Original Article

Relationship between Intercanine Distance with the Length of Index, Middle and Ring Fingers of Right Hand

Ravi Lal[1], Muhammad Rizwan Memon[1], Kashif Ali Channar[1], Irfan Ahmed Shaikh[1], Hina Memon[1] and Shazia Akbar[2]

ABSTRACT

Objective: This study was conducted to evaluate the correlation of width of the maxillary anterior teeth with the length of index, middle and ring fingers.

Study Design: Cross-Sectional Study

Place and Duration of Study: This study was conducted at the Department of Prosthodontics, Institute of Dentistry, Liaquat University of Medical and Health Sciences, Jamshoro from June 2019 to December 2020.

Materials and Methods: Maxillary casts were made from alginate impressions. An adaptable ruler was used to calculate the Inter-Canine Distance (ICD). The length of the patients' index, middle, and ring fingers was then measured with a vernier caliper with a precision of 0.01 mm from the tip of the finger to the lower border line of the fingers. Data was analyzed using SPSS version 17. Pearson's correlation coefficient was applied to find out the correlation among length of index, middle and ring finger with ICD.

Results: One hundred twenty volunteers participated in this study. The mean age was 24.30±3.304. The sample consisted of 66% males and 34 females. Descriptive statistics of the length of Index finger showed mean score 74.35±3.400, length of Middle finger showed mean score 82.22±3.417, length of Ring finger showed mean score 78.42±3.400, the ICD showed mean score 50.06±2.394. The correlation between length of Index, Middle and Ring fingers and ICD was positive and statistically significant (P-Value= 0.001).

Conclusion: It is concluded that there was significant correlation between the ICD and length of index, middle and ring fingers.

Key Words: Index finger, lateral asymmetry, linear growth, ring finger, sexual dimorphism

Citation of article: Lal R, Memon MR, Channar KA, Shaikh IA, Memon H, Akbar S. Relationship between Intercanine Distance with the Length of Index, Middle and Ring Fingers of Right Hand. Med Forum 2021;32(4):117-119.

INTRODUCTION

Edentulism affects every race worldwide with average rate round the world is reported to be 60% at the age of 60 years [1,2]. Oral rehabilitation of these patients is usually achieved through the fabrication of conventional complete dentures, implant supported removable or fixed prosthesis considering patient's acceptance and overall satisfaction as the main factor of importance [3,4].

1. Institute of Dentistry, Liaquat University of Medical & Health Sciences, Jamshoro, Sindh.
2. Department of Oral Pathology, Dow Dental College, Dow University of Health, Karachi.

Correspondence: Dr. Ravi Lal, Post Graduate Trainee, Institute of Dentistry, Liaquat University of Medical & Health Sciences, Jamshoro, Sindh.
Contact No: 0333-7213708
Email: lalravi592@gmail.com

Received: January, 2021
Accepted: February, 2021
Printed: April, 2021

Along with many other factors, a satisfactory cosmetic effect in any dental reconstruction has always been regarded as significant and it is likely that a well-made prosthesis would fail in the eyes of the patient if it is lacking in this regard[5]. For dental and facial aesthetics, proper anterior tooth selection in terms of size, form and shade as well as a harmonious balance with the surrounding oral environment is critical. The mesiodistal width of the maxillary central incisors is significant when selecting anterior teeth for completely edentulous subjects because they are the most prominent teeth in the arch when viewed from the front [6,7].

Various guidelines have been proposed for determining the size of teeth, such as the size of the face, the size of the maxillary arch, the incisive papilla and the canine eminence or buccalfrenum, the maxillo-mandibular relation, the contour of residual ridges, lips, and nasal width, but different opinions have been stated about their importance. Many attempts have been made to measure the selection of anterior teeth for removable prosthesis, but no consensus has been reached on an effective procedure [8,9]. The selection of maxillary anterior teeth for full dentures has proven to be a challenge in clinical practice, and there is still debate

about the best approach to use. Hence this study was conducted to evaluate the correlation of width of the maxillary anterior teeth with the length of index, middle and ring fingers.

MATERIALS AND METHODS

The ethical approval was sought from the committee of university. The informed written consent was taken from each participant. The participants were recruited with convenient sampling technique from the Department of Prosthodontics, Institute of Dentistry, Liaquat University of Medical and Health Sciences Jamshoro from June 2019 to December 2020. The inclusion criteria were participants having age range from 18 to 30 years of both genders, having no missing maxillary anterior teeth, having no gingival or periodontal conditions problems in anterior teeth, having no inter-dental spacing or crowding, having no anterior restoration and having no history of orthodontic treatment. The exclusion criteria were participants having supra-erupted teeth, having altered passive eruption of teeth, having developmental anomalies/ anodontia

Data Collection Procedure: Maxillary impressions were taken in metal perforated trays with irreversible hydrocolloid impression material and poured with dental stone type IV within 10 minutes. Using an adaptable ruler, the ICD of maxillary anterior teeth was calculated by measuring the distance between the distal points of the right and left canine teeth on a line perpendicular to the long axis from the cast. A putty impression of the largest finger (middle) was used to create an autopolymerised acrylic resin mould.

The length of the patients' index, middle, and ring fingers was then measured with a vernier caliper with a precision of 0.01 mm from the tip of the finger to the lower border line of the fingers. Each reading was taken three times in order to obtain an average value to be recorded in the proforma.

Data was analyzed using SPSS version 17. The quantitative variables like age, intercanine width, length of index, middle and ring finger was presented as mean and standard deviation. Frequency and percentage was calculated for gender. Pearson's correlation coefficient was applied to find out the correlation among length of index, middle and ring finger with ICD. P-value < 0.05 was considered as significant.

RESULTS

This research included a total of 120 patients. The mean age was 24.30±3.304 years (Table 1). Males were 66% and females were 34% (Figure-1). The mean score for length of index finger was 74.35±3.400, middle finger was 82.22±3.417, ring finger was 78.42±3.400 and ICD was 50.06±2.394(Table 2). The length of the index, middle, and ring fingers were found to have a positive and statistically significant association with ICD(P-Value= 0.001) (Table 3).

Table No.1: Age of Patients

Mean	24.30
Std. Deviation	3.304
Minimum	18 Years
Maximum	30 Years

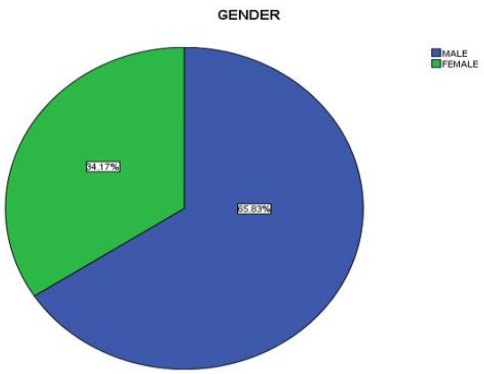

Figure No.1 Descriptive Statistics of Gender

Table No.2: Descriptive Statistics of the Length of Fingers & Inter Canine Width

	Mean	Std. Deviation
Length of index finger	74.3586	3.40001
Length of middle finger	82.2254	3.41720
Length of ring finger	78.4278	3.39890
Inter-canine width	50.0637	2.39463

Table No.3: Correlation Between Length of Fingers and Intercanine Distance

	length of finger	intercanine width
	index finger	
pearson correlation	0.688**	1
sig. (2-tailed)	0.001	
n	120	120
	middle finger	
pearson correlation	0.670**	1
sig. (2-tailed)	0.001	
n	120	120
	ring finger	
person correlation	0.677**	1
sig. (2-tailed)	0.001	
n	120	120

**. Correlation is significant at the 0.01 level (2-tailed)

DISCUSSION

Anterior tooth size selection is a great challenge for the clinician when the patient lacks pre-extraction records such as casts, photographs, radiographs and extracted teeth[10,11]. In the absence of these pre-extraction records, attempts have been made to use various anthropometric measurements as guides to estimate the size of artificial anterior teeth for the edentulous patient but to date, there has been no consensus on a reliable method for anterior tooth selection for the edentulous patient. [10-12] The length of fingers is some of the measurements that have been

explored as reliable guides to predict the mesio-distal width of anterior teeth for complete denture patients[13].

The findings of this research revealed a significant relationship between the maxillary anterior teeth and the index, middle, and ring finger lengths, which is consistent with the findings of Ahila SC et al[13], who discovered a significant relationship between the maxillary and mandibular anterior teeth and the index and little finger lengths.

In this analysis, the mesio-distal width had a mean score of 50.06±2.394. The findings of this study contradict those of caucasian populations, who recorded mean combined mesio-distal widths of maxillary anterior teeth ranging from 42.16mm to 60.33mm [14,15]. The variations in mean values may be attributed to ethnic distinctions between Caucasian and Asian populations, with Asian populations having smaller teeth than Caucasian counterparts, according to studies. The association between the length of the index finger and the inter-canine distance was found to be 0.688 in this analysis.

The findings of this study agreed with those of Ahila SC et al [13], who found that the actual value of total maxillary anterior width was strongly correlated to index finger length, with a correlation coefficient of 0.964. The significance level was 0.01.

ICD should be used only as reference value in estimations of central incisor width. Final tooth selection for edentulous subjects should be made in accordance with facial form[16]. The use of the right hamular notch to left hamular notch measurement plus 10 mm provides a useful method for 80 determining the width of the 6 maxillary anterior teeth for complete denture patients with medium and large cast sizes[17].

CONCLUSION

The maxillary anterior teeth were found to have a substantial relationship with the length of the index, middle, and ring fingers.

Author's Contribution:

Concept & Design of Study:	Ravi Lal
Drafting:	Muhammad Rizwan Memon, Kashif Ali Channar
Data Analysis:	Irfan Ahmed Shaikh, Hina Memon, Shazia Akbar
Revisiting Critically:	Ravi Lal, Muhammad Rizwan Memon
Final Approval of version:	Ravi Lal

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

1. Polzer I, Schimmel M, Muller F, Biffar R. Edentulism as part of the general health problems of elderly adults. IDJ 2010;60:143-155.
2. Esan TA, Olusile AO, Akeredolu PA, Esan AO. Socio- demographic factors and edentulism: The Nigerian experience. BMC Oral Hlth 2004; 4:1-6.
3. Allen PF, McMillan AS. A review of the functional and psychosocial outcomes of edentulousness treated with complete replacement dentures. J Can Dent Assoc 2003;69:662a-662e.
4. Roumanas ED. The social solution- denture aesthetics, phonetics and function. J Prosthodont 2009;18:112-5.
5. Van Victor A. The mould guide cast – Its significance in denture esthetics. J Prosthetic Dentist 1963;13:406-415.
6. Heatwell CM, Rahn AO. Syllabus of complete dentures, 4th ed. Lippincott William & Wilkins: Phildelphia; 1986.p.313–4.
7. Sanin C, Savara BS. Permanent mesiodistal crown size. Am J Orthod 1971;59:488–500.
8. Sellen PN, Jaggar DC, Harrison A. Methods used to select artificial anterior teeth for the edentulous patient: a historical overview. Int J Prosthodont 1999;12:51–8.
9. Varjao FM, Nogueira SS. Intercommissural width in 4 racial groups as a guide for the selection of maxillary anterior teeth in complete dentures. Int J Prosthodont 2005;18:513–5.
10. Fenton AH. Selecting artificial teeth for edentulous patients. Zarb Bolender. 12th ed. Complete dentures and implant-supported prostheses. Mosby (India);2004.p.298-314.
11. McCord JF, Grant AA. Registration: Stage III-selection of teeth. BDJ 2000;188:660-666.
12. Wehner PJ, Hickey JC, Boucher CO. Selection of artificial teeth. J Prosthet Dent 1967; 18:222-232.
13. Ahila SC, Vaishnavi P, Kumar BM. Comparative evaluation of maxillary and mandibular anterior teeth width with the length of index and little finger. J Ind Prosthodont Soc 2012;18.
14. Isa ZM, Tawfiq OF, Noor NM, Shamsudheen MI, Rijal OM. Regression methods to investigate the relationship between facial measurements and widths of the maxillary anterior teeth. J Prosthet Dent 2010;103:182-8.
15. Guldag MU, Buyukkaplan US, Sentut F, Ceylan G. Relationship between pterygomaxillary notches and maxillary anterior teeth. J Prosthodont 2009; 14:1-4.
16. Abdullah MA. Inner canthal distance and geometric progression as a predictor of maxillary central incisor width. J Prosthet Dent 2002;88:16–20.
17. Philip SB, Walter J, Carol AL, George AP, Stephen WL. The Relationship of denture cast measurements to width of maxillary anterior teeth. J Prosthet Dent 2010;105:44–50.