Journal of
Babol University of Medical Sciences
JBUMS
e-ISSN: 2251-7170 p-ISSN: 1561-4107

Comparison of Knowledge of General Dentists in Babol about Odontogenic Cysts and Tumors

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Article Type

Research Paper

Received:
Jan 20th 2024
Revised:
Mar 16th 2024
Accepted:
Apr 3rd 2024

ABSTRACT

Background and Objective: Odontogenic cysts and tumors constitute an important part of pathological lesions of the mouth, jaw, and face. These lesions have diverse frequencies, clinical behaviors, and radiographic characteristics, which can be useful in correct diagnosis of these lesions and treating them appropriately. The aim of the present study was to investigate the knowledge of general dentists in Babol about odontogenic cysts and tumors.

Methods: In this descriptive-analytical cross-sectional study which was conducted in 2023, the level of knowledge of general dentists working in offices and clinics in Babol about cysts and odontogenic tumors was assessed using a questionnaire. The questionnaire included 11 questions related to cysts and 9 questions related to odontogenic tumors, with one point awarded for each correct answer.

Findings: In this study, the knowledge of 117 dentists was assessed, of which 19 (16.2%) had good knowledge, 76 (65%) had average knowledge, and 22 (18.8%) had poor knowledge. The knowledge of tumors was lower than that of cysts ($p<0.001$). There was no statistically significant difference in the knowledge based on gender, age, and work experience.

Conclusion: The results of this study show that the knowledge of dentists in Babol about cysts is at an average level and about odontogenic tumors is at a poor level.

Keywords: *Dentists, Knowledge, Odontogenic Cysts, Odontogenic Tumors.*

Cite this article: Barzegar M, Seyedmajidi S, Bijani F. Comparison of Knowledge of General Dentists in Babol about Odontogenic Cysts and Tumors. *Journal of Babol University of Medical Sciences*. 2025; 27: e25.

Introduction

Familiarity with lesions of the oral and maxillofacial region and knowledge of their formation, treatment, and prognosis are among the skills that dentists learn during their education. Various lesions and tumors may involve the bones and soft tissues of these areas, among which cysts and odontogenic tumors are an important group.

Odontogenic cysts are epithelial-lined pathologic cavities that are relatively common in the jawbones and are classified into two groups: inflammatory and developmental. Odontogenic tumors arise from neoplastic proliferation of epithelial or mesenchymal cells of tooth-forming tissues and, although less common than cysts, are of great importance (1).

The periapical cyst is the most common odontogenic cyst and is an inflammatory type of cyst associated with an infected non-vital tooth. Among the developmental cysts, the dentigerous cyst, which is associated with the crown of an impacted tooth, is the most common lesion (2). Other odontogenic cysts include buccal bifurcation cyst, residual cyst, vegetative cyst, neonatal and adult gingival cyst, lateral periodontal cyst, odontogenic keratocyst, orthokeratinized odontogenic cyst, calcified odontogenic cyst, and glandular odontogenic cyst (3). Odontogenic cysts can cause bone and soft tissue swelling, tooth loosening, fistula formation, pain, and paresthesia (4). Teeth associated with cysts sometimes lose their viability, and it is also not possible to save viable teeth during surgery in some cases (5). Some of these cysts may have an invasive or recurrent behavior (5), or some, such as odontogenic keratocysts, may exhibit tumor-like behavior (6). Tumorous and carcinomatous changes in the epithelial wall of some odontogenic cysts have also been reported (7).

Odontogenic tumors are mostly benign, yet some of them have an aggressive behavior. These tumors are divided into three categories based on the tissue of origin: epithelial, mixed, and ectomesenchymal, and sometimes their definitive diagnosis is challenging (8). Odontoma is the most common odontogenic tumor of mixed origin, which itself is seen in two types: compound and complex. Some researchers do not consider it a true tumor and consider it a hamartoma (9). Among other odontogenic tumors, ameloblastoma, which is an epithelial tumor, is the most common and is seen in solid or multicystic, unicystic, and peripheral types. This tumor has an infiltrative behavior and is locally invasive. Subtypes of this tumor that have malignant changes and metastasis include malignant ameloblastoma and ameloblastic carcinoma (10). Other types of odontogenic tumors include adenomatoid odontogenic tumor, calcifying epithelial odontogenic tumor, clear cell odontogenic carcinoma, squamous odontogenic tumor, ameloblastic fibroma, ameloblastic fibroadenoma, ameloblastic fibrosarcoma, primordial odontogenic tumor, odontogenic fibroma, granular cell odontogenic tumor, and odontogenic myxoma (1).

Odontogenic cysts are usually removed by enucleation and curettage, but in cases of recurrence and invasiveness, conservative treatments may not be sufficient (5). Odontogenic tumors also respond to conservative surgery in some cases, but in types such as ameloblastoma, recurrence is high and invasive treatments such as jaw resection are required (10). The recurrence rate in tumors such as adenomatoid odontogenic tumor is very low, and recent molecular studies suggest that this lesion is classified as a hamartoma (11).

Correct and timely diagnosis of odontogenic cysts and tumors and knowledge of their treatment and prognosis by general dentists is of great importance and has a significant impact on the aesthetics and function of the jaws in patients. The present study was conducted to assess the level of knowledge of general dentists working in Babol, northern Iran, about odontogenic cysts and tumors.

Methods

This cross-sectional study was conducted among general dentists in Babol in 2023 after approval by the Ethics Committee of Babol University of Medical Sciences with the code IR.MUBABOL.REC.1401.137. Based on the surveys conducted, the total number of general dentists in Babol was 167, and considering the acceptable participation rate of 70%, 117 dentists ultimately participated in this project. Dentists who had a doctorate in general dentistry and were employed in offices and clinics in Babol were included in the study and were excluded if they did not cooperate or filled out the questionnaire incompletely.

The research method was as follows: after selecting the dentists via telephone calls and setting an appointment, they were visited in their offices or workplaces and given the necessary and comprehensive explanations about the study. The questionnaire was provided to the participants in printed form and they were given sufficient time and were asked to answer the questions with sufficient time and patience and without mentioning their names. In this study, to measure the level of knowledge, the questionnaire by Kalbasi Gharavi et al., whose validity and reliability in the Iranian society had been confirmed, was used with a series of changes and amendments under the supervision of related experts (12).

The questionnaire consisted of three sections: 1. Demographic information of the participant including age, gender, work experience, and university of study, 2. Questions about odontogenic cysts (11 multiple-choice questions), and 3. Questions about odontogenic tumors (9 multiple-choice questions).

The questionnaires were corrected and questions with a correct answer were given a score of 1 and questions with no answer or incorrect answer were given a score of 0, resulting in scores ranging from 0 to 20. The average total score of the questionnaire was divided into three equal parts and the participants' level of knowledge was reported in three levels: good, average, and poor. The score ranges for cysts, tumors, and the total score in this category are shown in Table 1.

Table 1. Classification of knowledge based on score range related to cysts and tumors (12)

Score / Level	Cyst	Tumor	Total
Good	8-11	7-9	14-20
Average	4-7	4-6	7-13
Poor	0-3	0-3	0-6

The data obtained from this study were analyzed using SPSS version 22. In addition to presenting the data using descriptive statistics, the Paired Samples T-Test was used to compare the knowledge scores of the study participants regarding odontogenic cysts and tumors, and the Independent Samples T-Test and ANOVA were used to compare the knowledge scores by gender, age, and work experience, and $p<0.05$ was considered significant.

Results

A total of 117 general dentists from Babol were included in this study, 66 of whom were male (56.4%) and 51 were female (43.6%). The mean age of male participants was 38.21±11.19 years and female participants was 32.54±6.64 years. In terms of work experience, 71 (60.7%) had less than or equal to 5 years, 25 (21.4%) had between 6 and 15 years, and 21 (17.9%) had 16 years or more of experience. The results of data analysis showed that regarding cysts, the level of knowledge of 18 (15.4%) of the study participants was poor, 69 (59%) average, and 30 (25.6%) good. Regarding tumors, the level of knowledge

of 56 (47.9%) of the study participants was poor, 47 (40.2%) average, and 14 (12%) good (Figure 1). The frequency of dentists with average and good knowledge in the field of cysts was significantly higher than in the field of tumors ($p<0.001$). Overall, the level of general knowledge about cysts and tumors was assessed as poor in 22 (18.8%), average in 76 (65%) and good in 19 (16.2%) participants.

By examining the average scores of the level of knowledge about cysts and odontogenic tumors by gender, the results showed that there was no significant difference between the two genders in terms of the level of knowledge. Furthermore, in terms of work experience, the results showed that there was no significant relationship between the different groups with the level of knowledge in this regard. In examining the relationship between the level of knowledge and age, the results also showed that there was no significant relationship between these two variables. The frequency of correct answers to each question can be seen separately in Table 2.

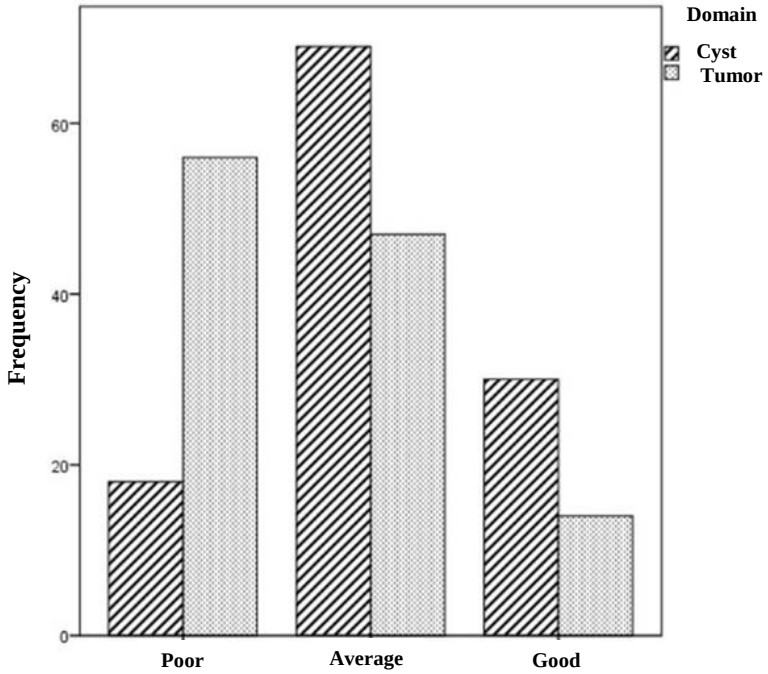

Figure 1. Comparison of dentists' level of knowledge regarding odontogenic cysts and tumors

Table 2. Frequency of correct answers to each question in the cyst and tumor domains

Domain	Question No.	Question	Number(%)
Cyst	1	Which of the following cysts is most common?	79(67.5)
Cyst	2	Which of the following cysts is most likely to develop with an impacted tooth?	82(70.1)
Cyst	3	Which of the following cysts has the highest recurrence rate?	60(51.3)
Cyst	4	Which of the following cysts has an infectious origin?	25(21.4)
Cyst	5	Which odontogenic cyst is most likely to develop malignancy?	53(45.3)
Cyst	6	What is the most important factor in differentiating cysts of infectious origin from those of developmental origin?	55(47)
Cyst	7	Which cyst is most likely to be seen as a single-cavity radiolucency at the apex of a nonvital tooth?	72(61.5)

Cyst	8	Which cyst in the mandible is most common in the posterior ramus region and has multiple cavities on radiolucency?	54(46.2)
Cyst	9	Which cyst is connected to cementoenamel junction (CEJ)?	63(53.8)
Cyst	10	Which cyst is the second most common periapical radiolucency, after periapical granuloma?	66(56.4)
Cyst	11	After treatment of which cyst, the patient needs more clinical and radiological follow-up?	68(58.1)
Tumor	12	Which is the most common odontogenic tumor?	62(53)
Tumor	13	Which of the following tumors have conservative treatment?	39(33.3)
Tumor	14	Which type of ameloblastoma has a lower age prevalence?	55(47)
Tumor	15	Which type of ameloblastoma is the least common?	44(37.6)
Tumor	16	Which of the odontogenic tumors is most often considered a developmental anomaly (hamartoma)?	53(45.3)
Tumor	17	Which odontogenic tumor is more aggressive than the others?	35(29.9)
Tumor	18	Which odontogenic tumor can have a mixed radiographic appearance (lucent and opaque)?	50(42.7)
Tumor	19	Where is malignant ameloblastoma metastasis most commonly seen?	52(44.4)
Tumor	20	Which odontogenic tumor is composed of numerous small, tooth-like structures?	66(56.4)

Discussion

The results of data analysis showed that the knowledge of most participating dentists regarding cysts was moderate and was poor regarding tumors, which is similar to the study by Kalbasi Gharavi et al. in Isfahan (12). We did not find any similar study that measured the level of knowledge about odontogenic cysts and tumors; however, the level of knowledge of dentists about oral cancer was also reported to be average in studies conducted by Nazar et al. in Kuwait, Ojha et al. in Nepal, Akhondi et al. in Yazd, and Ala Aghbali et al. in Urmia (13-16). Only in the study by Abdal et al. in Ilam, the level of knowledge of dentists about oral cancer was reported to be above average (17). The issue that has been seen in various studies that dentists' theoretical knowledge is not at a desirable level may be due to the fact that this group's attention is focused on performing practical treatments in the field of dental restoration and reconstruction, and they may not be sufficiently attentive to other oral cavity lesions.

Among the questions asked of the participants, the most correct answers were related to the association of dentigerous cyst with impacted teeth, the most common odontogenic cyst, and periapical cyst in the form of a single-cell radiolucency at the end of a non-vital tooth. Given the high prevalence of these cases, 30 to 40% incorrect answers to these questions are also noteworthy. In contrast, the fewest number of correct answers to questions were about cysts of infectious origin, the most aggressive odontogenic tumor, and tumors requiring conservative treatment, respectively.

Lack of knowledge about the infectious origin of cysts can lead to unnecessary prescription of antibiotics, resulting in antibiotic resistance, and delayed treatment in patients. In addition, almost half of the responding dentists were not properly informed about the factor that distinguishes infectious from developmental cysts, which can lead to unnecessary root canal treatment or extraction of teeth adjacent to the cyst.

Poor knowledge about invasive tumors and the need for conservative treatment is also of great importance among dentists, as general dentists are trusted advisors to their patients and in many cases, patients consult them about specialized treatments. Lack of knowledge about how to treat different tumors can lead to misinformation being given to patients, which can lead to unwarranted concerns or, conversely, a lack of attention to the proposed treatment, both of which can cause irreparable harm to patients in the future.

In the studies conducted, no significant difference was observed in terms of the level of knowledge among different age, gender, and work experience groups; however, in all these groups, the level of knowledge of odontogenic tumors was lower than that of cysts, which can be justified given the lower prevalence of odontogenic tumors, resulting in less exposure of dentists to these lesions. Compared to the study by Kalbasi Gharavi et al., the lower level of knowledge of tumors was similar to that of cysts, but in the study conducted in Isfahan, people with more work experience reported a higher level of knowledge than others, which was not similar to our results (12).

Considering average and poor knowledge regarding odontogenic lesions, and given that the questions were about clinical appearance, radiography, and treatment, and no question was asked about microscopic appearance, special attention needs to be paid in this regard. Since these topics are taught theoretically and practically in different sections of the general dentistry curriculum, changing the lesson plan or educational units may not improve the situation.

Many dentists update their knowledge in the scientific and practical fields during the years after graduation, and those with active practice licenses are required to earn annual retraining points, but such retraining is not calculated separately for different specialized fields.

It seems that dentists are more interested in retraining that teaches about various therapeutic techniques for repairing and reconstructing teeth and surrounding tissues, so information about oral lesions is neglected, and unfortunately, the consequences of this lack of knowledge will affect patients.

The results of the study showed that the level of knowledge of general dentists participating in the study was average regarding odontogenic cysts, it was weak regarding odontogenic tumors, and overall, it was average. There was also no relationship between gender, work experience, and age and the level of knowledge.

Acknowledgment

We would like to express our gratitude to the Vice Chancellor for Research and Technology of Babol University of Medical Sciences for supporting the research, and all dentists who participated in the study.

References

1.Neville BW, Damm DD, Allen CM, Chi AC. Oral and maxillofacial pathology: Elsevier Health Sciences, 5th ed. Elsevier; 2023. p.685-737.
2.McLean AC, Vargas PA. Cystic Lesions of the Jaws: The Top 10 Differential Diagnoses to Ponder. Head Neck Pathol. 2023;17(1):85-98.
3.Summersgill KF. Pediatric Oral Pathology: Odontogenic Cysts. Pediatr Dev Pathol. 2023;26(6):609-20.
4.Varinauskas V, Gervickas A, Kavoliūniene O. Analysis of odontogenic cysts of the jaws. Medicina (Kaunas). 2006;42(3):201-7.
5.Niu G, Zhang G, Chen JM, Wang T, Wu Y, Lu YG, et al. A 3-year follow-up clinical study on the preservation for vitality of involved tooth in jaw cysts through an innovative method. Sci Rep. 2024;14(1):128.
6.Ghazi N, Saghravanian N, Mirhashemi M, Ardakani AA. Evaluation of Tenascin Expression in Ameloblastoma, Odontogenic Keratocyst, and Dentigerous Cyst by Immunohistochemistry. Adv Biomed Res. 2023;12:66.
7.Marelli S, Ghizzoni M, Pellegrini M, Scribante A, D'Ambrosio G, Sfondrini D. Lung Cancer Cells Infiltration into a Mandibular Follicular Cyst. Case Rep Dent. 2023;2023:7297821.
8.Magliocca KR. Proceedings of the 2023 North American Society of Head and Neck Pathology Companion Meeting, New Orleans, LA, March 12, 2023: Odontogenic Tumors: Have We Achieved an Evidence-Based Classification. Head Neck Pathol. 2023;17(2):313-24.
9.Agarwal S, Rao S, Lepcha J, Galhotra V. Large erupted complex odontoma mimicking maxillary osteomyelitis. BMJ Case Rep. 2023;16(1):e253322.
10.Anyanechi CE, Shetty SS. Ameloblastoma of the jaws in adult: A retrospective review of local recurrent lesions based on the resection margin in the adjacent apparent healthy tissues. Heliyon. 2023;9(5):e16243.
11.Reichart PA, Philipsen HP, Khongkhunthian P, Sciubba JJ. Immunoprofile of the adenomatoid odontogenic tumor. Oral Dis. 2017;23(6):731-6.
12.Kalbasi Gharavi N, Jahanshahi G, Dadellahi Sarab Y, Ahmadifard Z. The Evaluation of: General Dental practitioner Knowledge in Isfahan about Odontogenic cyst and tumor. J Res Dent Sci. 2020;17(3):229-35. [In Persian]
13.Nazar HS, Ariga J, Shyama M. Oral Cancer Knowledge, Attitudes, and Practices among Newly Graduated Dentists in Kuwait. Asian Pac J Cancer Prev. 2022;23(2):459-65.
14.Ojha B, Bajracharya D, Baral R. Knowledge of Oral Cancer among Online Respondent General Dentists: A Cross-sectional Survey. JNMA J Nepal Med Assoc. 2021;59(243):1120-4.
15.Akhondi S, Akhavan Karbasi MH, Barzegar M, Pouyafard A. Assessment of the Knowledge and Attitude and Practice of General Dentists in Yazd City about Oral Precancerous Lesion in 2018. J Shahid Sadoughi Univ Med Sci. 2021;29(6):3811-21. [In Persian]
16.Ala Aghbali A, Vosough Hossani S, Mahmoudifar F, Mahmoudi M, Janani M, Fattahi SH, et al. Evaluation of urmia dentists knowledge attitude practes about oral cancer in 2010. Nurs Midwife J. 2011;9(5):367-73. [In Persian]
17.Abdal K, Mortezaee K, Haidari S, Darvishi M. Evaluation of general dentists' knowledge about oral cancer in Ilam, Iran in 2016. J Bas Res Med Sci. 2019;6(1):36-40.