Brief Report

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The Prevalence of Odontogenic Cysts and Tumors in Babol, North of Iran

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ABSTRACT

BACKGROUND AND OBJECTIVE: Odontogenic cysts and tumors exclusively develop in the jaws from odontogenesis tissues. Given the importance of the early diagnosis and proper treatment, the present study aimed to determine the prevalence of these lesions in a population from the North of Iran during a 22-year survey.

METHODS: This cross-sectional study was conducted by investigating the records in the archives of Shahid Beheshti Hospital of Babol affiliated with the Department of Pathology of School of Dentistry from 1990 to 2012. The demographic features of the subjects including age, gender, anatomic pathology and clinical and pathological lesions were collected in the form of data which were recorded and evaluated.

FINDINGS: Out of a total of 8956 samples with oral lesion dysfunctions, 317 cases of odontogenic cysts and 53 cases of odontogenic tumors were discovered which belonged to 205 men (55.4%) and 165 women (44.6%). The mean age of these patients was 15.15 ± 28.75 years (ranging from 2 to 79 years). Among the cysts, radicular cyst accounted for the highest prevalence (67.8%) while ameloblastoma was the most frequent odontogenic tumor (82.6%). Moreover, the lesions most commonly developed in the maxillary anterior and the posterior mandibular region, respectively.

CONCLUSION: According to the results of this study, the incidence of odontogenic tumors is lower compared to the incidence of odontogenic cysts in the north of Iran.

KEY WORDS: *Odontogenic Tumor, Odontogenic Cyst, Ameloblastoma, Radicular Cyst, Dentigerous Cyst.*

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Introduction

Odontogenic cysts and tumors are lesions that surgeons, radiologists and pathologists face and their prevalence is totally different in various populations. Thus, recognizing their set out holds a great value in determining the differential diagnoses (1, 2). Odontogenic cysts are the most prevalent tumors of the jaw originating from odontogenic epithelium. Normally, they are generated from the activation of odontogenic cells which are trapped in the bone or gum.According to the classification of the World Health Organization (WHO), these cysts could be divided into two main groups of inflammatory and developmental cysts depending on their pathogenesis (3). Developmental and inflammatory odontogenic cysts are both epithelial by origin having a tendency to expand and grow. Despite the benign nature, these cysts are capable of reaching a susbtantial size. As a result, an accurate diagnosis is paramount for the proper surgical treatment (2, 4).Odontogenic tumors are generated from the epithelium, mesenchyme or the dental mesenchymal tissues. They are a heterogeneous group consisting of hamartomatous lesions with benign or malignant neoplasms. Determining the frequency of such tumors based on the patient's age and gender and their occurrence location is essential to the diagnostic and treatment plans (5, 6) since they tend to appear as clinically asymptomatic while they are normally followed by such complications as dilation and destruction of the jaws and tooth dislocation (7, 8). The frequency of these lesions varies in different communities. Therefore, findings regarding their prevalence based on the age and gender as well as their anatomic location are diverse. Since research in this area is scarce in our country, especially in the north of Iran, the present study aimed to determine the prevalence of odontogenic cysts and tumors during 22 years in the city of Babol located in the north of Iran and compare the results with other studies.

Methods

This study was conducted by investigating the oral pathology reports of Shahid Beheshti Hospital (dating from 1990 to 2012) and Babol School of Dentistry's Department of Oral Pathology (dating from 2003 to 2012). In this study, we only included odontogenic cysts and tumors and other items were excluded.We extracted the demographic features of the patients from the reports including their age, gender, tumor location, type of odontogenic cyst (incremental-dentigerous, eruption, odontogenic keratocytes (OKC), inflammatory, radicular and residual), various types of tumors (epithelial odontogenic, combined odontogenic and mesenchymal odontogenic). Afterwards, the demographics were registered in checklists by an expert. The patients were divided into different age groups of 0-10, 11-20 and 51-60 years old. The collected data were analyzed by descriptive statistics using the SPSS software V.18 and $p<0.05$ was considered as significant.

Findings

In total, 8956 cases of oral and maxillofacial lesions were extracted from the hospital records of the pathology archives of Babol Shahid Beheshti Hospital and School of Dentistry dating from 1990 to 2012. In these records, there were 317 cases of odontogenic cysts (3.5%) and 53 cases of odontogenic tumors (0.59%). The samples belonged to 205 (55.4%) male patients and 165 (44.6%) female patients.

The mean age of these cases was 15.09±28.75 years old ranging from 2 to 79 years. Furthermore, among the patients diagnosed with odontogenic cysts there were 179 men (55.4%) and 144 women (46.6%) with a mean age of 15.09±28.85 years. After dividing the subjects into six age groups, the most prevalent odontogenic cysts were observed within the age group of 21-30 years with 92 patients (29%) (table 1).

Table 1. Frequency of Various Odontogenic Cysts in different Age groups

Groups / Cysts	0-10 N(%)	11-20 N(%)	21-30 N(%)	31-40 N(%)	41-50 N(%)	51-60 N(%)
OKC						
Dentigerous	14(16.9)	31(37.3)	27(32.5)	7(8.4)	3(3.6)	1(1.2)
OKC	-	14(21.9)	28(43.8)	8(12.5)	11(17.2)	3(4.7)
Calcific	2(9.5)	9(42.9)	3(42.9)	3(14.3)	3(14.3)	1(4.8)
Inflammatory						
Radicular	5(8.4)	20(21.1)	21(22.1)	18(18.9)	16(16.8)	10(10.6)
Residual	2(4.3)	11(23.9)	10(21.7)	10(21.7)	7(15.2)	6(13.0)

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Additionally, in a total number of 317 cases of odontogenic cysts, the cyst was located in the maxilla in 130 cases (41%) while it was detected in the mandibular in 185 cases (58.4%) and it was bilaterally located in the mandibular in case of 2 patients (0.6%). Didividing the subjects by gender, the frequency of developmental odontogenic cysts accounted for 46 cases (22.4%) of dentigerous cysts, 41 cases (20%) of OKC, 9 cases (4.4%) of calcifying cysts, 52 cases (25.4%) of radicular cysts and 25 cases (12.2%) of residual cysts in the male subjects.

On the other hand, the prevalence of odontogenic tumors in the patients ageing from 2 to 68 years comprised of 30 men (56.6%) and 23 women (43.4%). The highest frequency was observed within the age group of 21-30 years, accounting for 16 patients (2.30%) (fig 1).

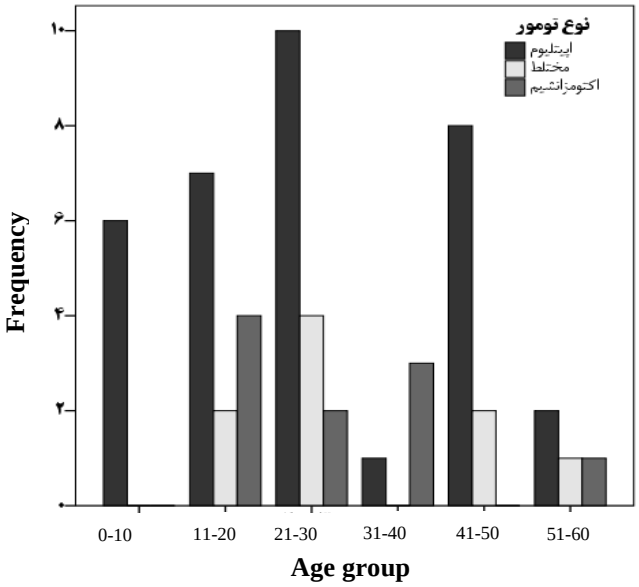


Figure 1. Frequency of Tumors according to the Age group of Patients

The most common site of incidence was determined as the mandibular with the occurance rate of 46 cases (86.8%) while 7 tumors (13.2%) were located in the maxilla.

In this regard, amloblastom was found to be the most prevalent of all tumors (26 cases) (Table 2). The highest incidence of this tumor was observed in the age group of 21-30 years (8 cases) and its most common site was the mandibular (25 cases).

The most frequent location of these lesions was in the maxillary anterior and posterior mandibular region. The clinical and pathological correspondence was 72.6%.

Table 2. Frequency of Odontogenic Tumors based on the Gender of the studied patients

gender / Type of tumor	Men N(%)	Women N(%)
Epithelial odontogenic tumor	23(67.6)	11(32.4)
Ameloblastoma	26(82.6)	7(63.6)
Carcinoma Clear cell odontogenic	1(4.3)	-
Adenomatoid odontogenic tumor	2(8.7)	2 (18.2)
Calcifying epithelial odontogenic tumor	1(4.3)	2(18.2)
combined odontogenic tumor	5(55.6)	4(44.4)
Ameloblastic fibroma	2(40)	-
Complex odontoma	3(60)	4(100)
ecto mesenchymal odontogenic tumor	2(20)	8(80)
Odontogenic fibroma	2(100)	7(87.5)
Odontogenic Myxoma	-	1(12.5)

Discussion

In the present study, 0.59% of all the oral lesions consisted of odontogenic tumors the ratio of which was lower compared to two other studies conducted in Nigeria and Zahedan (44.4%) (7, 9). Furthermore, the prevalence of odontogenic cysts was higher in male subjects compared to the female ones in the present study which is a finding consistent with those of the studies conducted in India, Turkey, Spain and Italy (2, 3, 4, 10) while inconsistent with those of another study conducted in Brazil (9). In the current survey, odontogenic tumors were mainly observed in men which is a finding compatible with that of the studies of China and Brazil (1, 11) while differring from that of another study performed in Zahedan (7). According to previous studies conducted in other countries, 7-15.2% of all the oral biopsies consist of odontogenic cysts which is compatible with the findings of the current study (10, 12). However, this rate is lower compared to the findings of the study of Spain (33.8%) (4).

In the current study, odontogenic cysts for the most part occured within the age range of 21-30 years (N=61, 35.1%) and the patients ageing from 5 to 79 years had a mean age of 14.69 ± 28.77 years. In another study performed in India, the mean age of the patients was 28 years and the second decade of life was determined as the most frequent phase of tumor occurence with 52 cases (33.9%) (3). In addition, the mean age of the subjects in the studies of China and Spain was 32.1 and 42 years, respectively which was higher than the mean

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age in the present study (1, 4). The majority of the odontogenic tumors (N=16, 30.2%) occured within the age range of 21-30 years which is a finding similar to those of the studies of India and Nigeria (6, 9). For another thing, the mean age of the patients in our study was lower than that of the Brazilian study (5).

In this study, the most frequent odontogenic cyst was reported to be the radicular which is consistent with the studies conducted in other countries (2-4, 9 , 10 , 13). Moreover, dentigerous cysts and OKC were considered as the second and third most common cysts in this study which is compatible with the studies of India, Italy and Brazil (3, 10, 11). In the present study, the most common odontogenic site was mandibule which was consistent with some studies conducted in this regard (14, 15) while it was inconsistent with the results of the studies of India, Brazil and Chile (3, 12, 16). Additionally, the posterior mandibular was considered as the most common site of odontogenic cysts in our study which is similar to the findings of another study performed in Iran (8). In our study, the most prevalent tumors were reported to be ameloblastoma, odontogenic fibroma and the complex odontoma. Considering ameloblastoma as the most frequent tumor in the current study is compatible with the results of the studies in other countries (9, 13, 17-20). In 2005, WHO classified OKC (also known as keratocyst odontogenic tumor (KOT) under the category of odontogenic tumors while in the current and aforementioned studies, OKC was categorized as an odontogenic cyst (21). Despite the fact that Jing et al. categorized KOT as an odontogenic tumor, ameloblastoma was considered as the first of odontogenic tumors (1).

By contrast, other studies regarded KOT as the most common odontogenic tumor and ameloblastoma was in the second place (5, 22). On the other hand, odontoma is reported to be the most prevalent odontogenic tumor in the United States of America. In our study, ameloblastoma and odontogenic tumors were the second and third most prevalent tumors, respectively (23). It is also noteworthy that KOT was classified as an odontogenic tumor in the U.S. Apparently, such differences are due to the classification of the odontogenic tumors and overall, ameloblastoma is considered to have a high prevalence compared to other tumors.

For the most part, odontogenic tumors appear as asymptomatic. As a result, many patients suffering from large and destructive tumors like ameloblastoma may not seek medical advice. This is perhaps the justification for the high prevalence of ameloblastoma in many countries including Iran. On the other hand, although odontoma is noticeably prevalent in America and some European countries, it is less likely to occur in Africa, India, Sri Lanka, Turkey and Iran (24, 25). Such differences in the findings are often due to the ethnical, racial and geographical variations.

However, some studies suggest that the absence of clinical symptoms as well as the patients' unwillingness to refer to medical centers are the reasons behind the lower frequency of tumors as reported by the countries with a less favorable economic situation (1, 16, 24, 26). In support of this, a Nigerian study regarded ameloblastoma as the most prevalent odontogenic tumor (similar to the African and Asian reports, in contrast with America and most of the European studies), as odontoma rarely occurs in this country. It is also noteworthy that malignant odontogenic tumors are not uncommon in Nigeria (9). In the present study, the mandibule was considered as the most common site of odontogenic tumor incidence which was compatible with the studies reporting ameloblastoma as the most prevalent odontogenic tumor and the mandibule as the most frequent site of occurrence (9, 18, 20, 21). Furthermore, based on the current study, the majority of ameloblastoma tumors tend to develop in the posterior mandibular which was also consistent with the findings of Okada and colleagues (18).

Comparing the findings of the current study with other research conducted in this regard, it is presumed that odontogenic tumors are less prevalent in the north of Iran. However, the frequency of odontogenic cysts reported in this study was compatible with the results of several other studies. The difference in the frequency of such lesions might be due to the differences in the sample size of the research. The timely diagnosis of these lesions needs to be based on a coordination between clinical, radiological and pathological findings.

As a collaboration between clinicians and pathologists is required, adequate knowledge of the clinical and histological behaviors as well as the changeable frequency of these lesions is crucial for their early detection and treatment. The current study contains essential demographic information on odontogenic cysts and tumors which could be used as the basic data by further studies on this subject

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