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Frequency Of Malignancy Among Major Salivary Glands Neoplasm in a Tertiary Level Hospital, Dhaka, Bangladesh

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Abstract

Background: Major salivary gland tumours are an uncommon type of tumours with a variety of morphologies. Due to ethnic and geographic diversity, the tumours' clinicopathological characteristics also vary.

Objective: To find out the malignancy among major salivary glands neoplasm.

Methods: This cross-sectional study was carried out at the Department of ENT and Head Neck Surgery at Dhaka Medical College Hospital, Dhaka from July 2019 to December 2020, for a period of one and a half years. A total of 44 consecutive patients with major salivary gland neoplasms of all ages and sexes were enrolled. A detailed history, physical examination, FNAC, CT scan, MRI, USG, and histological examination of the operated specimen were used to diagnose the neoplastic lesion.

Results: Maximum affected patients were in 3rd and 4th decade. Females (54.5%) were predominant than males (45.5%). Maximum patients were from rural area (59.1%). Maximum patients were poor (65.9%). Most commonly involved salivary gland was the Parotid gland (79.5%). Prevalence of malignancy was 31.8%. Frequency of malignancy in parotid gland was 31.4% and in sub-mandibular gland was 33.3%. Most common malignancy in major salivary glands neoplasm was Mucoepidermoid carcinoma (42.9%) followed by adenoid cystic (21.4%), Acinic cell carcinoma (14.3%), adenocarcinoma (14.3%) and carcinoma ex pleomorphic (7.1%).

Conclusion: Frequency of malignancy was 31.8% in major salivary glands neoplasm. Frequency of malignancy in parotid gland and sub-mandibular glands were 31.4% and 33.3% respectively.

Keywords: Major Salivary Glands Neoplasm, Malignancy, Bangladesh

Introduction

The salivary glands are divided into 2 groups i.e., the major salivary glands and the minor salivary glands. The major salivary glands consist of the following 3 pairs of glands: the parotid glands, the submandibular glands and the sublingual glands. The minor salivary glands comprise 600-1000 small glands distributed throughout the upper aerodigestive tract [1]. Salivary gland tumors (SGTs) are a heterogeneous group of neoplasms in the maxillofacial area with complex morphologic appearance and different clinical behavior. These salivary gland neoplasms are relatively uncommon, comprising 3-6% of all head and neck neoplasms in various reports [2, 3, 4]. However, they are an important issue in the science of head and neck pathology, due to their difficult diagnosis, management and unpredictable clinical course of disease. Etiologic factors of this group of neoplasms have not been recognized exactly however; Ionizing radiation, sunlight, chemotherapy, smoking and vitamin A deficiency have been pointed out in the literature [5, 6]. These tumors have inconsistent characteristics in different countries and it seems that geographic location and ethnic factors may affect clinicopathologic profile of these tumors [7, 8]. The incidence of salivary gland neoplasms as a whole is approximately 3.3 cases per 100, 000 individuals in Israel, with malignant neoplasms accounting for 1.1 cases per 100, 000 [9]. The annual incidence of salivary gland neoplasms ranges from 0.5 to 2 per 100, 000 in different parts of the world [10]. The sex distribution for salivary gland neoplasms is equal, and the majority of the cases arise in the sixth decade [5]. The majority of these neoplasms are benign and only 20% are malignant.

In the parotid glands, 20-25% of the tumours are malignant. This rises to 40% for the submandibular gland, and more than 90% for sublingual gland [10, 11]. Most benign neoplasm of major salivary gland manifest insidiously, that is growing slowly over a long period of time without causing any other symptoms, whereas malignant neoplasm may present with rapidly enlarging swelling, pain, nerve palsy, skin invasion, neck nodes. Facial nerve paralysis is a presenting feature appears approximately one third of patients of parotid malignancy whereas submandibular gland malignancy may involve hypoglossal nerve followed by trigeminal nerve and facial nerve [3]. Diagnosis of Salivary gland neoplasm is done by proper history taking, clinical examination, Fine Needle Aspiration Cytology (FNAC) and some imaging procedures such as Computed Tomography (CT), Magnetic Resonance Imaging (MRI) or Ultrasonography (USG) [12], has become widely used in the diagnosis of salivary gland neoplasm [13]. Mortality from malignant salivary gland neoplasms varies by stage and pathology of the disease but the overall 5-year survival rate is 72% [14]. The published data regarding neoplasm in major salivary gland in Bangladesh is poorly documented. The aim of this study is to describe the frequency of neoplasm in major salivary glands in a hospital-based sample and characterizes them according to age, sex and anatomic location.

Methodology

Study design: Cross-sectional study.

Place of study: Department of ENT and Head Neck Surgery at Dhaka Medical College Hospital, Dhaka, Bangladesh.

Study period: From July 2019 to December 2020 for a period of one and half year.

Study population: All the patients presented with neoplasm of major salivary glands attended in the Department of ENT and Head Neck Surgery of Dhaka Medical College Hospital, Dhaka were selected as study population.

Sample size: A total number of 44 patients with major salivary gland neoplasm were enrolled for this study after fulfilling the inclusion and exclusion criteria.

Sample size calculation

Re-calculate

The sample size was determined by following formula

$$n = \frac{Z^2 p \times q}{d^2}$$

Where,

n = the desired sample size which would help to measure the different indicators

z=z- value of normal standard distribution, usually set at 1.96 at 5% level which corresponds to 95% confidence level.

Here,

p=0.03 (Prevalence of neoplasm in salivary glands 3-4%, [Ezeanolue, 1999]) [15].

q=1-0.03-0.97

d=0.05 (allowable error 5.0%)

So, the sample size for this study would be

$$n = \frac{(1.96)^2 \times 0.03 \times 0.97}{(0.05)^2} \approx 44$$

Final sample size was 44

Selection criteria of the study subjects

Inclusion Criteria

- Patients with major salivary glands neoplasm (cytologically proven).
- Patients of any age and any gender
- Patients who gave consent.

Exclusion Criteria

- Non-neoplastic salivary gland disease.
- Neoplasm involving minor salivary glands.
- Patient unfit for definite surgery.

Study Procedure: Patients with major salivary glands neoplasm attending the Department of ENT and Head Neck Surgery, Dhaka Medical College, during study period fulfilling the selection criteria were the study population. A total of 44 consecutive patients of all ages & sexes were enrolled. Neoplastic lesion was diagnosed by details history, physical examination, FNAC, CT scan, MRI, USG and histological examination of operated specimen (as required).

Statistical Analysis: Data were collected, compiled and tabulated according to key variables and functional assessment scoring. The analysis of different variable was done according to standard statistical analysis. Qualitative data were expressed as frequency & percentage and quantitative data were expressed as mean & standard deviation. Statistical Package for Social Science (SPSS 23.0) was used to process data.

Results

The study population consisted of 44 patients who presented with major salivary gland neoplasms in the ENT Department (indoor and outpatient) of Dhaka Medical College Hospital, Dhaka. This study aimed to discover how common malignancy was in patients with major salivary gland neoplasms.

Table 1: Demographic profile of the study subjects (n=44)

| Age (years) | Frequency (N) | Percentage |
|-------------|---------------|------------|
| 11 - 20 | 7 | 15.9% |
| 21 - 30 | 10 | 22.7% |
| 31 - 40 | 9 | 20.5% |
| 41 - 50 | 6 | 13.6% |
| 51 - 60 | 8 | 18.2% |
| 61 - 70 | 2 | 4.4% |
| 71 - 80 | 2 | 4.4% |
| Mean ± SD | 39.66 ± 17.28 | |

Table 1 shows distribution of the study subjects according to different age group. Mean age of the study subjects was 39.66 ± 17.28 years. Maximum patients were in 3rd and 4th decade.

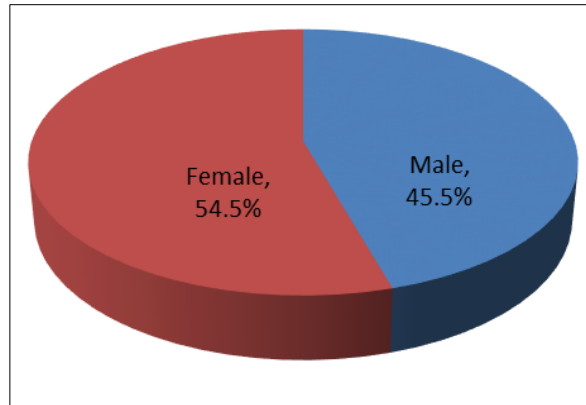


Fig 1: pie chart of the study subjects according to gender.

Females (54.5%) were predominant than males (45.5%).

Table 2: Socio-economic status of the study subjects (n=44)

| Socio-economic status | Frequency (N) | Percentage |
|-----------------------|---------------|------------|
| Poor | 29 | 65.9 |
| Middle Class | 15 | 34.1 |
| High Class | 0 | 0.0 |

Table 2 shows socio-economic status of the study subjects. Maximum patients were poor (65.9%).

Table 3: Frequency of malignancy among patients with major salivary glands neoplasm (n=44)

| | Frequency (N) | Percentage |
|-----------|---------------|------------|
| Malignant | 14 | 31.8 |
| Benign | 30 | 68.2 |

Table 3 shows prevalence of malignancy among patients with major salivary glands neoplasm. Prevalence of malignancy was 31.8%.

Table 4: Frequency of malignancy according to different glands (n=44)

| | Parotid gland (N=35) | Sub-mandibular gland (N=9) | Sub-lingual gland |
|-----------|----------------------|----------------------------|-------------------|
| Malignant | 11 (31.4) | 3 (33.3) | 0 |
| Benign | 24 (68.6) | 6 (66.7) | 0 |

Table 4 shows frequency of malignancy in different glands. Frequency of malignancy in parotid gland was 31.4% and in sub-mandibular gland was 33.3%.

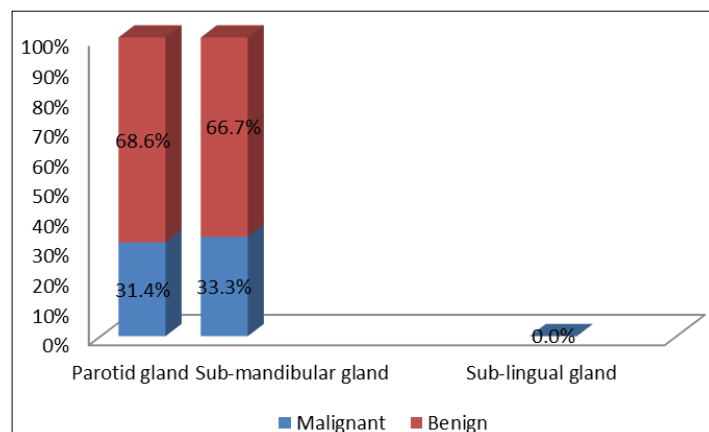


Fig 2: Frequency of malignancy in Different types of glands

Table 5: Pattern of malignancy in parotid and sub-mandibular glands (n=44)

| | Total (N=14) | Parotid gland (N=11) | Sub-mandibular Gland (N=3) |
|---|--------------|----------------------|----------------------------|
| Mucoepidermoid carcinoma | 6 (42.9) | 4 (36.4) | |
| Adenoid cystic Carcinoma ex pleomorphic adenoma | 3 (21.4) | 2 (18.2) | 1 (33.3) |
| Acinic cell carcinoma | 2 (14.3) | 2 (18.2) | 0 (0.0) |
| Adenocarcinoma | 2 (14.3) | 2 (18.2) | 0 (0.0) |

Table 5 shows histopathological findings of major salivary glands neoplasm. Most common malignancy was Mucoepidermoid carcinoma in salivary gland neoplasm (42.9%).

Discussion

This cross-sectional study was conducted to determine the frequency of malignancy among patients with major salivary gland neoplasms. For this purpose, 44 patients with major salivary gland neoplasms who visited the Department of ENT and Head & Neck Surgery (indoor and outpatient) of the Dhaka Medical College Hospital were enrolled in this study. A detailed history, physical examination, FNAC, CT scan, MRI, USG, and histological examination of the operated specimen were used to diagnose the neoplastic lesion. It can occur at any age. In this study maximum patients were in 3rd and 4th decade which is comparable to the findings of Devi & Talukdar [16], and Jain [17]. Maximum number of cases of salivary gland neoplasms occurs in 3rd decade of life [16]. De Oliveira *et al* [18] found maximum incidences in 4th decade in case of woman but in 5th decade in man. The most common age group involved in both benign and malignant tumours was 31-40 years [19]. In the study of Wahiduzzaman *et al* [20], most cases occur in 5th decade. Early presentation in this study may be due to increase awareness among people and improvement of health care system. In the present study, the neoplasms of the salivary glands were slightly higher in female than male. F:M was 1.2: 1. Similar slight female predominance was observed in the study of Mili *et al* [19], Jones *et al* [3] and Bello *et al* [9]. However, some single centers studies have reported a higher incidence of salivary gland tumours in males or an equal gender involvement [21, 22]. In our study, most commonly involved salivary gland is the Parotid gland (79.5%). This finding was similar with various literature [19, 23, 24]. In this study most of the neoplasms were benign (68.2%) and remains (31.8%) were malignant. In another study in Bangladesh by Wahiduzzaman *et al* [20] revealed the similar findings (72% benign and 28% malignant). This finding was consistent with the studies [22, 16, 25]. In this study, malignant was 31.4% and benign was 68.6% in parotid glands. Wahiduzzaman *et al* [20] showed 23.80% malignant and 76.20% benign in parotid glands. Fiorella *et al* (2005) showed 13.8% and 79.8% of their patients had malignant and benign neoplasm in parotid gland respectively. Regarding submandibular neoplasm 3 (33.3%) cases were malignant and 6 (66.7%) cases were benign in the present study. Wahiduzzaman *et al* [20] showed 50% malignant and 50% benign in sub-mandibular glands. Boukheris *et al* [21] revealed that benign and malignant tumor of submandibular glands were 40% and 50% respectively. In this study, most common malignancy in majorsalivary glands neoplasm was Mucoepidermoid carcinoma (42.9%) followed by adenoid cystic (21.4%), Acinic cell carcinoma (14.3%), adenocarcinoma (14.3%) and carcinoma ex pleomorphic (7.1%). Mucoepidermoid carcinoma was the most common carcinoma reported in the literatures [20, 25].

Conclusion

Frequency of malignancy was 31.8% in major salivary glands neoplasm. Frequency of malignancy in parotid gland and sub-mandibular glands were 31.4% and 33.3% respectively.

Limitation

There are some limitations of this study. These are as follows:

- It is a single center observational study, observer bias could not be eliminated completely.

Recommendation

Based on the findings of the present study and analysis following recommendations are put forward

- Further study with multicenter large population should be recommended.
- People who develop swelling around the maxillo-facial region should consult with an Otolaryngologist as early as possible.

Conflict of Interest

Not available.

Financial Support

Not available.

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