The Incidence Of Salivary Glands Tumours Among The Sudanese

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Between 1985 and 1995, three hundred and thirty-four cases of salivary glands tumours were reviewed. Seventy percent of them were parotid gland tumours. 20% were submandibular gland tumours and the remaining 10% were minor salivary gland tumours. The study showed a high incidence of malignant salivary gland tumours, amounting to 47% of the cases. The use of tobacco (local snuff) appears to have strong relation with this increase of malignant salivary gland tumours.

Key words: Salivary gland tumours, incidence, Epidemiology, Sudan.

Introduction

A variety of tumours occur in salivary glands, including both major and minor salivary glands. Salivary gland tumours are uncommon, with their incidence showing wide variation from one country to another and from one race to other. The reported geographical and racial variations are not substantive, but they are worth mentioning. They include:

1. In Canada the Eskimos have a higher incidence of salivary gland tumors than the general population.
2. In Malaaysia there is varying incidence associated with race, e.g. 2.3 for 100,000 Chinese and 17 for 100,000 East Indians.
3. In the USA, in the white population there is no noticeable difference in the incidence between males and females, but in the blacks there is greater incidence in females.
4. In Africans palatal tumors were found to be more common especially in those of the younger age groups.

There also seems to be a variation in the site distribution of salivary gland tumours in the different regions. Parotid tumours constitute 43.7% of salivary gland tumours in Malawi, 52.7% in Uganda, 43.6% in New York, 86% in Sweden, 85% in Malawi, and 75% in Sheffield. In Malawi the incidence of tumors occurring in the submandibular gland is higher (24%) when compared with figures coming from other regions like 13.7% in Sheffield, 6.3% in Stockholm and 6.5% in New York.

The present study shows the incidence of salivary gland tumours in the Sudan and compares it with previous studies

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The study sample consisted of 334 cases of salivary glands tumours collected from Khartoum Dental Hospital and the National Laboratory. All the salivary glands tumours were examined, diagnosed, and microscopically analyzed by qualified histopathologists working at the National Laboratory. The period covered in this study is from 1985 to 1995. The medical records of the patients were reviewed in relation to the following:

1. The type of the tumor.
2. The site of the tumor.
3. The sex and age of the patient.

Results

1. Incidence Of Different Types Of Tumors

In this series 175 cases had benign tumors. Of these 174 were pleomorphic adenomas, and the remaining one was a monomorphic tumor. There were 139 malignant tumors. Of the malignant tumors 7 cases were not classified. Of the remaining 152 tumors 77 cases were adenocarcinomas, 50 cases were adenoid cystic carcinomas, 15 cases were carcinoma in pleomorphic adenomas, 7 cases were mucoepidermoid carcinomas, 2 cases were squamous cell carcinoma and one case of a sarcoma. (Table 1)

2. Site Distribution Of The Tumors

Two hundred and thirty-four cases were parotid tumors. Of these 94 were malignant and 140 were benign. Sixty seven cases were submandibular gland tumors of which 40 of them were malignant, and the rest were benign. Out of this series 33 were minor salivary gland tumors. Of these 12 were pleomorphic adenomas, and all of them except 8 were malignant tumors. Of the palatal tumors 7 were benign and the rest were malignant tumors (Table 2).
Table 1: INCIDENCE OF DIFFERENT TYPES OF TUMORS

<table>
<thead>
<tr>
<th>Type of tumor</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pleomorphic adenoma</td>
<td>174</td>
<td>52%</td>
</tr>
<tr>
<td>Monomorphic</td>
<td>1</td>
<td>0.3%</td>
</tr>
<tr>
<td>Adenocarcinoma</td>
<td>77</td>
<td>23%</td>
</tr>
<tr>
<td>Adenoid cystic carcinoma</td>
<td>50</td>
<td>16%</td>
</tr>
<tr>
<td>Carcinoma in pleomorphic adenoma</td>
<td>15</td>
<td>4%</td>
</tr>
<tr>
<td>Mucoepidermoid carcinoma</td>
<td>7</td>
<td>2%</td>
</tr>
<tr>
<td>Squamous cell carcinoma</td>
<td>2</td>
<td>0.6%</td>
</tr>
<tr>
<td>Sarcoma</td>
<td>1</td>
<td>0.3%</td>
</tr>
<tr>
<td>Unclassified tumors</td>
<td>7</td>
<td>2%</td>
</tr>
</tbody>
</table>

Table 2: INCIDENCE OF TUMORS AT DIFFERENT SITES

<table>
<thead>
<tr>
<th>Gland</th>
<th>Benign tumors</th>
<th>Malignant tumors</th>
<th>Total %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parotid</td>
<td>140</td>
<td>59</td>
<td>34%</td>
</tr>
<tr>
<td>Submaxillar</td>
<td>27</td>
<td>8</td>
<td>16%</td>
</tr>
<tr>
<td>Minor glands</td>
<td>7</td>
<td>10</td>
<td>14%</td>
</tr>
</tbody>
</table>

Table 3: INCIDENCE OF TUMORS AT DIFFERENT SITES IN DIFFERENT COUNTRIES

<table>
<thead>
<tr>
<th>Gland</th>
<th>1972/3</th>
<th>1974/5</th>
<th>1976/7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parotid</td>
<td>49%</td>
<td>49%</td>
<td>49%</td>
</tr>
<tr>
<td>Submaxillar</td>
<td>19%</td>
<td>19%</td>
<td>19%</td>
</tr>
<tr>
<td>Minor glands</td>
<td>19%</td>
<td>19%</td>
<td>19%</td>
</tr>
</tbody>
</table>

Discussion

Very little is known about the etiologic factors responsible for salivary gland neoplasms. Some heredity on the subject consider that local or general disease of the salivary gland may occur in some cases in patients with cancer of the salivary gland. In addition, some believe that radiation may be a predisposing factor. The result of the study appears to be interesting when compared with other published studies. In most of the published studies, benign tumors comprise from 70 to 80 percent of the series and of them pleomorphic adenoma accounts for around 80 percent. In this series the benign tumors accounted for 52 percent, while the malignant tumors accounted for 48 percent. The latter percentage is remarkably high, and alarming (table 2). The adenocarcinoma was the most common malignant tumors accounting for 51% of the malignant tumors and 23% of all series (table 3). The adenoid cystic carcinoma is the next highest in frequency accounting for 33% of the malignant tumors & for 15% of all the series. This is followed by the carcinomas in pleomorphic adenoma which constitute 12% of all the series and 9% of the malignant tumors.

3. Sex And Age Distribution

One hundred and ninety nine cases of this series were males and the rest 144 cases were females. The age of the patient ranged from 6 years to 88 years. The 5th decade of life showed the highest incidence of involvement (n=134), followed by the 6th and 4th decades (n=82 & 76) respectively (chart 1).
In the study the parotid gland is the most common site of involvement as usual, and 70% of all the tumours were found in this gland. When compared with corresponding figures from previously published studies, this percentage lies at the bottom of all series. Tumours were malignant in nature, reflecting a high incidence of malignant parotid tumours, similar to the incidence reported from Malawi.

The submandibular glands tumours constituted 20% of this series and 49% of them were benign, and the remaining 51% were malignant. The latter figure is the highest of all figures reported before (table 3). On the other hand, tumours of minor salivary glands comprised 10% of all the series and 80% of these were malignant. This high incidence of malignant salivary glands in this series, could be attributed to the overall increase in oral cancer among the Sudanese patients that was reported before. An increase in the incidence of the salivary glands tumours was found by David et al in 1968, by Idris in 1991, mounting to 6 percent and 15 percent of their series, respectively. In a comprehensive epidemiological study, Idris found sufficient evidence for causal relationship between oral cancers and the use of a local snuff called toombak. Toombak is made by dissolving Natron powder in water and mixing it with tobacco powder. The product is usually placed by the users in the lower labial sulcus. The risk of developing cancer was several times greater among those using toombak users reaching 69 percent. In other words, about two third of the cases of oral cancer in the Sudan were associated with the use of toombak. Thus it is a big doubt that there is a relation between oral cancer and the habit of using toombak. The amount of tobacco specific nitrosamine (TSNA) in Sudanese toombak was found to be the highest in the world. Late years also found that the Sudanese snuff dippers have a significant difference in the ability to activate 4-(methylnitrosamino)-1-(pyridyl)-1-butanone (NNK), as well as having potential differences in their cancer risk.

In addition to the habit of dipping toombak, in this part of the world the patients usually come for treatment rather late with a very large mass. It has been shown by Zhang (that mixed tumors with long preoperative duration (> or =6 years) are characterized by an increase in both the diploid and aneuploid (AN) pattern of the DNA, as compared to that with short (> or =3 years) preoperative duration (p=0.01) . The same study showed that mixed tumours with the size > 2.5 cm have more aneuploid (AN) pattern of DNA than that with size > or = 2.5 cm (p=0.01). Those results indicate that the risk of malignancy transformation in a mixed tumor increases as it grows, and the larger the tumour or the longer its duration the more the likelihood for transformation into malignancy. Also we have noticed that some of these pleomorphic adenomas seen here in the Sudan appears to be more aggressive than usual, a feature that supports the study mentioned above, and warrants further investigation. These findings might explain the high incidence of carcinoma in pleomorphic adenoma in our series. The association between oral cancer and the use of toombak was strongest for cancers of the lip, buccal and floor of the mouth. Elsheikh et al found that 59 out of 62 patients with oral squamous cell carcinoma were toombak dippers and the cancer developed at the site where the material was placed.

As the latter usually placed in the lower labial sulcus, this might explain the high incidence of malignancy of the minor salivary glands (table), where they are exposed to the toombak ingredients and other solvents that may enhance the process of carcinogenesis.

The majority of patients in this series were in their 5th decade of life, and the bulk of them were between 40 and the 6th decade of life. The male predominated the sexes, with a ratio of 1:3. No age group appears to be immune from these tumors and the figures concerned lie within the rage shown in the previous studies.

Conclusion and recommendations

The findings of the present study although in some aspects similar to other published studies, showed a remarkable increase in the incidence of salivary glands malignancy among the Sudanese people. Many factors appear to have a role in this increase. Of them might be the following:

1. The high levels of TSNA found in Sudanese toombak.
2. The large size and the prolonged duration of the tumours when the patients present.
3. The descembral aggressiveness of pleomorphic adenoma in some of these patients. It is important to educate people to seek treatment immediately whenever a swelling near the ear , in the submandibular area or inside the mouth is seen. The diagnosis of a salivary gland neoplasm must be strictly considered in these patients until proved otherwise. It is also important to encourage people to give up the habit of dipping toombak.

Acknowledgement

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