

The prevalence and distribution of nonsyndromic hyperdontia in a group of Qatari orthodontic and pediatric patients

Najah Alhashimi¹, Feras H. Abed Al Jawad¹, Muneera Al Sheeb¹, Buthaina Al Emadi¹,
Jamal Al-Abdulla¹, Hanan Al Yafei¹

Correspondence: Dr. Feras H. Abed Al Jawad
Email: ferasjawad@gmail.com

¹Department of Dentistry, Hamad Medical Corporation, Doha, Qatar

ABSTRACT

Objective: There is no data specific to the Qatari population on the prevalence and distribution of hyperdontia. The aim of this study was to investigate the prevalence and distribution of hyperdontia in the permanent teeth among a group of Qatari sample and to compare the present results with findings from other populations. **Materials and Methods:** Records of 1269 Qatari patients (674 females; mean age 11.8 ± 2.3 and 595 males; mean age 11.4 ± 2.2 years) which included panoramic radiographs were examined to identify hyperdontia in the permanent dentition. Supernumerary teeth were assessed for their location, morphology, number, and whether impacted or not. **Results:** The prevalence of hyperdontia was 1.6% (females 0.7% and males 0.9%; $P < 0.169$). The most common type of supernumerary teeth was the supplemental (45.5%), followed by the conical (40%). Of the supplemental teeth, the mandibular incisor was the most prevalent (60%), followed by the premolar (20%). No significant difference in the prevalence was found between the maxilla and mandible. More than half of supernumerary teeth identified were impacted (54.5%). **Conclusions:** The prevalence of hyperdontia in a group of Qatari population was within the normal range of the majority of published studies in the literature. Although not significant, hyperdontia cases were more prevalent in male patients.

Key words: Hyperdontia, patient, prevalence, supernumerary teeth

INTRODUCTION

Dental anomalies that might affect the size, shape, or number of teeth are often detected during a routine clinical examination or incidentally. Early detection and diagnosis of such anomalies are essential for proper management and treatment to prevent future clinical problems and complications. A supernumerary tooth, or hyperdontia, is one of the dental anomalies that clinicians could face, and it is defined as teeth that exceed the normal dental formula, regardless of their location or morphology.^[1] Supernumerary teeth can be single or multiple, unilateral or bilateral, erupted

or impacted, everted, or taking abnormal eruptive direction.

In addition to occurring in isolated cases, hyperdontia can be associated with complex syndromes and developmental abnormalities such as Gardner syndrome, Fabry-Anderson syndrome, Ehler-Danlos syndrome, facial fissures, cleidocranial dysplasia or cleft lip and palate.^[2] In such syndromes, there could

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be one or more supernumerary teeth. Hyperdontia can occur in both primary and permanent dentitions although less frequently in the primary dentition.^[3]

The etiology of hyperdontia is poorly understood although several theories have been proposed such as dichotomy of tooth germs, hyperactivity of the dental lamina and Atavism.^[4,5] Genetic factors have been reported in the etiology as several studies supported the theory of familial tendency to supernumerary teeth with an increased numbers of supernumerary teeth evident in relatives of those affected.^[4,6]

The prevalence of hyperdontia has been reported in several studies with variations between different ethnic groups. According to Anthonappa *et al.*^[7] the majority of studies ranged from 1.2% to 3%. However, other reports found lower or higher than this range.^[8] These variations could be attributed to racial differences as well as differences related to methodologies adopted, diagnostic criteria, analyses employed, and sample sizes. In the State of Qatar, no study has investigated the prevalence and distribution pattern of hyperdontia. Therefore, the aim of this study was to investigate the prevalence and distribution of hyperdontia in the permanent dentition among a group of Qatari sample and to compare the present findings with other populations investigated in the literature.

MATERIALS AND METHODS

After obtaining ethical approval from the Medical Research Center at Hamad Medical Corporation, Doha - State of Qatar (Project number: 14077/14), records of 1269 Qatari patients who attended the Pediatric Dentistry and Orthodontic Clinics during the period (2009–2014) at the Department of Dentistry, Hamad Medical Corporation, Doha - State of Qatar were examined. Inclusion criteria were patients of Qatari origin, no history of medical problem or any type of syndromes and developmental anomalies, the presence of panoramic radiograph with good quality and patients who aged between 8 and 20 years.^[9]

Panoramic radiographs and clinical records were used to examine the presence of supernumerary teeth. Four experienced dentists who have at least 5 years of clinical experience examined all the radiographs over a period of 6 months. All radiographs were evaluated on viewers in a dark room.

Supernumerary teeth were assessed for their location, morphology, number, and whether impacted or not.

The morphology for every tooth was classified as supplemental, conical, tuberculate, and odontoma. Supplemental teeth were further categorized into those that resemble incisors, canines, premolars, and molars.

Data obtained were recorded according to age, gender, type of supernumerary teeth, maxillary versus mandibular and impacted versus not impacted.

Descriptive and comparative analyses were performed using the Statistical Package for the Social Sciences (version 20.0, SPSS Inc., Chicago, IL, USA). Student's *t*-test was employed to compare the chronological ages between male and female patients. To test the difference between male and female patients, maxillary versus mandibular, impacted versus nonimpacted, Chi-square or Fisher's exact tests were employed. To test data quality, 10% of the data were randomly selected and reevaluated by one of the investigators 2 weeks after the initial examination so that 100% reproducibility was assured in the identification of supernumerary teeth. The level of significance was set at 0.05.

RESULTS

The mean age of the patients was 11.6 ± 2.3 years. The study sample comprised of 674 (53%) female and 595 (47%) male patients [Table 1].

The prevalence of hyperdontia in the present study was 1.6%. There was no significant difference in the prevalence between genders although male patients demonstrated higher number of supernumerary teeth (60%). A total of 22 supernumerary teeth were identified in 20 patients. Two patients had two supernumerary teeth (10%) with the rest of patients having one supernumerary tooth (90%) [Table 2].

The supernumerary teeth identified in the present study composed of 10 supplemental teeth (45.5%), nine conical teeth (41%, seven mesiodens teeth, and two lateral conical teeth), two tuberculate teeth (9%), and one odontom (4.5%) [Table 3]. The most

Table 1: Descriptive data of patients included in the study

Gender	Number of patients	Age (SD)	P
Female	674	11.8 (2.3)	0.333*
Male	595	11.4 (2.2)	
Total	1269	11.6 (2.3)	

**P*<0.05, based on independent *t*-test. SD: Standard deviation

common supplemental tooth was the mandibular incisor (60%) followed by the premolar (20%). Only one supplemental maxillary lateral incisor (10%) and one supplemental maxillary permanent canine (10%) were found [Table 4].

Of the 22 supernumerary teeth, 12 teeth were impacted (54.5%) and 10 teeth were not impacted (45.5%). Twelve teeth were in the maxilla (54.5%) and 10 teeth in the mandible (45.5%). Only one patient had one supernumerary tooth in each jaw. There was no significant difference in the prevalence with respect to impacted versus nonimpacted or maxillary versus mandibular supernumerary teeth ($P < 0.280$; Table 5).

DISCUSSION

While hyperdontia is not a common dental anomaly, early diagnosis, and timely management are highly recommended to prevent future clinical complications.

Table 2: Distribution of hyperdontia by gender

Gender	Number of positive cases	Sum of supernumerary teeth	Prevalence (%)	P
Female	8	9	0.7	0.169*
Male	12	13	0.9	
Total	20	22	1.6	

*Based on Chi-square test

Table 3: Distribution of hyperdontia by type

Gender	Number	Prevalence (%)
Supplemental	10	45.5
Conical	9	41
Tuberculate	2	9
Odontom	1	4.5
Total	21	100

Table 4: Frequency of supplemental teeth

Gender	Number	Prevalence (%)
Mandibular incisor	6	60
Premolar	2	20
Maxillary lateral incisor	1	10
Maxillary canine	1	10
Total	10	100

Table 5: Distribution of hyperdontia by jaw and eruption status (impacted versus nonimpacted)*

Jaw	Number	Prevalence (%)	Eruption status	Number	Prevalence (%)
Maxilla	12	54.5	Impacted	12	54.5
Mandible	10	45.5	Nonimpacted	10	45.5
Total	22	100	Total	22	100

*P value was insignificant with respect to the two variables ($P < 0.280$)

Several studies reported on the prevalence of hyperdontia across different ethnic backgrounds, however, there is no data specific to the State of Qatar. Therefore, the aim of this study was to investigate the prevalence and distribution of hyperdontia in the permanent teeth among a group of Qatari sample and to compare the present data with others from the literature.

In the present study, the prevalence of hyperdontia was 1.6%. This finding was close to another study which was conducted in a Saudi sample which shares similar racial, environmental, and genetic characteristics.^[10] When compared to other Caucasian populations in the same region, this finding lies within the range of reported values (0.5–3%).^[11–13] Furthermore, the present finding is within the normal range of overall populations investigated in the literature.^[7,14] However, it was lower than several Asian populations previously investigated.^[3,15] Such variations between populations could be attributed to racial factors, sampling strategies, differences in sample sizes, the age of investigated cases, diagnostic tools, and recruiting patients from different setting whether clinical or from the general population.

Although not significant, higher number of hyperdontia cases was found in male patients (60%) when compared to female patients (40%). This finding was consistent with majority of studies which reported significant predominance in males.^[7,10,14,16] Only few reports found more cases in females.^[17] A possible explanation for not being statistically significant in males might relate to higher number of female patients in the present study when compared to male patients. Furthermore, esthetic concerns due to supernumerary teeth or other dental anomalies might lead to an overestimation in females as opposed to males because esthetics is of more importance to girls and their parents when compared to boys. As a result, more female patients are expected to visit their dentist seeking for intervention.

Morphologically, the most common supernumerary teeth found in the present study were the supplemental

teeth (45.5%) followed by conical teeth (40%). This finding contradicts the majority of studies which found that conical teeth were the most prevalent.^[8,11,16,18,19] This finding might be due to our sample makeup which included, in addition to patients seeking orthodontic treatment, patients from the pediatric clinic. Several studies recruited patients from orthodontic clinics only,^[19,20] and due to esthetic and clinical problems that conical teeth would cause, it is expected to have higher cases of conical teeth compared to other types of supernumerary teeth. Furthermore, racial and biological factors could also contribute to this finding. Contrary to majority of studies, the lower incisor was the most common supplemental supernumerary tooth (60%) followed by the lower supplemental premolar (20%). In the literature, the supplemental premolars and molars are reported to be the most prevalent morphological forms.^[10,16,21] This difference in the prevalence might be due to the age group of the present study which recruited younger patients compared to other studies. There are few reports which showed supernumerary premolars and molars developing at later stage during adulthood.^[22] Another explanation could relate to differences in the source of samples whether clinical or from the general public. Nazif *et al.*^[23] reported that supernumerary teeth of the molar group could be the most prevalent type in the general population. In this study, tuberculate teeth and odontomas were the least prevalent (13%). The fact that the majority of supernumerary teeth were of supplemental and conical types necessitates careful identification and monitoring of such teeth as they could pose serious complications to the developing permanent dentition. In most cases, it is recommended to remove them as early as possible to prevent future clinical complications.^[24]

In this study, there was no significant difference in the prevalence of supernumerary between the maxilla and the mandible. This finding contradicts the majority of studies in the literature which found that hyperdontia was more prevalent in the maxilla compared to the mandible.^[23,25] Few reports found more supernumerary teeth in the mandible.^[26,27] Only one patient had a supernumerary tooth in each jaw with no bilateral involvement within any jaw. The same finding was found by Amini *et al.*^[20]

More than half of supernumerary teeth (54.5%) identified were impacted which is concurrent with the majority of studies which reported that great deal of supernumerary teeth are impacted.^[21,28] This finding necessitates careful detection and diagnosis

of supernumerary as some cases might be unnoticed without the aid of radiographs. With respect to limitations of the present study, generalizability of the results could be questioned as investigating the prevalence from the general population would yield more reliable results. However, this will involve taking radiographs without any medical reason which is unethical. A further limitation might relate to the age of patients recruited in the present study (8–20 years). Several reports found that supernumerary teeth may develop at later stages of life during the third and fourth decades. For example, Cochrane *et al.*,^[22] reported on two adult patients in which late supernumerary molars and premolars erupted. This in turn, might have affected the overall results as younger adults were included with no older adult patients.

CONCLUSIONS

The prevalence of hyperdontia in a group of Qatari sample was within the normal range of reported values in the literature. Higher number of males was affected when compared to females. Morphologically, the most common type of supernumerary teeth was supplemental with accessory lower incisors being the most prevalent. There was no significant difference in the prevalence with respect to maxilla versus mandible. More than half of supernumerary teeth identified were impacted, and this finding necessitates careful detection, diagnosis, and monitoring of the developing dentition as supernumerary teeth might be unnoticed unless found incidentally.

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Conflicts of interest

There are no conflicts of interest.

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