

Clinical and Epidemiological Study of 106 Cases of Hyperdontia Southern Bulgaria

Research article

Radka Cholakova^{1*}, Dian Borchevaliev² and Delcho Zabanov²

¹Assistant professor, Department of Oral Surgery, Faculty of Dental medicine, Medical University – Plovdiv, Bulgaria

²Student in Faculty of Dental medicine, Medical University – Plovdiv, Bulgaria

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***Corresponding author:** Radka Cholakova, Department of oral surgery, Faculty of dental medicine, Medical University, “HristoBotev” 3, Plovdiv 4000, Bulgaria.

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Abstract

This article covers a clinical and epidemiological study, conducted by us, of 106 patients with clinically and radiologically diagnosed supernumerary teeth (ST). The objective of this study was to determine the frequency, morphology and location of hyperdontia by sex and age among the patients studied.

Material and methods: This is a case-control, observational, retrospective study of 106 patients with hyperdontia.

Results and conclusions: The male to female ratio in the studied patients was 2.21:1, with mean age of 16.84±1.15 years. In the mixed and primary dentition, the proportion of mesiodens was highest, while in the permanent dentition, the proportion of distomolar was highest. We diagnosed 65.47% (110 ST) in the maxilla, 14.29% (24 ST) in the mandible, and 20.24% (34 ST) affecting both jaws. Mesiodens and lateral incisor were more common in the maxilla, and parapremolar was more common in the mandible.

Keywords: hyperdontia, frequency by age and sex, mesiodens, parapremolar, paramolar, distomolar

Introduction

Supernumerary teeth (ST) are a rare dental anomaly compared to others, and they are diagnosed relatively late, as a consequence of the occurrence of complications in the maxillofacial region. Despite the numerous hypotheses which are intended to explain the occurrence of ST, their etiology remains unclear. It is generally accepted in the literature that heredity is the main reason for the development of hyperdontia. ST may be found by a routine, clinical or radiographic examination and they may not cause visible defects in adjacent teeth. Therefore, early diagnosis and appropriate intervention against ST may act as prevention of future complications.

The objective of this study is to conduct a clinical and epidemiological investigation of patients diagnosed with hyperdontia by clinical and radiological evidence.

Study design

This is a case-control, observational, retrospective study. A total of 106 patients diagnosed with hyperdontia by clinical and radiological examinations were analysed. The analysis took into account the following: sex and age of patients, clinical features, morphology, and location of ST. The study covers a 14-year period, from 2006 to 2019, and was conducted in patients of the Department of Oral

Surgery of the Faculty of Dental Medicine at the Medical University of Plovdiv.

Statistical data processing was performed using SPSS (for Windows). p-value < 0.05 was considered significance level. Charts were created by graphical analysis using Microsoft Excel 2016.

Results

106 patients with 168 ST diagnosed clinically and radiologically were examined. The mean age of the patients was 16.84±1.15 years, with the youngest patient being 3, and the oldest patient - 62. Of these, 68.9% were male, mean age 18.94±2.36, and 31.1% were female, mean age 15.89±1.28, respectively. The male to female ratio was 2.21:1. Demographic characteristics of patients diagnosed with hyperdontia are presented in Table 1.

Table 1: Distribution of patients with ST by age and sex.

Sex	Males		Females		Total	
	Number	%	Number	%	Number	%
Age group						
0 - 10 years	38	35.8	11	10.4	49	46.2
11 - 20 years	10	9.4	10	9.4	20	18.9
21 - 30 years	15	14.2	7	6.6	22	20.8
31 - 40 years	8	7.5	3	2.8	11	10.4
41 - 50 years	2	1.9	-	-	2	1.9
51 - 60 years	-	-	1	0.9	1	0.9
Over 61	-	-	1	0.9	1	0.9
Total	73	68.9	33	31.1	106	100

The distribution of ST by location and type of dentition is presented in Figure 1. In the mixed and primary

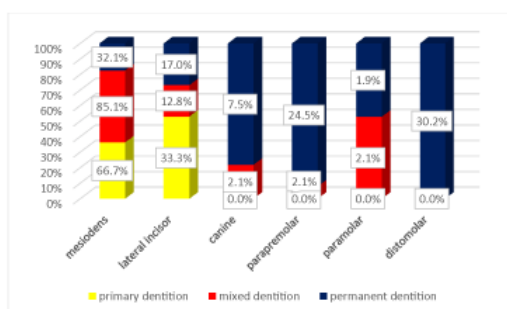


Figure 1: Distribution of the types of ST by dentition.

dentition, the proportion of mesiodens was highest, while in the permanent dentition, the proportion of mesiodens and distomolar was highest.

We diagnosed 65.47% (110 ST) in the maxilla, 14.29% (24 ST) in the mandible, and 20.24% (34 ST) affecting both jaws. Mesiodens and lateral incisor were more common in the maxilla, and parapremolar was more common in the mandible (Figure 2).

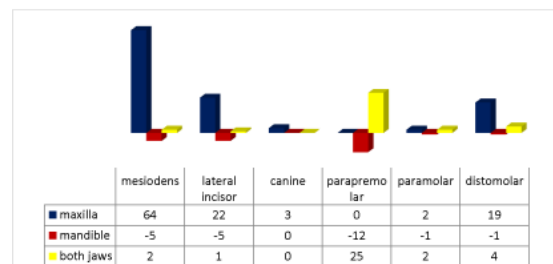


Figure 2: Distribution of ST by jaw..

No statistically significant difference was found in the distribution of by jaw (p-value > 0.05). In the maxilla, the proportion of mesiodens was highest, and in the mandible, the proportion of parapremolar was found to be highest.

The distribution by sex of the different types of ST is shown in Diagram 3. Females most frequently had mesiodens (39.48%), followed by lateral incisor (23.68%), while males most frequently had mesiodens (59.80%), followed by distomolar (13%) (Figure 3).

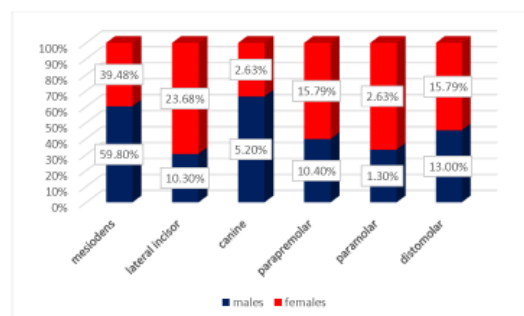


Figure 3: Distribution of ST by sex according to their morphotype.

The distribution of different morphotypes by the location of the ST is shown in Figure 4.

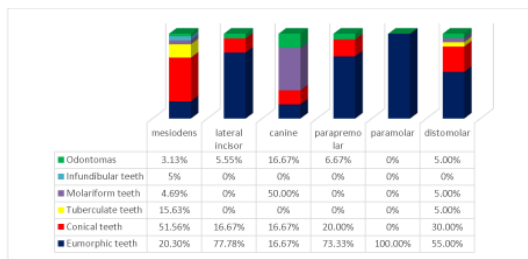


Figure 4: Morphotype of the types of ST.

The proportion of conical mesiodens was higher, and the lateral incisor, parapremolar, paramolar, distomolar were predominantly eumorphic.

Discussion

Of the 106 patients diagnosed with ST by clinical and radiological evidence, 73 were males and 33 were females, in a 2.21:1 ratio in favour of males. The male to female ratio of patients with hyperdontia ranges from 1.2:1 to 6.5:1 [1 - 8]. Salcido-Garcia JF et al. found a 1.2:1 ratio [9], Öztas B et al.- 1.4:1 [3], and other authors reported a 2:1 ratio [1,2,4,10,11]. Contrary to most authors, some authors reported higher proportion of supernumerary teeth in females [12,13]. In our study, mesiodens (59.8%) was predominant in males, the second most frequent was distomolar (13%), followed by parapremolar (10.4%). Females most frequently had mesiodens (39.48%), followed by lateral incisor (23.68%). According to Mallineni SK [14], subphenotypes of ST are differently distributed in both sexes - the midline and the premolar region are more commonly affected in males, while in females, the incisors and canines are more commonly affected.

We found mean age of 16.84 years of the patients affected by hyperdontia, which is similar to that found by Fernandez-Montenegro et al., Salcido-Garcia et al. and Ramesh [9,12,15]. This is significantly different from that reported by other authors [4,16 - 19], who found lower mean age, which correlates with the age of eruption of central incisors. Some researchers [3,13,20] report a higher mean age of patients with hyperdontia. This can be explained by the fact that all patients with ST were included in the study because of the late formation of distally located ST.

In the primary and mixed dentition, we found a greater proportion of ST in the frontal region of both jaws, while in the permanent dentition, distally located supernumerary

teeth were more common. This is due to the fact that mesiodens is formed and can lead to complications in early childhood, while distal teeth are diagnosed predominantly at a later age. ST are more common in the permanent (0.5-3.8%) than in the primary dentition [11,14,15,21-28]. In the permanent dentition, hyperdontia is twice as frequent as in the primary dentition [29], and according to other authors [23] its prevalence is 0.03-1.9% in the primary dentition. According to Esenlik et al. [30], the prevalence of ST in the primary dentition is 0.4%, and in the permanent dentition, it is 2.3%. The great difference in the frequency of ST between the two dentitions is probably due to the fact that hyperdontia in the primary dentition remains unnoticed by the parents as it does not cause other abnormalities [21,31]. In the primary dentition, a maxillary lateral incisor is most common, followed by maxillary and mandibular canines, unlike the permanent dentition [25].

Hyperdontia is more common in the maxilla according to most authors. We found 76.4% of the ST in the maxilla and only 18.9% in the mandible, in a 3.6:1 ratio, with 4.7% affecting both jaws. These values are very close to the findings of Celikoglu et al. [32], who found 68.8% in the maxilla and 31.2% in the mandible, respectively, and Öztas B et al. - 58.6% and 41.4%, respectively, in a 1.4:1 ratio. Other researchers [4,15,33] report values similar to those of Öztas B et al. De Oliveira Gomes et al. [18] and Liu et al. [2] reported 91.3% and 92% of the ST in the maxilla, respectively [34]. However, some authors [29,35] report prevalence of mandibular ST. The differences between the findings of different authors can be explained by the age of the patient included in the studies. At a younger age, mainly mesiodens is found, which is located mainly in the maxilla, and at a later age, parapremolar and distomolar, which are located predominantly in the mandible, are diagnosed. ST are most commonly found in the frontal region of the maxilla [29,36]. Most of them are located in the anterior region of the jaw [3]. We found 76.67% of cases of hyperdontia in the frontal segment of the maxilla, and 20% - in the frontal segment of the mandible, while in the distal part of the jaws, the proportions were 23.33% and 80%, respectively. Syriac et al. [19] reported that 93.3% of the cases were in the anterior region of the maxilla, 4.4% in the distal region of the mandible, and only 2.2% in the anterior region of the mandible. The greater proportion of ST in the frontal region found by Syriac et al. is probably related to the lower mean age (8.6 years) of the patients in their study and to the higher proportion of mesiodens at

that age. The preferential involvement of the premaxilla by hyperdontia is related to its complex formation by merging of several processes, the increased pressure which these processes exert on the permanent tooth germ and the errors in the course of development, as well as the higher proportion of injuries in this area, resulting in tooth germ dichotomy.

We found mesiodens (57.5%), lateral incisor (16%), distomolar (15.1%), premolar (13.2%), canine (4.7%), paramolar (1.9%) in decreasing frequency of distribution. Closest to our results are the results of Fernández-Montenegro et al. [15] - mesiodens (47-67%), distomolar (26%), premolar (8-9%), paramolar (15%), lateral incisor (2.05%), canine, (0.4%), and of Esenlik et al. [30] - mesiodens (51.2%), maxillary lateral incisor (15.5%), mandibular premolar (14.3%), maxillary canine (9.5%), maxillary premolar (6%), mandibular lateral incisor (2.4%) and mandibular canine (1.2%). According to Öztaş B et al. [3], parapremolars (43.1%) are the most common supernumerary teeth found in the Turkish population, followed by distomolars (31%), mesiodentes (19.8%), paramolars (2.6%), lateral incisors (2.6%) and canines (0.9%). In another study of the Turkish population conducted by Bereket et al. [37], the most common supernumerary teeth found were mesiodentes(30.45%), followed by distomolars (22.36%), parapremolars (20.18%), paramolars (13.18%), lateral incisors (8.9%), canines (4.36%), fifth distomolars (0.54%). Another study [4] found that the area in which ST are most common is the frontal part (89.6%), with a similar finding by Mahabob et al.[38] (85.7%); in the area of canine teeth and premolars, the presence of ST is 9%, and in the area of molars - 0.5% [38].The prevalence of ST in the jaws in a downward trend is as follows: mesiodentes> maxillary fourth molars > maxillary paramolars> mandibular premolars > maxillary lateral incisors > mandibular fourth molars > maxillary premolars [39,40]. Shapira and Kufinec [41] reported downward trend in frequency as follows: central incisors, molars, premolars, followed by lateral incisors and canines.

Conclusion

In the patients we studied, ST were found mainly in males, and were diagnosed at a young age. The greatest proportion of ST is found in the maxilla due to its more complex formation during embryonic development and the possibility of exposure to various environmental factors. The diagnosis is made mostly at a young age, up to

30 years. Mesiodens and distomolar are more commonly found in the maxilla, and parapremolar - in the mandible. Eumorphic teeth are most common, and infundibular teeth are least common. The most common is conical mesiodens.

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