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Epidemiological profile of salivary gland lesions diagnosed in a higher education institution: an observational and retrospective study of 381 cases

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ABSTRACT. The aim of this retrospective and observational study was to report the prevalence and characteristics of salivary gland lesions (SGL) in patients treated at the State University of Maringá, between 1995 and 2018. Data from medical records of patients with neoplastic and non-neoplastic SGL concerning to age, sex, ethnicity, anatomical location, microscopic diagnosis and treatment were collected. All SGL with diagnosis confirmed by microscopic examination were considered. Of the 3,127 biopsied lesions, 381 (12.1%) SGL were identified. Caucasian (71%) women (51%) aging from 11 to 20 years (33%) were more affected. 88.5% (n= 337) were non-neoplastic lesions, 7% (n= 27) benign neoplasms and 4.5% (n= 17) malignant neoplasms. Mucocele was the most prevalent lesion (n= 269%), followed by pleomorphic adenoma (n= 25%). Recognition and appropriate management of these lesions is essential, especially because malignant neoplastic lesions of the salivary glands can be very aggressive.

Keywords: salivary glands; epidemiology; diagnosis

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Introduction

Salivary glands are contained within the scope of dentistry field, and knowledge of the pathologies that may affect these structures is essential. The clinician must recognize these lesions to establish the diagnosis¹ and plan the treatment. Malignant lesions, in particular, can have a relentless course when diagnosis is delayed and can lead to serious sequelae and death. In addition, the study of the epidemiological profile of a population has a great relevance for the planning, implementation and evaluation of public health policies aimed at preventing and treating these injuries (Moreira et al., 2009; De Melo et al., 2013; Ito, Ito, Vargas, Almeida, & Lopes, 2005; Dias Netto, Medrado, & Reis, 2006). Epidemiological studies facilitate understanding of the prevalence, extent and severity of oral diseases in a population. They allow the implementation of preventive measures to ensure the reduction in the number of cases (De Melo et al., 2013) as well as to improve the quality of life of the assisted population.

The prevalence of salivary gland lesions (SGL) varies worldwide. In a study on neoplastic SGL, Campolo González et al. (2018) found that 49% were primary salivary gland tumors, of which 80% were benign and 20% malignant.

Hill (2002) studied 135 salivary gland tumors and noted that there were differences in prevalence between these lesions, depending on the anatomical site. The parotid gland, for example, showed a higher prevalence of mucoepidermoid carcinoma when compared to the submandibular gland (Hill, 2002). On the other hand, in a multicenter study, in a total of 1,706 lesions diagnosed in pediatric patients, mucocele was more frequent (64%), and the most affected site was the lip (34.5%) and mandible (19.9%) (Silva et al., 2018).

Pleomorphic adenoma is known as the most prevalent SGL among benign neoplasms. For malignant neoplasms, mucoepidermoid carcinoma and cystic adenoid carcinoma are the most common. In general, the major salivary glands are the most affected, especially the parotid, followed by the submandibular gland. Among the minor salivary glands, the palatines are more reported (Barbosa, Meireles, Guimarães, & Costa, 2005; Kayembe & Kalengayi, 2002; Neville, Damm, Allen, & Bouquot, 2006).

Considering the importance of epidemiological studies and their role in disease prevention and treatment, the aim of this retrospective and observational study was to report the prevalence and characteristics of salivary gland lesions (SGL) in patients treated at the State University of Maringa, between 1995 and 2018.

Material and methods

After ethical approval (CAAE 70683817.4.0000.0104), this observational and retrospective study was conducted in accordance with the Declaration of Helsinki guidelines.

Data from medical records of patients referred to the Service of Oral Diagnosis of the State University of Maringa (LEBU/UEM) from 1995 to 2018 were collected. Demographic (age, sex, ethnicity) and clinical data (anatomical location, microscopic diagnosis and treatment) of patients with neoplastic and non-neoplastic SGL were recorded.

Inclusion criteria were all neoplastic or non-neoplastic lesions in the major and minor salivary glands¹⁶ with diagnosis confirmed by microscopic examination. Only patients with complete records were included.

A database with variables was organized in Microsoft Excel 2010 program for tabulation and statistics. Data were evaluated through frequency and distribution tables, using the SPSS (Statistical Package for Social Sciences) software version 22.0 (SPSS Inc., Chicago, IL, USA).

Results

Of the 3,127 biopsies performed between 1995 and 2018, 381 (12.1%) were SGL. 337 (88.5%) were non-neoplastic lesions, 27 (7%) benign neoplasms, and 17 (4.5%) malignant neoplasms.

There was a slight preference for women, as 49% of cases were diagnosed in men and 51% in women. Regarding age, the second and third decades of life were the most affected, with 33% and 18.7% of cases, respectively. For ethnicity, 269 were Caucasians (71%), 69 blacks (18%), 38 mulattoes (10%) and only 5 yellow (1%).

Mucocele was the most common lesion (n=269, 70.6%), followed by pleomorphic adenoma (n=25, 6.56%), oral ranula (n=22, 5.77%), sialadenitis (n=15, 3.93%), sialolithiasis (n=12, 3.14%), salivary duct cyst (n=11, 2.88%), mucoepidermoid carcinoma (n=6, 1.57%), necrotizing sialometaplasia (n=6, 1.57%), adenocarcinoma (n=2, 0.52%), Sjögren syndrome (n=2, 0.52%); acinic cell carcinoma (n=1, 0.26%), polymorphous low-grade adenocarcinoma (n=1, 0.26%), canalicular adenocarcinoma (n=1, 0.26%) and ductal papilloma (n=1, 0.26%) (Table 1).

Table 1. Prevalence of SGL

SGL	N	%
Mucocele	269	70.60
Pleomorphic Adenoma	25	6.56
Ranula	22	5.77
Sialadenitis	15	3.93
Sialolithiasis	12	3.14
Salivary Duct Cyst	11	2.88
Adenoid Cystic Carcinoma	7	1.83
Mucoepidermoid Carcinoma	6	1.57
Necrotizing Sialometaplasia	6	1.57
Adenocarcinoma	2	0.52
Sjögren Syndrome	2	0.52
Acinic Cell Carcinoma	1	0.26
Polymorphous Low-Grade Adenocarcinoma	1	0.26
Canalicular Adenocarcinoma	1	0.26
Ductal Papilloma	1	0.26

The inferior lip (78%) was the most affected anatomical site. In most cases, the treatment recommended (90.5%) was excisional biopsy.

Discussion

Epidemiological studies are essential because nutritional factors, habits, geographical position and socioeconomic status of a population considerably influence the incidence of oral diseases. In the literature, SGL have a high prevalence (Moreira, et al., 2009; Campolo González et al., 2018; Silva et al., 2018; Neville et al., 2016), which was consistent with the findings of this study, in which 12.1% of all biopsied cases were SGL.

The predilection for women is frequently reported in several epidemiological studies worldwide (Moreira et al., 2009; Campolo González et al., 2018; Silva et al., 2018; Neville et al., 2016; Saghravanian, Ghazi, & Saba, 2013; Sando et al., 2016); we found a slight difference between sexes, with 51% of lesions in female patients. In a retrospective study conducted in China (Valstar et al., 2017), among 2,508 patients diagnosed with salivary gland tumors, the prevalence was subtly higher (50.4%) in men. Regarding anatomical site, the lower lip was the most affected region, followed by palate. It can be explained since mucocles were the most common lesions and their site is strongly predominant in the lower lip (Neville et al., 2016; Saghravanian et al., 2013). The palate is a frequent site for neoplastic lesions of minor salivary glands (Neville et al., 2016; Saghravanian et al., 2013).

Mucocele, ranula and salivary duct cyst are similar lesions that constituted a large part (over 75%) of the lesions identified in this study. Mucocele was the most prevalent lesion (70%), and the second decade of life was the most affected age group. The lower lip (78%), lower side of the tongue (11%) and jugal mucosa (7%) were the most common sites, with no predilection for sex. It is known that mucocele commonly affects children and young adults (Silva et al., 2018; Wang, Meng, Hou, & Huang, 2014), corroborating the findings of this study.

Ranula was diagnosed in 22 patients (5.7%), being the third most prevalent SGL in this investigation. The salivary duct cyst is considered a true developmental cyst (Wang, et al., 2014), and was diagnosed in 11 patients (2.8%). As in the mucocles, the lower lip was the most affected site (45.5%), and the second decade of life was the most prevalent age group (45.5%).

Benign salivary gland neoplasms were more frequent in the fourth decade of life (29.6%), which corroborates other studies (Moreira, et al., 2009; Campolo González et al., 2018; Silva et al., 2018; Neville et al., 2016; Saghravanian et al., 2013). Malignant neoplasms were more diagnosed in male patients (52.9%) in the sixth decade of life (29.4%), corroborating other studies (Barbosa et al., 2005; Neville et al., 2016; Saghravanian et al., 2013; Sando et al., 2016; Santos et al., 2003; Ferrell, Mace, & Clayburgh, 2019).

The literature is unanimous regarding the higher frequency of pleomorphic adenoma among benign neoplasms (Moreira et al., 2009; Campolo González et al., 2018; Silva et al., 2018; Neville et al., 2016; Saghravanian et al., 2013; Valstar et al., 2017), in agreement with the findings of the present study, in which this lesion represented 92.5% benign tumors. Special attention should be given, as these lesions may exhibit aggressive behavior as well as malignant transformation (Sando et al., 2016).

Regarding the prevalence of malignant neoplasms, some studies show a higher frequency of adenoid cystic carcinoma (Ferrell et al., 2019), while others report mucoepidermoid carcinoma as the most common (Moreira et al., 2009; Ferrell et al., 2019; Sood, McGurk, & Vaz, 2016; Lee, Tong, Patel, Satyadev, & Christensen, 2016). We found that adenoid cystic carcinoma was the most prevalent malignant tumor (41.1%), followed by mucoepidermoid carcinoma (35.2%). Adenoid cystic carcinoma is a slow-growing, aggressive and invasive lesion, with high rates of perineural infiltration, leading to a poor prognosis (Wang et al., 2014; Sood et al., 2016). All cases diagnosed as malignant neoplasms in the present study were referred for treatment with the head and neck surgeon.

Other pathological entities related to salivary glands, such as sialadenitis, sialolithiasis, Sjögren's syndrome, ranula and intraductal papilloma, had a lower predominance for the study period. For some of these cases, the reduced predominance is probably due to the treatment of these entities, which often does not require a surgical approach with subsequent microscopic examination.

Conclusion

In summary, the prevalence of SGL was 12.1%, with 88.5% non-neoplastic lesions, 7% benign neoplasms and 4.5% malignant neoplasms. Mucocele was markedly the most prevalent lesion, followed by pleomorphic adenoma, a benign neoplasm. It is of fundamental importance to establish the definitive diagnosis, so that the treatment plan is executed early, especially in cases where malignant neoplasms are identified.

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