

PREVALENCE OF POSITIONAL DENTAL ANOMALIES IN ADULT POPULATION OF BOSNIA AND HERZEGOVINA

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ABSTRACT

Positional dental anomalies (PA) are among frequent anomalies observed in dental practice. The aim of this study was to screen and identify the presence of positional dental anomalies within adult population in Bosnia and Herzegovina.

Material and methods: The sample comprised of 492 adult subjects, aging from 20 to 44 years, both sexes, subdivided into age groups. A comprehensive standard clinical examinations were performed, using defined criteria.

Results: Among all examined persons the positional anomalies (PA) were found in 263 patients (53,3%). The prevalence of PA was the highest in adults aged 25-34 (57,5%). There was a significant difference in prevalence of positional anomalies among different age groups (Chi square 13,342, $p < 0,001$). There were differences in prevalence of PA between persons of different sex, but no significant difference was found in PA prevalence between different sexes within the same age group. In overall adult sample the rotation was the most frequent positional anomaly and was found in 42, 7% cases. Ectopic teeth was found in 19, 3%, with a significant difference in prevalence of ectopic tooth in males (Chi square 6,281, $p = 0,043$). Transposition had prevalence of only 0, 4%, proving to be a rare phenomenon.

Conclusion: Positional anomalies are very often registered and corrected through orthodontic treatment during children's growth, but they should also be observed and noted among adults. For those adults, adequate orthodontic procedures should be advised and advocated.

Key words: dental anomalies, rotation, ectopic teeth, transposition, prevalence.

Introduction

Dental anomalies are abnormalities of number, size, shape (form), position and function of teeth [1]. The causes of dental anomalies are various from genetic mutations to environmental, traumatic and nutritional. Clinical problems caused by dental anomalies are both aesthetic and functional. Prevalence of dental anomalies are subject of many studies worldwide [2, 3, 4] but there are no many such studies in Bosnia and Herzegovina. Usually, dental anomalies' prevalence is examined within children population [5, 6, 7] but rarely among adults. Positional dental anomalies are considered as the most frequent anomalies observed in dental practice. Regardless to aetiology, positional anomalies in adults can increase the risk of caries and periodontal diseases, and/or disturb dental harmony ultimately leading to poor aesthetic appearance [8]. Orthodontic treatment of positional anomalies in adults is an option and should be considered, even if not associated with other dental anomalies and/or malocclusions.

Some previous studies have investigated different dental anomalies in different populations and among persons of different age range.[9, 10, 11]

The aim of this study was to screen and identify the presence of positional dental anomalies within adult population in Bosnia and Herzegovina. Increasing knowledge on these anomalies among adult population can help understanding the disturbances in eruption pattern and contribute to treatment planning. The study protocol was approved by the Ethics Committee of the Faculty of Dentistry with Clinics, University of Sarajevo.

Material and Methods

Study was cross-sectional, epidemiological and conducted from March to December 2017. The sample comprised of 492 adult subjects, aging from 20 to 44 years, both sexes, after being given the informed consent (**Table 1**). Only persons with all teeth present (third molars excluded) and without previous orthodontic treatment were included. Adults were subdivided into age groups (**Table 2**). A comprehensive standard clinical examinations were performed in clinics of Faculty of Dentistry, University of Sarajevo.

Age	Sex	Number
20-24	Male	35
	Female	34
25-34	Male	99
	Female	143
35-44	Male	52
	Female	129

Table 1. Age and sex distribution of the sample

Age	Number	Minimum	Maximum	Mean	Std. Deviation
20-24	69	20	24	22.54	1.24
25-34	242	25	34	30.56	3.01
35-44	181	35	44	38.81	2.17

Table 2. Descriptive statistics (minimum, maximum, mean and standard deviation) of subjects' age

	Frequency	Prevalence ^a (%)
Positional anomaly	263	53.5
No anomaly	229	46.5
Total	492	100.0

^aPrevalence = Number of anomalies/Total population (492)

Table 3. Prevalence and frequency of positional anomalies

Age	Positional anomalies	Frequency	Prevalence (%)
20-24	Yes	23	33.3
	No	46	66.7
	Total	69	100.0
25-34	Yes	140	57.9
	No	102	42.1
	Total	242	100.0
35-44	Yes	100	55.2
	No	81	44.8
	Total	181	100.0

Table 4. Frequency and prevalence of positional anomalies (PA) in adults of different age

Criteria for diagnosing positional anomalies: No anomaly-normal, correct position of the tooth in the dental arch; Rotation-completely erupted tooth rotated around the longitudinal axis toward mesial or distal side irrespective to the degree of rotation; Ectopia - a completely erupted tooth that is distant from the place of its normal expected position (emergence); Transposition - the appearance of two totally erupted teeth that completely replaced positions; Other anomalies of the position of the tooth - will be recorded in the case, for example subimpaction and infraocclusion, as other deviations of the individual tooth from the normal position in the dental arch.

Statistical analysis was performed using Windows SPSS v.15 and Chi-square test was conducted to determine the statistical significance of dental anomalies by age groups and sex. *P* values ≤ 0.05 were considered significant.

Results

Among all examined persons the positional anomalies (PA) were found in 263 patients (53, 3%) (Table 3). The prevalence of PA was the highest in adults aged 25-34 (57, 5%), and lowest in adults aged 20-24. (Table 4) There was a significant difference in prevalence of positional anomalies among different age groups (Chi square 13,342, *p*<0,001). In adults aged 20-24 there are significantly less positional anomalies compared to other age groups.

There were differences in prevalence of PA between persons of different sex within same age range. (Table 5), but no significant difference was found in PA prevalence between different sexes within the same age group (Age group 20-24: Chi square 1,855, *p*>0, 05; Age group 25-34: Chi square 0,362, *p*> 0, 05; Age group 35-44: Chi square 2,441, *p*>0,05).

In overall adult sample the rotation was found in 42, 7% cases. The highest prevalence (48, 8%) of rotation was found in adult females aged 35-44 (Table 6), but no significant differences was found in tooth rotation prevalence between persons of different sex within the same age range (Males: Chi square 5,773, *p*>0, 05; Females: Chi square 1,998 *p*>0,05)

At least one ectopic tooth was found in 19, 3% of all cases. The prevalence of ectopic tooth was 17, 2%

Age	Sex	Positional anomalies		Total	
		Yes	No		
20-24	Male	Count	9	26	35
		% within sex	25.7%	74.3%	100.0%
	Female	Count	14	20	34
		% within sex	41.2%	58.8%	100.0%
	Total	Count	23	46	69
		% within	33.3%	66.7%	100.0%
25-34	Male	Count	55	44	99
		% within sex	55.6%	44.4%	100.0%
	Female	Count	85	58	143
		% within sex	59.4%	40.6%	100.0%
	Total	Count	140	102	242
		% within	57.9%	42.1%	100.0%
35-44	Male	Count	24	28	52
		% within sex	46.2%	53.8%	100.0%
	Female	Count	76	53	129
		% within sex	58.9%	41.1%	100.0%
	Total	Count	100	81	181
		% within	55.2%	44.8%	100.0%

Table 5. Frequency and prevalence of PA in persons of different sex and age

Sex	Age	Rotation		Total		
		Yes	No			
Male	20-24	Count	7	28	35	
		% within age range	20.0%	80.0%	100.0%	
	25-34	Count	42	57	99	
		% within age range	42.4%	57.6%	100.0%	
	35-44	Count	21	31	52	
		% within age range	40.4%	59.6%	100.0%	
	Total	Count	70	116	186	
		%	37.6%	62.4%	100.0%	
	Female	20-24	Count	12	22	34
			% within age range	35.3%	64.7%	100.0%
		25-34	Count	65	78	143
			% within age range	45.5%	54.5%	100.0%
35-44		Count	63	66	129	
		% within age range	48.8%	51.2%	100.0%	
Total		Count	140	166	306	
		%	45.8%	54.2%	100.0%	

Table 6. Prevalence of tooth rotation among different sexes and different age groups

in adult males and 20, 5% in adult females (**Table 7**). There was a significant difference in prevalence of ectopic tooth in males (Chi square 6,281, $p=0,043$). In adult males aged 20-24 there were significantly less ectopic teeth compared to the males older than 25.

Prevalence of teeth transposition (TT) was only 0, 4%. In overall sample only two cases of transposition were found, both in females older than 25. Other positional anomalies (OPA) were found in only one case, resulting in prevalence of 0, 2%

Discussion

The present study focused on positional anomalies among adults in Bosnia and Herzegovina. Few years ago, similar study was conducted in Bosnia and Herzegovina focusing on dental anomalies among dental students aged 18-24.[9]. Some other studies worldwide focused on children and adolescents [2, 3, 6, 7, 12, 13], orthodontic patients [13] and other populations [8, 10, 14, 15, 16, 17, 18, 19, 20, 21, 22] but no recent study was focused on adults of Bosnia and Herzegovina.

Research of positional anomalies prevalence is interesting from anthropological point, because population differences have been recognized, and trends in tooth position change can be followed and understood. Prevalence of positional anomalies in adults of Bosnia and Herzegovina is 53, 3% with no differences between sexes. In Turkish population prevalence of PA was 60, 8% [19], in Iraqi population only 24% [10], and in Indian was also the most common dental anomaly [17, 21]. The differences can be explained by different selection of anomalies, that is very often third molar impaction included, or by population and/or genetic impact differences. Rotation was the most common positional anomaly (42,3%) in adults of Bosnia and Herzegovina, which is much higher than in population of Saudi Arabia where rotation was found in 20,2% [14], or in Indian population where rotation was found in 10,24%[15]. Ectopic eruption of tooth was the second most common positional anomaly with prevalence of 19,3% in overall adult population in Bosnia and Herzegovina, while its prevalence among adults in India was only 7,93% 15, and in Saudi Arabia 7,6% [14]. In Turkish population, ectopic teeth were found in 1, 52% of orthodontic patients [13]. Among adults observed in our study ectopic teeth were often

Sex	Age	Ectopic tooth		Total		
		Yes	No			
Male	20-24	Count	2	33	35	
		% within age range	5.7%	94.3%	100.0%	
	25-34	Count	23	76	99	
		% within age range	23.2%	76.8%	100.0%	
	35-44	Count	7	45	52	
		% within age range	13.5%	86.5%	100.0%	
	Total	Count	32	154	186	
		%	17.2%	82.8%	100.0%	
	Female	20-24	Count	4	30	34
			% within age range	11.8%	88.2%	100.0%
25-34		Count	32	111	143	
		% within age range	22.4%	77.6%	100.0%	
35-44		Count	27	102	129	
		% within age range	20.9%	79.1%	100.0%	
Total		Count	63	243	306	
		%	20.6%	79.4%	100.0%	

Table 7. Ectopic teeth in subjects of different sex within age groups

associated with tooth rotation. Transposition of teeth in our study were found in only two cases (0,4%) which is in accordance with findings of transposition among dental patients in Iran 0,1% [22] or 0,3% in Saudi Arabia [14], confirming the findings of previous studies [14,23,24], but different from population in Mexico where transposition was found in 2,38% [16]. These findings suggest that tooth transposition may be considered as rare phenomenon that affects various populations.

In the present study, the third molars were excluded because of their variability in number, size, shape and position. If positional anomalies of third molars were included than overall prevalence of positional anomalies would be even higher. The incidence of impacted third molars in population of Bosnia and Herzegovina is very high (61, 2% among persons aged 20-30) 25 and the complete diagnostic protocol requires radiographic evaluation. Our study was entirely clinical not involving radiographic procedures.

Conclusion

Overall prevalence of positional anomalies in adult population in Bosnia and Herzegovina is 53, 5%. The prevalence of positional anomalies in different age groups was 33, 3%, 57.9%, 55, 2% respectively, showing the significantly less positional anomalies in adults aged 20-24 when compared to other age groups. There was no significant difference in prevalence of positional anomalies between adult males and females within the same age groups. Rotation was the most frequent positional anomaly with prevalence of 42, 7%, but with no significant difference in the prevalence of this anomaly regarding the different age group or sex. The prevalence of ectopic teeth was 19, 3%. In adult males, the prevalence of ectopic teeth was 17, 2%, and in females was 20, 6%. The younger adult males (younger than 25) had significantly less ectopic teeth than adult males in other age groups (25-34 and 35-44). Transposition was found in only two cases (prevalence of 0, 4%), both cases were females.

Positional anomalies are very often registered and corrected through orthodontic treatment during children's growth, but they should also be observed and noted among adults. For those adults, adequate orthodontic procedures should be advised and advocated.

Conflict of interest: The authors declare that they have no conflict of interest. This study was not sponsored by any external organisation.

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