carcinomas (1%)		
Adenoid cystic carcinoma	1	1
Lymphoid malignancies (7.3%)		
Non-Hodgkin's lymphoma	2	2.1
Atypical lymphoid proliferation	5	5.2
Malignant neoplasm, unspecified (10.4%)		
Undifferentiated malignancy	7	7.3
Round cell malignancy	3	3.1
Benign Histologies	**83**	**46**
Inflammatory lesions (86%)		
Acute inflammation	1	1
Chronic inflammation	54	65
Caseating granulomatous inflammation	7	8
Lymphoid hyperplasia	9	11
Others3	1	1
Benign neoplasms (6%)		
Cystadenoma lymphomatosum	1	1
Angiofibroma	3	4
Polyp	2	2
Benign nasopharyngeal tissue (6%)	5	6

[1]Poorly differentiated (squamous cell) carcinomas
[2]Moderately and well-differentiated (squamous cell) carcinomas
[3]Non specific inflammation with focal dysplasia; reactive (lymphoid) hyperplasia

variables was done using the t-test to compare groups with numerical data and chi square test to compare/associate nominal data.

RESULTS

Records of 179 patients were included in the study with ages ranging from 18-80 years old (mean age 48 years). Of the 179 total cases of nasopharyngeal mass, 96 (54%) were reported as malignant while 83 (46%) were reported as benign. A total of 78 (81.3%) had a histopathologic diagnosis of NPCA. Among those with NPCA, the most common form was non-keratinizing undifferentiated NPCA (47%) followed by non-keratinizing poorly differentiated Squamous Cell carcinoma (19%). Other malignant histopathology results (18.7%) include adenoid cystic carcinoma, non-Hodgkins lymphoma, undifferentiated malignancy, round cell malignancy and atypical lymphoid proliferation.

Among the benign nasopharyngeal histologies, the most common was chronic inflammation (65%). *(Table 1)*

Table 3 shows the association of age and sex with nasopharyngeal malignancy. There was a significant association of nasopharyngeal malignancy with higher mean age compared to benign biopsy results ($p < 0.0001$). The proportion of males was significantly higher among those with nasopharyngeal malignancy ($p < 0.03$).

There was a peak in the incidence of undifferentiated nasopharyngeal carcinoma at age 41-50 years old. *(Figure 1)* The age of patients with nasopharyngeal malignancy was significantly higher/older than those with benign nasopharyngeal mass.

The most common reported chief complaint among patients diagnosed with Nasopharyngeal Carcinoma was a neck mass, followed by decreased hearing. Other symptoms include decreased hearing, epistaxis, nasal obstruction, tinnitus, ear pain, facial pain, foreign body sensation on throat, palatal mass & headache.

Table 2. Distribution of nasopharyngeal carcinomas according to stage (AJCC 2010, 7th Edition)

	n	%
I	1	1
II	1	1
III	8	10
IVA	7	9
IVB	5	6
IVC	3	4
X	51	65
No stage	2	4
TOTAL	78	100

Table 3. Association of age and sex with nasopharyngeal malignancy

	Nasopharyngeal Malignancy (n=96)	Non-Malignant Nasopharyngeal Mass (n=83)	P value
Age (in years)			
Mean ± SD	47.90 ± 13.64	34.28 ± 14.97	<0.0001 (S)
Sex			
Female	42 (41.6%)	47 (57.3%)	0.03 (S)
Male	59 (58.4%)	35 (42.7%)	

DISCUSSION

Of the 179 cases with nasopharyngeal mass included in the study, 96 cases (54%) had a malignant nasopharyngeal mass. Of these, 78 (81.3%) were positive for NPCA and the most common classification in our study was non-keratinizing undifferentiated NPCA. In comparison, a 1991 study by Uy on the clinical profile of 108 patients diagnosed with nasopharyngeal carcinoma at the University of Santo Tomas Hospital

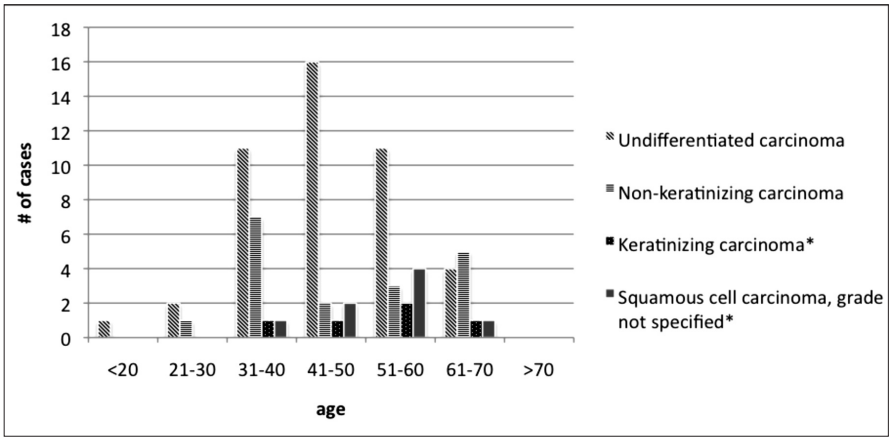

Figure 1. Distribution of Nasopharyngeal Carcinomas According to Subtypes and Age

from 1971-1983 showed that poorly differentiated carcinoma was the most common histopathology diagnosis at that time (44%), and the least common was undifferentiated NPCA (14%).[5] Among the cases included in his study, a diagnosis of NPCA was three times more common among males compared to females.[5] Also, a 1996 study by Uy and Chiong at the Manila Doctors Hospital of 98 patients with nasopharyngeal mass seen at their institution from 1989-1993 showed that 52% had positive histopathology of NPCA while 48% had negative results.[6]

The significant association noted in our study between age and sex of patients with nasopharyngeal malignancy ($p < 0.0001$ and < 0.03 respectively) is consistent with the review of literature which shows that NPCA incidence increases with increasing age in high and intermediate risk countries, while a consistent pattern of bimodality in NPCA age incidence was observed in *low risk* populations (increase in NPCA risk with an early peak in late adolescence (15-24 years old) and a second peak later in life (65-79 years old)).[7] In our study, we note that there was a peak in the incidence of NPCA at age 41-50 years old. The bimodal distribution of age found in other studies was not seen here. Could the peak incidence in a younger age group in our study be explained by differences in circumstances and environments -- where variations in dietary intake of food such as dried fish (a nitrosamine rich diet) may be more accessible to the lower socioeconomic group? Could more exposure to environmental pollution from occupation and lifestyle have affected the younger aged group with peak prevalence of NPCA compared to the older population?

Our results showed a greater proportion of males with histopathology of nasopharyngeal carcinoma, consistent with previous studies done in high-prevalence countries. We note however that compared to most studies with a male to female ratio of 2-3:1, there was a higher ratio of females diagnosed with nasopharyngeal carcinoma among the patients in our study (male to female ratio of 1.4:1). Could the increasing incidence of smoking among local females have something to do with this?

In our study, non-keratinizing undifferentiated carcinoma (47%) was the most common form of nasopharyngeal carcinoma, consistent with studies done in other high risk countries. Poorly differentiated squamous cell carcinoma was the second most common form (19%), in contrast to studies in other high risk countries where this form is rare. Keratinizing squamous cell carcinoma is usually found in low risk countries like United States and Japan, and is associated with smoking. With our results showing a higher proportion of females diagnosed with NPCA compared to previous studies on the epidemiology of NPCA in the Philippines, future research on the probable role of smoking and other unique factors among females in the Philippines may be useful.

NPCA is curable but is usually diagnosed at a late stage. Patients have multiple symptoms and a painless upper cervical lymph node is the most common presenting feature followed closely by nasal symptoms particularly, blood stained post nasal drip.[1,6,8] In comparison, the most common chief complaint among patients who were eventually diagnosed with nasopharyngeal carcinoma at our institution was a neck mass followed by decreased hearing. Perhaps closer scrutiny of the nasopharynx in patients with conductive hearing problems and otitis media effusion may increase detection of NPCA in our setting.

Limitations of our study include our small sample size. Due to the retrospective nature of the study, incomplete data in some charts limited the data collection. Variability in biopsies performed by different ENT doctors may also have affected our results.

This paper is only an initial evaluation of the prevalence of NPCA among patients seen in the clinical (public) division of our institution. It is recommended that future researches include the private division of the hospital as well, and should consider including other hospitals/ health facilities to obtain more accurate data of the prevalence of NPCA in the Philippines. Detailed information on the ethnicity, dietary practices, occupational exposures and family history of NPCA should be obtained for all patients suspected of having nasopharyngeal carcinoma, using an NPC screening questionaire. Complete and organized patient records may provide better references for future research and answer some of the questions this study raised.

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