

Frequency and Distribution of Dental Anomalies in Iran: A Radiographic Survey

Maryam Tofangchiha, Somayyeh Azimi, Masoud Neirizi

ABSTRACT

Aim: Many epidemiological studies have been performed around the world in order to determine the frequency of different types of dental anomalies. There are regional and ethnic variations in the prevalence of dental anomalies.

To determine the prevalence of developmental and acquired dental anomalies in Iran, study was done from 2011 to 2012.

Materials and methods: A total of 1,000 digital panoramic radiographs of patient were evaluated which consisted of 424 (42/4%) male and 576 (57/6%) female. Data were analyzed by Chi-square and Fisher exact tests.

Results: Wisdom tooth impaction was the most prevalent anomaly (41.4% in females and 36% in males) followed by missing (8.7% male, 7/3% female), microdontia (3.2%), dilacerations (2.2%), macrodontia (1%), supernumerary teeth (0.8%), fusion and taurodontism (0.2%). A case of bilateral second mandibular molar impaction was observed. Germination, transposition and concrescence were not observed. Among the acquired anomalies, hypercementosis (0.6%) and internal resorption (0.4%) were the most prevalent respectively. External resorption was not observed.

Conclusion: Comparison of these results with those of other studies, showed that the frequency of these disorders were different in countries and communities around the world. Knowledge about these anomalies may facilitate the endodontic, prosthodontics, periodontics and surgical management of such teeth.

Keywords: Dental anomalies, Panoramic, Prevalence.

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INTRODUCTION

Dental anomalies may include variations in the number, size, morphology, or eruptive pattern of the teeth.¹ There are a wide range of these anomalies among different populations of the world. These anomalies may be congenital or acquired due to genetic or environmental factors.² Congenital abnormalities are typically genetically inherited anomalies and developmental anomalies occur during the formation of teeth. In contrast, acquired abnormalities result from changes to teeth after normal formation.¹ In other aspect, abnormalities of teeth may be part of systemic or syndromes disorders.²

Panoramic radiography is used for diagnostic goals such as third molar location, intraosseous lesions and developmental anomalies.³ It seems that digital radiography

is more accurate for these diagnostic approaches.⁴ This study was designed to determine the prevalence of developmental and acquired dental anomalies in Iran.

MATERIALS AND METHODS

In this descriptive-analytical survey, 1,000 radiographs of patients referring to one Oral and Maxillofacial Radiology Center in the city of Qazvin, Iran were randomly selected. Data were collected in 2011 to 2012. All the radiographs were taken by Soredex Cranex D digital panoramic system. The CDs containing panoramic radiographs were detached from the files and coded with numbers, then presented to two observers. The observers were intern students of dentistry who were trained for this reason. They were blinded to each other. The observers evaluated the radiographs and registered the data in separate forms. The cases which were considered having anomaly were re-evaluated by oral and maxillofacial radiologist who had at least 8 years history of working.

The data were analyzed using SPSS software. Chi-square and Fisher exact tests were used for analysis. A significance level of 0.05 was used.

RESULTS

The total number of 1,000 panoramic radiographs of the patients referring to oral and maxillofacial radiology from dental anomaly aspect was evaluated [424 (42.4%) male and 576 (57.6%) female]. These anomalies were included: Supernumerary teeth, missing teeth, anomalies related to tooth size, anomalies related to tooth eruption, developmental anomalies and acquired anomalies.

Comparative prevalence of dental anomalies considering sex is shown in Tables 1 to 7. Using Fisher exact test significance level for Table 1 is 0.429 which means there is no significant difference between sex and supernumerary teeth. It seems that prevalence of supernumerary teeth in male (0.94%) is more than female (0.69%). Using Chi-square test, the p-value for Table 2 is 0.067 which means that there is no significant difference between sex and missing teeth. The most prevalence tooth missing in male was mandibular premolar 2.6%. In female it was maxillary premolar and maxillary lateral incisor (2.7%). Totally the prevalence of missing teeth in male (8.7%) was more than females (7.3%).

Using Fisher exact test, the p-value for Table 3 is 0.719 which means there is no significant difference between sex

Table 1: Comparative prevalence of supernumerary teeth considering sex

Supernumerary tooth	Male		Female		Total	
	n	%	n	%	n	%
Distodens	2	0.47	4	0.69	6	0.6
Mesiodens	2	0.47	0	0	2	0.2
Total	4	0.94	4	0.69	8	0.8

p = 0.429

Table 2: Comparative prevalence of missing teeth considering sex

Missing tooth	Male		Female		Total	
	n	%	n	%	n	%
Maxillary premolar	13	3	16	2.7	29	2.9
Mandibular premolar	11	2.6	5	0.9	16	1.6
Canine	7	1.6	5	0.9	12	1.2
Lateral incisor	6	1.4	16	2.7	22	2.2
Total	37	8.7	42	7.3	79	7.9

p = 0.067

Table 3: Comparative prevalence of tooth size related anomalies considering sex

Tooth size	Male		Female		Total	
	n	%	n	%	n	%
Macrodontia	4	0.94	6	1	10	1
Microdontia	17	4	15	2.6	32	3.2
Total	21	4.9	21	3.6	42	4.2

p = 0.719

and tooth size-related anomalies. According to this table the prevalence of microdontia is more than macrodontia in both male and female.

Among the anomalies related to the tooth eruption only two cases of fusion was observed in females and the prevalence of other eruption-related anomalies were not observed (for Table 4 p-value cannot be calculated).

Using Chi-square test, the p-value for Table 5 is 0.336 which means there is no significant difference between sex and other developmental anomalies. The most prevalent anomaly was dilacerations in male 2.8%.

Using Fisher exact test, the p-value for Table 6 is 0.2 which means there is no significant difference between sex and acquired anomalies. The most prevalent anomaly was internal resorption (1%). Totally the prevalence of acquired anomalies in man 1.6% was more than female 0.52%.

Using Chi-square test, the p-value for Table 7 is 0.795 which means that there is no significant difference between sex and tooth impaction. The most prevalent anomaly was third molar impaction in female (41.4%) followed by third molar impaction in male (36%).

DISCUSSION

The data of the present study were collected from Iranians who attended in one oral and maxillofacial center.

Distribution the results of this study to vast population must be taken with caution. However, this data may be helpful to understand the general pattern of these anomalies and may impact on dental treatment provided in the community. In this study, we evaluate the prevalence rate of most commonly occurring dental abnormalities. Prevalence of these abnormalities is very low compared with dental caries and periodontal diseases, but they are more challenging for clinicians

Tooth impaction accounted for the highest prevalence at 41.7%. This figure was generally higher than those from other population groups. Afify reported⁵ a prevalence of 21.2% among Western Saudi Arabia. Anastasia reported⁶ a prevalence of 13.7% in Greece. Ghapanchi reported prevalence 4.34% in Shiraz, Iran. Ezoddini reported² a prevalence of 8.3% in Yazd, Iran.

Tooth missing accounted for 7.9% prevalence in this study. In other population groups the prevalence amount showed different figures. Afify reported⁵ a prevalence of 25.7% which was 2.5 times more than our study. Ghapanchi reported² a prevalence of 4.25% in Shiraz, Iran which was lower than our study. King reported⁷ a prevalence of 7.3% which was a bit lower than our study. Microdontia accounted for 3.2% prevalence in the present research. Ghapanchi's results² were different from those of ours (5.06%).

Table 4: Comparative prevalence of anomalies related to the tooth eruption considering sex

Tooth eruption	Male		Female		Total	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Fusion	0	0	2	0.34	2	0.2
Transposition	0	0	0	0	0	0
Concrescence	0	0	0	0	0	0
Total	0	0	2	0.34	2	0.2

Table 5: Comparative prevalence of other developmental anomalies considering sex

Developmental anomaly	Male		Female		Total	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Taurodontism	0	0	2	0.34	2	0.2
Dilaceration	12	2.8	10	1.7	22	2.2
Odontoma	2	0.47	2	0.34	4	0.4
Germination	0	0	0	0	0	0
Total	14	3.27	14	2.38	28	2.8

p = 0.336

Table 6: Comparative prevalence of acquired anomalies considering sex

Acquired anomaly	Male		Female		Total	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Internal resorption	4	0.94	0	0	4	0.4
External resorption	0	0	0	0	0	0
Hypercementosis	3	0.7	3	0.52	6	0.6
Total	7	1.6	3	0.52	10	1

p = 0.2

Table 7: Comparative prevalence of tooth impaction considering sex

Tooth impaction	Male		Female		Total	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Wisdom	153	36	239	41.4	392	39.2
Canine	9	2.1	12	2	21	2.1
Lateral incisor	0	0	3	0.52	3	0.3
2nd mandibular molar	1	0.23	0	0	1	0.1
Total	163	38.4	254	43.9	417	41.7

p = 0.795

Ezoddini's research⁸ resulted in a prevalence of 3.5% in the city of Yazd, Iran. Guttal reported⁹ a prevalence of 9.14% in the population of India which was higher than our study.

Dilacerations accounted for 2.2% prevalence in the present research. Afify reported⁵ a prevalence of 1.15 for such in anomaly in Saudi Arabia. Our figure is lower than that reported by Ezoddini (15%) in Yazd, Iran.⁸ Figure of 1.44% was reported by Ghapanchi² which was a bit higher than our study.

Macrodonia accounted for 1% prevalence in the present research. Guttal reported⁹ a prevalence of 0.28% in India. Ezoddini found⁸ that this anomaly accounted for 0.2% of prevalence among Yazd (Iran) patients and Atac reported¹⁰ the prevalence of 0.3% for this anomaly in Turkey.

Supernumerary teeth accounted for 0.8% prevalence in this study. It was lower than the figure of 2.4% reported by Ezoddini in Yazd, Iran⁸ and higher than Afify's results⁵ (0.3%) in Saudi Arabia. Guttal found⁹ that this anomaly accounted for 0.4% of all dental anomalies among Indian population.

A total of 1,751 Iranian orthodontic patients were examined by Vahid-Dastjerdi et al (2011)¹¹ and they found that 0.74% had supernumerary teeth. These investigators also reported¹² that nonsyndromic hypodontia in Iranian orthodontic patients were 197 congenitally missing teeth in 160 patients (9.1%; 74 boys and 86 girls).

Taurodontism was defined as the presence of an apically displaced pulp chamber without the usual constriction of cement enamel junction. In this study this anomaly

accounted for 0.2% of the prevalence. Afify reported⁵ a prevalence of 0.1% taurodontism in Arabian dental patients. Also Guttal reported¹³ a prevalence of 0.3% of this anomaly among Indian patients. Ghapanchi in Shiraz,² Iran found that taurodontism is more prevalent in patients (0.96%). Ezoddini's research reported⁸ a prevalence of 7.5% of taurodontism in Yazd, Iran which was about 39 times higher than our study. Our results show that taurodontism is uncommon in Qazvin but further studies are required to assess its prevalence in the general population.

Fusion accounted for 0.2% prevalence in this study which was equal to Ezoddini's research⁸ in Yazd, Iran. Guttal reported⁹ lower prevalence of 0.8% for Indian population. Atac reported¹⁰ a prevalence of 0.23% for such anomaly in Turkey.

Germination, transposition and concrescence were not found in our study. Guttal reported⁹ a prevalence of 0.28 and 0.02% for germination and concrescence respectively. In the Indian population in the study of king in China⁷ the prevalence of germination was also higher than ours (0.8%). Atac also reported¹⁰ a higher prevalence for germination in Turkey (0.07%).

Among the acquired dental anomalies, hypercementosis accounted for the highest prevalence at 0.6% which was lower than Kositbowornchai's study in Thai (1.2%).¹³

The prevalence of internal and external resorption was 0.4% and 0 respectively. No study was found to compare our results with.

According to investigations mentioned previously, abnormal variations occur in many cases are due to genetic, environmental and pathological factors and should be followed. Recognizing these anomalies will facilitate the dental treatment of patients with these anomalies.

CONCLUSION

The data from this survey and comparison with other studies showed that dental anomalies occur with different frequencies around the world. These anomalies are under genetic and environmental control, therefore contribute to regional differences. Although each of these anomalies has low prevalence in the dental clinics, their presence may create a management problem and complicate the treatment. Therefore, their diagnosis and management are important for general practitioner.

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ABOUT THE AUTHORS

Maryam Tofangchiha

Assistant Professor, Department of Oral and Maxillofacial Radiology Qazvin University of Medical Sciences, Qazvin, Iran

Somayyeh Azimi (Corresponding Author)

Assistant Professor, Department of Oral Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran, Phone: +982144221233 e-mail: somayyeh_azimi@yahoo.com

Masoud Neirizi

Dentist (General Practitioner), Department of Oral Medicine, Iran