

VELIČINA STALNIH FRONTALNIH ZUBA KOD MALOKLUZIJA III KLASE

SIZE OF PERMANENT FRONTAL TEETH WITH MALOCCLUSION OF III CLASS

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Kratak sadržaj

Veličina zuba je jedan od važnih faktora koji utiče na formiranje okluzije.

Cilj rada bio je da se ispita veličina stalnih frontalnih zuba, meziodistalni i vestibulolingvalni promer i njihov odnos predstavljen indeksom zuba po formuli $MD-VL \times 100$ kod osoba sa normalnom okluzijom i malokluzijom III klase.

Ispitano je 90 osoba od kojih 50 sa normalnom okluzijom (20 muških i 30 ženskih osoba) i 40 sa malokluzijom III klase po Anglu (20 muških i 20 ženskih). Merenje je izvršeno nonijusom sa tačnošću od 0,01mm. Razlike između grupa su testirane *t* testom.

Osobe muškog pola sa normalnom okluzijom imaju veći meziodistalni i vestibulolingvalni promer frontalnih zuba u obe vilice sa postojanjem statističke značajnosti kod pojedinih zuba. Kod osoba sa malokluzijom III klase meziodistalni i vestibulolingvalni promer gornjih i donjih frontalnih zuba su takođe veći kod osoba muškog pola sa postojanjem statističke značajnosti kod gornjeg i donjeg očnjaka. Indeks krune gornjih i donjih zuba ne pokazuje značajne razlike među polovima kako kod normalne okluzije tako i kod malokluzija III klase. Komparacija ispitivanih parametara između ispitivanih grupa po polovima pokazuje postojanje polnog dimorfizma. Ove činjenice se moraju uzeti u obzir pri planiranju terapije.

Ključne reči: veličina zuba, malokluzija III klase, normalna okluzija

Abstract

Size of teeth is one of major factors which effects forming occlusion.

The objective of the paperwork has been to investigate size of permanent frontal teeth, mesiodistal and vestibulolingual diameter and their relationship represented by index of teeth as per formula $MD-VL \times 100$ with persons with normal occlusion and malocclusion of III class.

There were examined 90 persons out of whom 50 with normal occlusion (20 of males and 30 of females) and 40 with malocclusion of III class Angle (20 males and 20 females). Measurement was effected by nonius with accuracy of 0.01mm. Differences between groups are tested by *t* test.

Persons of male sex with normal occlusion have bigger mesiodistal and vestibulolingual diameter of frontal teeth in both jaws with existence of statistical significance with certain teeth. With persons with malocclusion of III class the mesiodistal and vestibulolingual diameter of upper and lower frontal teeth are also bigger with persons of male sex with existence of statistical significance with upper and lower bicuspids. Index of crown of upper and lower teeth does not show significant differences between the sexes both with normal occlusion and with malocclusion of III class. Comparison of examined parameters between examined groups according to sexes shows existence of gender dimorphism. These facts must be taken into consideration when planning the therapy.

Key words: size of teeth, malocclusion of III class, normal occlusion

Uvod

Veličina zuba kao jedan od bitnih faktora koji utiče na formiranje okluzije razlikuje se kod različitih osoba, rasa, naroda i etničkih grupa.¹⁻⁵

Introduction

Size of teeth as one of major factors that effects forming occlusion differs with various persons, races, peoples and ethnic groups.¹⁻⁵

Veličina zuba je genetski određena⁶⁻⁸ mada postoje i drugačije teorije koje govore o uticaju spoljašnjih lokalnih etioloških faktora okoline kao važnih činioca.^{9,10} Odvojeno se nasleđuje veličina mlečnih i stalnih zuba tako da se ne može na osnovu veličine mlečnih proceniti veličina stalnih zuba.

Osobe muškog pola imaju veće zube nego osobe ženskog pola.¹¹⁻¹⁷

Veličina zuba je različita kod pripadnika pojedinih rasa. Utvrđeno je da osobe crne rase imaju veće zube nego osobe bele rase^{1,2,4,5} dok je kod osoba žute rase veličina zuba nešto manja u odnosu na pripadnike bele rase.¹⁶

Podeljena su mišljenja o veličini zuba kod različitih ortodontskih anomalija. Ispitivanja pojedinih autora pokazuju da su mandibularni zubi veći kod osoba sa malokluzijom III klase,^{11,19,20,21} a maksilarni kod osoba sa malokluzijom II klase,^{19,22,23} dok drugi autori ne nalaze značajne razlike u veličini zuba u zavisnosti od prisutne ortodontske anomalije.^{24,25}

Cilj rada

Cilj ovog rada bio je da se ispita veličina stalnih gornjih i donjih frontalnih zuba, meziodistalni i vestibulolingvalni promer zuba i njihov odnos predstavljen indeksom zuba po formuli $MD/VL \times 100$ kod osoba sa normalnom okluzijom i malokluzijom III klase.

Materijal i metod

Ispitivanje je obavljeno na Klinici za stomatologiju u Nišu, odeljenje za ortopediju vilica, na studijskim modelima 90 osoba sa stalnom denticijom od kojih je 50 sa normalnom okluzijom (20 muških i 30 ženskih osoba) i 40 sa malokluzijom III klase po Angleu (20 muških i 20 ženskih). Svim pacijentima uzeti su precizni otisci na bazi kojih su dobijeni studijski modeli na kojima su izvršena sledeća merenja:

Meziodistalni promer stalnih frontalnih zuba meren je pomoću digitalnog nonijusa sa preciznošću od 0,01mm. Tanki kraci mernog instrumenta postavljani su paralelno sa uzdužnom osom zuba u predelu kontaktnih tačaka.

Size of teeth is genetically determined⁶⁻⁸ although there are also different theories which tell about the influence of external local etiological factors of environment as important factors^{9,10}. The size of milk and permanent teeth is inherited separately so that the size of permanent teeth cannot be estimated on the basis of the size of milk teeth.

Persons of male sex have larger teeth than persons of female sex¹¹⁻¹⁷. The size of teeth is different with members of certain races. It is determined that persons of black race have larger teeth than persons of white race^{1,2,4,5} while with persons of yellow race the size of teeth is slightly smaller in relation with members of white race.¹⁶

The opinions are split about the size of teeth with various orthodontic anomalies. Examinations of certain authors show that mandibular teeth are larger with persons with malocclusion of III class^{11,19,20,21} and maxillary ones with persons with malocclusion of II class^{19,22,23} while other authors do not find significant differences in the size of teeth depending on the present orthodontic anomaly.^{24,25}

Objective of paperwork

The objective of this paperwork has been to investigate the size of permanent upper and lower frontal teeth, mesiodistal and vestibulolingual diameter of teeth and their relationship represented by index of teeth to formula $MD/VL \times 100$ with persons with normal occlusion and malocclusion of III class.

Material and method

Investigation was performed at Clinic of Stomatology in Nis, department for orthopedy of jaws, on study models of 90 persons with permanent dentition out of whom 50 with normal occlusion (20 males and 30 females) and 40 with malocclusion of III class as per Angle (20 males and 20 females). Accurate impresses were taken from all patients and on this basis there were obtained study models which served for performance of the following measurements:

Mesiodistal diameter of permanent frontal teeth was measured by means of digital nonius with accuracy of 0.01mm. Thin forks of the measuring instrument were placed parallel to longitudinal axis of teeth in the region of contact points.

Vestibulolingvalni promer stalnih frontalnih zuba meren je takođe pomoću nonijusa postavljanjem kraka instrumenta paralelno uzdužnoj osovini u najširem obimu zuba. Greška merenja određena je ponovljenim merenjem deset modela odabranih metodom slučajnog uzorka i merenih deset dana posle prvog merenja.

Nisu nađene značajne razlike promera zuba leve i desne strane tako da to nije uzeto u obzir tokom analize.

Index krune zuba izračunat je za sve frontalne zube gornje i donje vilice pomoću formule MD/VL x 100.

Dobijeni rezultati su obrađeni kompjuterski primenom osnovnih statističkih parametara: prosečna vrednost (X), standardna devijacija (SD) i raspon minimalnih i maksimalnih vrednosti. Razlike između polova i između ispitivanih grupa (teskobe i normalne okluzije) testirane su t- testom.

Rezultati

Normalna okluzija

Meziodistalni promer gornjih sekutića (tab. 1) Prosečna vrednost meziodistalnog promera gornjih centralnih sekutića kod osoba muškog pola iznosi 8,42mm a kod osoba ženskog pola 8,38mm. Postoji značajna polna razlika u korist osoba muškog pola (t-test 2,43, p<0,05). Prosečna vrednost meziodistalnog promera gornjih lateralnih sekutića kod osoba muškog pola iznosi 6,76mm a kod osoba ženskog pola 6,61mm. Postojeća razlika nije statistički značajna.

Vestibulolingual diamter of permanent frontal teeth was also measured by means of nonius by placing the fork of the instrument parallel to longitudinal axis in the widest circumference of the teeth. The measurement error was determined by repeated measurement of ten models chosen by method of random choice and measured ten days after the first measurement.

There were not found significant differences of the diameter of the teeth of the left and the right side so that it was not taken into consideration during the anlysis.

The index of the crown of the teeth was calculated for all frontal teeth of upper and lower jaws via formula MD/VL x 100.

The obtained results were processed by computer by application of basic statistical parameters: the mean value (X), standard deviation (SD) and the span of minimal and maximal values. Differences between sexes and between examined groups (crowdings and normal occlusions) were tested by t-test.

Results

Normal occlusion

Mesiodistal diameter of upper incisors (table 1). The mean value of mesiodistal diameter of upper central incisors with persons of male sex amounts to 8.42mm and with persons of female sex 8.38mm. There is significant gender difference in favour of persons of male sex (t-test 2.43, p<0.05). The mean value of mesiodistal diameter of upper lateral incisors with persons of male sex amounts to 6.7mm and with persons of female sex 6.61mm. The existing difference is not statistically significant.

Tabela 1. Razlike meziodistalnog i vestibulolingvalnog promera i indeksa krune stalnih gornjih frontalnih zuba kod osoba sa normalnom okluzijom

Table 1. Differences in mesiodistal and vestibule lingual size and index of crown of upper frontal permanent teeth for persons with normal occlusion

Tooth	Sex	MD				VL				IC			
		n	X	SD	t-test	n	X	SD	t-test	n	X	SD	t-test
J1	m	20	8.42	0.58	2.43	20	7.59	0.30	6.19****	20	115.0	7.15	2.18*
	f	30	8.38	0.40		30	7.04	0.31		30	119.2	6.37	
J2	m	20	6.76	0.32	1.23	20	6.77	0.51	3.50****	20	100.2	6.01	2.26*
	f	30	6.61	0.48		30	6.31	0.41		30	104.9	7.99	
C	m	20	7.93	0.32	4.66****	20	8.41	0.38	5.89****	20	94.4	3.35	1.40
	f	30	7.53	0.28		30	7.83	0.31		30	96.3	5.52	

Meziodistalni promer donjih sekutića (tabela 2). Prosečna vrednost meziodistalnog promera donjih centralnih sekutića kod osoba muškog pola iznosi 5,30mm a kod osoba ženskog pola 5,14mm. Postoji značajna polna razlika (t-test 2,43, $p < 0,05$) Prosečna vrednost meziodistalnog promera donjih lateralnih sekutića kod osoba muškog pola iznosi 6,03mm a kod osoba ženskog pola 5,71mm. Postojeća razlika je statistički značajna (t-test 4,01, $p < 0,001$).

Mesiodistal diameter of lower incisors (table 2). The mean value of mesiodistal diameter of lower central incisors with persons of male sex amounts to 5.30mm and with persons of female sex 5.14mm. There is significant gender difference (t-test 2.43, $p < 0.05$). The mean value of mesiodistal diameter of lower lateral incisors with persons of male sex amounts to 6.03mm and with persons of female sex 5.71mm. The existing difference is statistically significant (t-test 4.01, $p < 0.001$).

Tabela 2. Razlike meziodistalnog i vestibulolingvalnog promera i indeksa krune stalnih donjih frontalnih zuba kod osoba sa normalnom okluzijom

Table 2. Differences in mesiodistal and vestibule lingual size and index of crown of lower frontal permanent teeth for persons with normal occlusion

Tooth	Sex	MD				VL				IC			
		n	X	SD	t-test	n	X	SD	t-test	n	X	SD	t-test
I 1	m	20	5.30	0.26	2.43*	20	6.43	0.44	4.64***	20	82.7	6.21	2.78***
	f	30	5.14	0.22		30	5.93	0.33		30	86.8	4.10	
I 2	m	20	6.03	0.30	4.01***	20	6.56	0.29	2.07*	20	92.1	5.02	0.77
	f	30	5.71	0.26		30	6.31	0.46		30	90.8	6.48	
c	m	20	6.92	0.36	3.55***	20	7.97	0.48	4.32***	20	87.0	5.53	1.55
	f	30	6.58	0.31		30	7.38	0.47		30	89.4	5.06	

Vestibulolingvalni promer gornjih sekutića (tabela 1). Prosečna vrednost vestibulolingvalnog promera gornjih centralnih sekutića kod osoba muškog pola iznosi 7,59mm a kod osoba ženskog pola 7,04mm. Postoji visoko značajna polna razlika (t-test 6,19, $p < 0,001$). Prosečna vrednost vestibulolingvalnog promera gornjih lateralnih sekutića kod osoba muškog pola iznosi 6,77mm a kod osoba ženskog pola 6,31mm. Postoji značajna polna razlika (t-test 3,50, $p < 0,01$).

Vestibulolingvalni promer donjih sekutića (tabela 2). Prosečna vrednost vestibulolingvalnog promera donjih centralnih sekutića kod osoba muškog pola iznosi 6,43mm a kod osoba ženskog pola 5,20mm. Postoji visoko značajna razlika (t-test 4,64, $p < 0,001$). Prosečna vrednost donjih lateralnih inciziva kod osoba muškog pola iznosi 6,56mm a kod osoba ženskog pola 6,32mm. Postoje polne razlike (t-test 2,07, $p < 0,05$).

Indeks krune gornjih sekutića (tabela 1). Prosečna vrednost indeksa krune gornjih

Vestibulolingual diameter of upper incisors (table 1). The mean value of vestibulolingual diameter of upper central incisors with persons of male sex amounts to 7.59mm and with persons of female sex 7.04mm. There is highly significant gender difference (t-test 6.19, $p < 0.001$). The mean value of vestibulolingual diameter of upper lateral incisors with persons of male sex amounts to 6.77mm and with persons of female sex 6.31mm. There is significant gender difference (t-test 3.50, $p < 0.01$).

Vestibulolingual diameter of lower incisors (table 2). The mean value of vestibulolingual diameter of lower central incisors with persons of male sex amounts to 6.43mm and with persons of female sex 5.20mm. There is highly significant difference (t-test 4.64, $p < 0.001$). The mean value of lower lateral incisors with persons of male sex amounts to 6.56mm and with persons of female sex 6.32mm. There are gender differences (t-test 2.07, $p < 0.05$).

Index of crown of upper incisors (table 1). The mean value of index of crown of upper central incisors with persons of male sex amounts

centralnih sekutića kod osoba muškog pola iznosi 115,03 a kod osoba ženskog pola 119,24. Postoji značajna razlika u korist osoba ženskog pola (t- test 2,18) na nivou značajnosti $p < 0,05$. Prosečna vrednost indeksa krune gornjih lateralnih sekutića kod osoba muškog pola iznosi 100,21 a kod osoba ženskog pola 104,95. Postoji polna razlika (t-test 2,26, $p < 0,05$) u korist osoba ženskog pola.

Indeks krune donjih sekutića (tabela 2). Prosečna vrednost indeksa krune donjih centralnih sekutića kod osoba muškog pola iznosi 82,76 a kod osoba ženskog pola 86,82. Postoji značajna razlika u korist osoba ženskog pola (t-test 2,78) na nivou značajnosti $p < 0,05$. Prosečna vrednost indeksa krune donjih lateralnih sekutića kod osoba muškog pola iznosi 92,10 a kod osoba ženskog pola 90,78. Nije prisutan polni dimorfizam.

Malokluzija III klase

Meziodistalni promer gornjih sekutića (tabela 3). Prosečna vrednost meziodistalnog promera gornjih centralnih sekutića kod osoba muškog pola iznosi 8,45mm a kod osoba ženskog pola 8,34 mm. Nema značajnih polnih razlika (t-test 0.57). Prosečna vrednost meziodistalnog promera gornjih lateralnih sekutića kod osoba muškog pola iznosi 6,74mm a kod osoba ženskog pola 6,43mm. Postojeća razlika nije statistički značajna.

Tabela 3. Razlike meziodistalnog i vestibulolingvalnog promera i indeksa krune stalnih gornjih frontalnih zuba kod osoba sa malokluzijom III klase

Table 3. Differences in mesiodistal and vestibule lingual size and index of crown of upper frontal permanent teeth for persons with Class III malocclusion

Tooth	Sex	MD				VL				IC			
		n	X	SD	t-test	n	X	SD	t-test	n	X	SD	t-test
J1	m	20	8.45	0.56	0.57	20	7.10	0.84	0.25	20	121.2	21.1	0.32
	f	20	8.34	0.64		20	7.04	0.65		20	119.4	13.0	
J2	m	20	6.74	0.49	1.84	20	6.25	0.96	1.32	20	110.7	22.5	0.27
	f	20	6.43	0.57		20	5.93	0.54		20	109.2	12.9	
C	m	17	7.73	0.40	2.26*	17	7.86	0.66	2.64*	17	98.9	8.8	1.10
	f	17	7.42	0.40		17	7.29	0.59		17	102.3	9.4	

to 115.03 and with persons of female sex 119.24. There is significant difference in favour of persons of female sex (t-test 2.18) at the level of significance of $p < 0.05$. The mean value of index of crown of upper lateral incisors with persons of male sex amounts to 100.21 and with persons of female sex 104.95. There is gender difference (t-test 2.26, $p < 0.05$) in favour of persons of female sex.

Index of crown of lower incisors (table 2). The mean value of index of crown of lower central incisors with persons of male sex amounts to 82.76 and with persons of female sex 86.82. There is significant difference in favour of persons of female sex (t-test 2.78) at the level of significance of $p < 0.05$. The mean value of index of crown of lower lateral incisors with persons of male sex amounts to 92.10 and with persons of female sex 90.78. There is no present gender dimorphism.

Malocclusion of III class

Mesiodistal diameter of upper incisors (table 3). The mean value of mesiodistal diameter of upper central incisors with persons of male sex amounts to 8.45mm and with persons of female sex 8.34mm. There are no significant gender differences (t-test 0.57). The mean value of mesiodistal diameter of upper lateral incisors with persons of male sex amounts to 6.74mm and with persons of female sex 6.43mm. The existing difference is not statistically significant.

Meziodistalni promer donjih sekutića (tabela 4). Prosečna vrednost meziodistalnog promera donjih centralnih sekutića kod osoba muškog pola iznosi 5,50mm a kod osoba ženskog pola 5,48mm. Nema polnih razlika (t-test 0,14). Prosečna vrednost meziodistalnog promera donjih lateralnih sekutića kod osoba muškog pola iznosi 6,20mm, a kod osoba ženskog pola 5,95 mm. Postojeća razlika je na niskom nivou statističke značajnosti (t-test 1,61).

Mesiodistal diameter of lower incisors (table 4). The mean value of mesiodistal diameter of lower central incisors with persons of male sex amounts to 5.50mm and with persons of female sex 5.48mm. There are no gender differences (t-test 0.14). The mean value of mesiodistal diameter of lower lateral incisors with persons of male sex amounts to 6.20mm and with persons of female sex 5.95mm. The existing difference is at a low level of statistical significance (t-test 1.61).

Tabela 4. Razlike meziodistalnog i vestibulolingvalnog promera i indeksa krune stalnih donjih frontalnih zuba kod osoba sa malokluzijom III klase
Table 4. Differences in mesiodistal and vestibule lingual size and index of crown of lower frontal permanent teeth for persons with Class III malocclusion

Tooth	Sex	MD				VL				IC			
		n	X	SD	t-test	n	X	SD	t-test	n	X	SD	t-test
I 1	m	20	5.50	0.28	0.14	20	5.86	0.59	0.25	20	94.8	10.8	0.09
	f	20	5.48	0.38		20	5.81	0.57		20	95.1	10.5	
I 2	m	20	6.20	0.33	1.61	20	6.08	0.58	0.43	20	102.9	10.6	1.00
	f	20	5.95	0.62		20	6.01	0.40		20	99.4	11.5	
c	m	18	6.98	0.43	2.38*	18	7.21	0.89	1.22	18	97.7	9.4	0.58
	f	19	6.62	0.28		19	6.92	0.53		19	96.0	8.7	

Vestibulolingvalni promer gornjih sekutića (tabela 3). Prosečna vrednost vestibulolingvalnog promera gornjih centralnih sekutića kod osoba muškog pola iznosi 7,10mm a kod osoba ženskog pola 7,04mm. Nema polnih razlika (t-test 0,25). Prosečna vrednost vestibulolingvalnog promera gornjih lateralnih sekutića kod osoba muškog pola iznosi 6,25mm, a kod osoba ženskog pola 5,93mm. Nema značajnih polnih razlika (t-test 1,32).

Vestibulolinglual diameter of upper incisors (table 3). The mean value of vestibulolinglual diameter of upper central incisors with persons of male sex amounts to 7.10mm and with persons of female sex 7.04mm. There are no gender differences (t-test 0.25). The mean value of vestibulolinglual diameter of upper lateral incisors with persons of male sex amounts to 6.25mm and with persons of female sex 5.93mm. There are no significant gender differences (t-test 1.32).

Vestibulolingvalni promer donjih sekutića (tabela 4). Prosečna vrednost vestibulolingvalnog promera donjih centralnih sekutića kod osoba muškog pola iznosi 5,86mm, a kod osoba ženskog pola 5,48mm. Razlika među polovima nije statistički značajna (t-test 0,25). Prosečna vrednost donjih lateralnih inciziva kod osoba muškog pola iznosi 6,08mm, a kod osoba ženskog pola 6,01mm, što ukazuje na nepostojanje polne razlike (t-test 0,43).

Vestibulolinglual diameter of lower incisors (table 4). The mean value of vestibulolinglual diameter of lower central incisors with persons of male sex amounts to 5.86mm and with persons of female sex 5.48mm. The differences between sexes is not statistically significant (t-test 0.25). The mean value of lower lateral incisors with persons of male sex amounts to 6.08mm and with persons of female sex 6.01mm which points to nonexistence of gender difference (t-test 0.43).

Indeks krune gornjih sekutića (tabela 3). Prosečna vrednost indeksa krune gornjih centralnih sekutića kod osoba muškog pola iznosi 121,2 a kod osoba ženskog pola 119,4. Razlika među polovima nije statistički značajna (t-test 0,32). Prosečna vrednost indeksa krune gornjih lateralnih sekutića kod osoba muškog pola iznosi 110,7, a kod osoba ženskog pola 109,2. Rezultati ukazuju na nepostojanje polnog dimorfizma (t-test 0,27).

Indeks krune donjih sekutića (tabela 4). Prosečna vrednost indeksa krune donjih centralnih sekutića kod osoba muškog pola iznosi 94,8 a kod osoba ženskog pola 95,1. Nema značajne razlike među polovima (t-test 0,09). Prosečna vrednost indeksa krune donjih lateralnih sekutića kod osoba muškog pola iznosi 102,9, a kod osoba ženskog pola 99,4. Nema značajne razlike među polovima (t-test 1,0).

Uporedna analiza

S obzirom da su u prethodnim tabelama prikazane i komentarisane sve pojedinačne vrednosti po polovima kod osoba sa normalnom okluzijom i kod osoba sa malokluzijom III klase i kako su nađene polne razlike, razlike između grupa biće prikazane posebno kod osoba muškog i ženskog pola.

Ne postoje značajne razlike meziodistalnog promera gornjih centralnih i lateralnih sekutića između pacijenata sa malokluzijom III klase i sa normalnom okluzijom (J1 t-test 0,167; J2 t-test 0,190) (tabela 5).

Index of crown of upper incisors (table 3). The mean value of index of crown of upper central incisors with persons of male sex amounts to 121.2 and with persons of female sex 119.4. The difference between sexes is not statistically significant (t-test 0.32). The mean value of index of crown of upper lateral incisors with persons of male sex amounts to 110.7 and with persons of female sex 109.2. The results point to nonexistence of gender dimorphism (t-test 0.27).

Index of crown of lower incisors (table 4). The mean value of index of crown of lower central incisors with persons of male sex amounts to 94.8 and with persons of female sex 95.1. There is no significant difference between sexes (t-test 0.09). The mean value of index of crown of lower lateral incisors with persons of male sex amounts to 102.9 and with persons of female sex 99.4. There is no significant difference between sexes (t-test 1.0).

Comparative analysis

Considering the fact that, in the previous tables, there were shown and commented on all individual values as per sexes with persons with normal occlusion and with persons with malocclusion of III class and since gender differences were found, the differences between groups will be separately shown with persons of male and female sexes.

There are no significant differences of mesiodistal diameter of upper central and lateral incisors between patients with malocclusion of III class and with normal occlusion (J1 t-test 0.167; J2 t-test 0.190) (table 5).

Tabela 5. Razlike meziodistalnog i vestibulolingvalnog promera i indeksa krune gornjih i donjih stalnih frontalnih zuba kod osoba muškog pola sa normalnom okluzijom i malokluzijom III klase
Table 5. Differences in mesiodistal and vestibule lingual size and index of crown of upper /lower frontal permanent teeth for male persons with normal occlusion and with Class III malocclusion

Male		MD			VL			IC		
		J1	J2	C	J1	J2	C	J1	J2	C
I-III	t-test	0.167	0.190	1.730	3.134	1.384	0.608	1.244	2.020	2.143
	p	0.8686	0.8500	0.0924	0.0033**	0.1743	0.5469	0.2210	0.0504	0.0391*
I-III		I1	I2	c	I1	I2	c	I1	I2	c
	t-test	2.344	1.744	0.429	11.761	4.037	5.490	4.338	4.140	4.328
	p	0.0250*	0.0892	0.6704	0.0000***	0.0003***	0.0000***	0.0001***	0.0002***	0.0001***

Meziodistalni promer gornjih inciziva kod osoba ženskog pola takođe ne pokazuje značajne razlike između ispitivanih grupa (J1, t-test 0,256; J2, t-test 1,240) (tabela 6).

Mesiodistal diameter of upper incisors with persons of female sex do not either show significant differences between examined groups (J1, t-test 0.256; J2, t-test 1.240) (table 6).

Tabela 6. Razlike meziodistalnog i vestibulolingvalnog promera i indeksa krune gornjih i donjih stalnih frontalnih zuba kod osoba ženskog pola sa normalnom okluzijom i malokluzijom III klase
Table 6. Differences in mesiodistal and vestibule lingual size and index of crown of upper /lower frontal permanent teeth for female persons with normal occlusion and with Class III malocclusion

Female		MD			VL			IC		
		J1	J2	C	J1	J2	C	J1	J2	C
I-III	t-test	0.256	1.240	1.126	7.959	2.707	0.585	0.068	1.432	2.809
	p	0.7992	0.2211	0.2660	0.0000***	0.0094**	0.5615	0.9461	0.1585	0.0073**
I-III		I1	I2	c	I1	I2	c	I1	I2	c
	t-test	4.065	1.922	0.315	9.859	2.568	7.640	3.913	3.394	3.384
	p	0.0002***	0.0605	0.7539	0.0000***	0.0134*	0.0000***	0.0003***	0.0014**	0.0014**

Meziodistalni promer donjih inciziva kod osoba muškog pola je značajno veći kod osoba sa malokluzijom III klase u odnosu na normalnu okluziju (J1, t-test 2,33, $p < 0,001$; J2, t-test 1,74, $p < 0,01$) (tabela 5).

Mesiodistal diameter of lower incisors with persons of male sex is significantly bigger with persons with malocclusion of III class in relation with normal occlusion (J1, t-test 2.33, $p < 0.001$; J2, t-test 1.74, $p < 0.01$) (table 5).

Meziodistalni promer donjih inciziva kod osoba ženskog pola takođe pokazuje visok nivo značajnosti razlika u korist osoba sa malokluzijom III klase (J1, t-test 4.07, $p < 0,001$; J2, t-test 1,92, $p < 0,001$) (tabela 6).

Mesiodistal diameter of lower incisors with persons of female sex also shows high level of significance of differences in favour of persons with malocclusion of III class (J1, t-test 4.07, $p < 0.001$; J2, t-test 1.92, $p < 0.001$) (table 6).

Vestibulolingvalni promer gornjih inciziva kod osoba muškog pola veći je kod osoba sa malokluzijom III klase, značajna razlika postoji kod J1, t-test 3,13; $p < 0,01$; J2, t-test 1,38 (tabela 5).

Vestibulolingual diameter of upper incisors with persons of male sex is bigger with persons with malocclusion of III class, significant difference exists with J1, t-test 3.13, $p < 0.01$; J2, t-test 1.38 (table 5).

Vestibulolingvalni promer gornjih inciziva kod osoba ženskog pola pokazuje veće vrednosti kod pacijenata sa malokluzijom III klase na visokom nivou značajnosti J1, t-test 7,95; $p < 0,001$; J2, t-test 2,70; $p < 0,01$) (tabela 6).

Vestibulolingual diameter of upper incisors with persons of female sex shows higher values with patients with malocclusion of III class at high level of significance J1, t-test, 7.95, $p < 0.001$; J2, t-test 2.70, $p < 0.01$) (table 6).

Vestibulolingvalni promer donjih inciziva kod osoba muškog pola je značajno veći kod osoba sa malokluzijom III klase na visokom nivou značajnosti (J1, t-test 11,76, $p < 0,001$; J2, t-test 4.03, $p < 0,001$) (tabela 5).

Vestibulolingual diameter of lower incisors with persons of male sex is significantly bigger with persons with malocclusion of III class at high level of significance (J1, t-test 11.76; 0.001; J2, t-test 4.03, $p < 0.001$) (table 5).

Vestibulolingvalni promer donjih inciziva kod osoba ženskog pola je značajno veći kod osoba sa malokluzijom III klase na visokom nivou značajnosti (J1, t-test 9,85; J2, t-test 2,56; $p < 0,05$) (tabela 6).

Vestibulolingual diameter of lower incisors with persons of female sex is significantly bigger with persons with malocclusion of III class at high level of significance (J1, t-test 9.85; J2, t-test 2.56, $p < 0.05$) (table 6).

Indeks krune gornjih inciziva kod osoba muškog pola pokazuje značajno veće vrednosti kod pacijenata sa malokluzijom III klase u

Index of crown of upper incisors with persons of male sex shows significantly bigger values with patients with malocclusion of III class in relation

odnosu na osobe sa normalnom okluzijom (J1, t-test 1,24, $p < 0,001$; J2, t-test 0,02, $p < 0,01$) (tabela 5).

Indeks krune gornjih inciziva kod osoba ženskog pola takođe pokazuje veće vrednosti kod osoba sa malokluzijom III klase u odnosu na osobe sa normalnom okluzijom samo kod lateralnih inciziva (J2, t-test 1,43, $p < 0,01$) (tabela 6).

Indeks krune donjih inciziva kod osoba muškog pola je značajno veći kod osoba sa malokluzijom III klase u odnosu na normalnu okluziju (J1, t-test 4,33, $p < 0,001$; J2, t-test 4,14, $p < 0,001$) (tabela 5).

Indeks krune donjih inciziva kod osoba ženskog pola je takođe značajno veći kod osoba sa malokluzijom III klase u odnosu na normalnu okluziju (J1, t-test 3,91, $p < 0,001$; J2, t-test 3,39, $p < 0,001$) (tabela 6).

Diskusija

Veličina zuba je već dugi niz godina predmet interesovanja ortodontata. Prvi pisani podaci o veličini zuba potiču sa početka prošlog veka.²⁶ Od tada do današnjih dana objavljen je veliki broj radova koji se bave ispitivanjem uticaj nasleđa,⁷⁻⁹ pola⁷⁻¹² na veličinu zuba i povezanost veličine zuba sa nastankom ortodontskih anomalija. Izvestan broj autora u svojim radovima nalazi da osobe sa malokluzijom III klase imaju veće mandibularne zube u odnosu na osobe sa normalnom okluzijom^{11,19,20,21} dok su kod osoba sa malokluzijom II klase veći zubi u maksilarnom zubnom luku^{19,22,23} nego kod osoba sa normo-okluzijom. Istraživanja druge grupe autora ne dovode u direktnu vezu promere zuba sa nastankom ortodontskih anomalija.^{24,25}

Ispitivanja brojnih autora pokazuju da postoji polni dimorfizam u veličini meziodistalnog promera zuba i da se osobe muškog pola odlikuju krupnijim zubima⁷⁻¹². To se poklapa sa rezultatima našeg ispitivanja koji govore da su kod osoba sa normalnom okluzijom meziodistalni promeri gornjih i donjih sekutića veći u korist osoba muškog pola izuzev kod gornjeg lateralnog sekutića. Ovi rezultati poklapaju se sa nalazima prethodnih istraživača.^{27,28}

Vestibulolingvalni promer gornjih i donjih centralnih sekutića osoba sa normalnom okluzijom veći je kod osoba muškog pola i to na

with persons with normal occlusion (J1, t-test 1.24, $p < 0.001$; J2, t-test 0.02, $p < 0.01$) (table 5).

Index of crown of upper incisors with persons of female sex also shows bigger values with persons with malocclusion of III class in relation with persons with normal occlusion only with lateral incisors (J2, t-test 1.43, $p < 0.01$) (table 6).

Index of crown of lower incisors with persons of male sex is significantly bigger with persons with malocclusion of III class in relation with normal occlusion (J1, t-test 4.33, $p < 0.001$ and J2, t-test 4.14, $p < 0.001$) (table 5).

Index of crown of lower incisors with persons of female sex is also significantly bigger with persons with malocclusion of III class in relation with normal occlusion (J1, t-test 3.91; $p < 0.001$; J2, t-test 3.39, $p < 0.001$) (table 6).

Discussion

Size of teeth has already for a large number of years been subject of interest of orthodontists. The first written data on size of teeth date back since the beginning of the last century.²⁶ Eversince then up to the present days, there has been published a large amount of works that deal with investigating the influence of inheritance,⁷⁻⁹ sex⁷⁻¹², on size of teeth and connection of size of teeth with occurrence of orthodontic anomalies. Certain amount of authors in their works finds that persons with malocclusion of III class have larger mandibular teeth in relation with persons with normal occlusion^{11,19,20,21} while with persons with malocclusion of II class there are larger teeth in maxillary dental arch^{19,22,23} than with persons with normocclusion. Research of another group of authors does not bring into direct connection the diameters of teeth with the occurrence of orthodontic anomalies.^{24,25}

Examination of numerous authors shows that there exists gender dimorphism in size of mesiodistal diameter of teeth and that persons of male sex are characterized by larger teeth.⁷⁻¹² This coincides with results of our investigation which tell that with persons with normal occlusion the mesiodistal diameters of upper and lower incisors are bigger in favour of persons of male sex except with upper lateral incisor. These results coincide with findings of former researchers.^{27,28}

Vestibulolingual diameter of upper and lower central incisors of persons with normal occlusion is bigger with persons of male sex and that at a

visokom nivou statističke značajnosti od $p < 0,001$, što je prisutno i kod gornjih i donjih lateralnih sekutića ali na nižem nivou statističke značajnosti (J_2 , $p < 0,01$ odnosno J_2 , $p < 0,05$.)

Vrednosti indeksa krune zuba zavise od meziodistalnog i vestibulolingvalnog promera zuba. Ukoliko je širina zuba veća, biće veće i dobijene vrednosti indeksa, a ako je vestibulolingvalni promer veći, indeks će biti manji.

Prosečne vrednosti indeksa krune gornjih i donjih centralnih i lateralnih sekutića kod osoba sa normalnom okluzijom pokazuju razlike u korist osoba ženskog pola, na niskom nivou statističke značajnosti od $p < 0,05$.

Prosečne vrednosti meziodistalnog promera gornjih i donjih centralnih sekutića kod osoba sa malokluzijom III klase ne pokazuju polni dimorfizam dok kod gornjih i donjih lateralnih sekutića postoji statistički značajna ($p < 0,001$) u korist osoba muškog pola.

Vestibulolingvalni promer gornjih i donjih centralnih sekutića, kao i donjih lateralnih sekutića, ne pokazuje značajne polne razlike kod osoba sa malokluzijom III klase. Polni dimorfizam je prisutan jedino kod gornjih lateralnih sekutića na nivou $p < 0,01$ u korist osoba muškog pola.

Indeks krune gornjih i donjih centralnih sekutića kod osoba sa malokluzijom III klase muškog i ženskog pola pokazuju minimalne razlike, te nema statističke značajnosti.

Rezultati našeg ispitivanja pokazuju postojanje statistički značajnih razlika na visokom nivou značajnosti kako za meziodistalni tako i za vestibulolingvalni promer zuba a samim tim i vrednosti indeksa krune zuba u korist osoba sa malokluzijom III klase. Ovi se rezultati poklapaju sa nalazima prethodnih ispitivača.^{12,20,21,22}

Pored poznavanja svih ostalih dentalnih i rendgenkranimetrijskih karakteristika osoba sa malokluzijom III klase neophodno je proceniti i uticaj veličine zuba na definitivno formiranje okluzije što je od velikog značaja za određivanje plana terapije.

Zaključak

Na osnovu rezultata ispitivanja veličine sekutića kod pacijenata sa malokluzijom III klase i osoba sa normalnom okluzijom mogu se izvesti sledeći zaključci:

high level of statistical significance of $p < 0.001$ which is present also with upper and lower lateral incisors but at a lower level of statistical significance (J_2 , $p < 0.01$, J_2 , $p < 0.05$ respectively).

Values of index of crown of teeth depend on mesiodistal and vestibulolingual diameter of teeth. In case the width of the teeth is bigger, obtained index values will also be bigger and, if the vestibulolingual diameter is bigger, the index will be smaller.

Mean values of index of crown of upper and lower central and lateral incisors with persons with normal occlusion show differences in favour of persons of female sex, at a low level of statistical significance of $p < 0.05$.

Mean values of mesiodistal diameter of upper and lower central incisors with persons with malocclusion of III class do not show gender dimorphism while with upper and lower lateral incisors there is statistically significant difference ($p < 0.001$) in favour of persons of male sex.

Vestibulolingual diameter of upper and lower central incisors as well as lower lateral incisors does not show significant gender differences with persons with malocclusion of III class. Gender dimorphism is present only with upper lateral incisors at level of $p < 0.01$ in favour of persons of male sex.

Index of crown of upper and lower central incisors with persons with malocclusion of III class of both sexes shows minimal differences and therefore there is no statistical significance.

Results of our investigation show existence of statistically significant differences at a high level of significance both for mesiodistal and for vestibulolingual diameter of teeth and thereby for values of index of crown of teeth in favour of persons with malocclusion of III class. These results coincide with findings of former examiners.^{12,20,21,22}

Besides knowing of all the other dental and roentgenradiometric characteristics of persons with malocclusion Class III, it is necessary to assess the impact of tooth size on the final malocclusion formation as well, which is of great importance for determination of the therapy plan.

Conclusion

Based on results of investigation of size of incisors with patients with malocclusion of III class and persons with normal occlusion, there can be made the following conclusions:

1. Kod osoba sa normalnom okluzijom meziodistalni promer gornjih i donjih sekutića značajno je veći kod osoba muškog pola sa izuzetkom gornjih lateralnih sekutića.

2. Kod osoba sa normalnom okluzijom vestibulolingvalni promer gornjih i donjih sekutića je značajno veći kod osoba muškog pola.

3. Kod osoba sa normalnom okluzijom indeks krune sekutića je značajno veći kod osoba ženskog pola sa izuzetkom donjih lateralnih sekutića.

4. Kod osoba sa malokluzijom III klase meziodistalni promer gornjih i donjih lateralnih sekutića takođe je značajno veći kod osoba muškog pola.

5. Kod osoba sa malokluzijom III klase vestibulolingvalni promer gornjih i donjih sekutića je veći kod osoba muškog pola sa postojanjem značajne razlike kod gornjih lateralnih sekutića.

6. Kod osoba sa malokluzijom III klase ne postoji značajna razlika indeksa krune gornjih i donjih sekutića.

7. Osobe oba pola sa malokluzijom III klase se odlikuju značajno većim meziodistalnim promerom svih donjih sekutića u odnosu na normalnu okluziju.

8. Vestibulolingvalni promer gornjih inciziva kod osoba muškog pola veći je kod osoba sa normalnom okluzijom mada značajna razlika postoji samo kod centralnih sekutića, dok je vestibulolingvalni promer gornjih sekutića kod osoba ženskog pola veći kod pacijenata sa malokluzijom III klase sa postojanjem statistički visoko značajne razlike.

9. Vestibulolingvalni promer donjih sekutića kod osoba oba pola je veći kod osoba sa malokluzijom III klase na visokom nivou značajnosti u odnosu na normalnu okluziju.

10. Kod osoba oba pola indeks krune donjih sekutića je značajno veći kod osoba sa malokluzijom III klase u odnosu na normalnu okluziju, dok vrednosti za indeks krune gornjih centralnih sekutića kod osoba ženskog pola ne pokazuju statistički značajne razlike.

Pored poznavanja dentalnoalveolarnih i rendgenkranometrijskih karakteristika osoba sa malokluzijom III klase neophodno je proceniti i uticaj veličine zuba na definitivno formiranje okluzije što je od velikog značaja pri određivanju plana terapije.

1. With persons with normal occlusion, mesiodistal diameter of upper and lower incisors is significantly bigger with persons of male sex with the exception of upper lateral incisors.

2. With persons with normal occlusion, vestibulolingual diameter of upper and lower incisors is significantly bigger with persons of male sex.

3. With persons with normal occlusion, index of crown of incisors is significantly bigger with persons of female sex with the exception of lower lateral incisors.

4. With persons with malocclusion of III class, mesiodistal diameter of upper and lower lateral incisors is also significantly bigger with persons of male sex.

5. With persons with malocclusion of III class, vestibulolingual diameter of upper and lower incisors is bigger with persons of male sex with the existence of significant difference with upper lateral incisors.

6. With persons with malocclusion of III class, there is no significant difference of index of crown of upper and lower incisors.

7. Persons of both sexes with malocclusion of III class are characterized by significantly bigger mesiodistal diameter of all lower incisors in relation with normal occlusion.

8. Vestibulolingual diameter of upper incisors with persons of male sex is bigger with persons with normal occlusion although there is significant difference existing only with central incisors while vestibulolingual diameter of upper incisors with persons of female sex is bigger with patients with malocclusion of III class with the existence of statistically highly significant difference.

9. Vestibulolingual diameter of lower incisors with persons of both sexes is bigger with persons with malocclusion of III class at a high level of significance in relation with normal occlusion.

10. With persons of both sexes, index of crown of upper and lower incisors is significantly bigger with persons with malocclusion of III class in relation with normal occlusion while values for index of crown of upper central incisor with persons of female sex does not show statistically significant difference.

In addition to knowing dental alveolar and roentgenkranietric characteristics of persons with malocclusion of III class, it is necessary to estimate also the influence of size of teeth on definite forming of occlusion which is of great importance while determining the plan of the therapy.

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