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RESEARCH ARTICLE

"THE RELATIONSHIP BETWEEN INTERCANTHAL WIDTH, INTERALAR WIDTH, COMBINED WIDTH OF FORE FINGER, MIDDLE FINGER, AND RING FINGER OF RIGHT HAND TO THE INTERCANINE WIDTH OF MAXILLARY ANTERIOR TEETH IN SOUTH INDIAN POPULATION- AN IN VIVO STUDY

Dr. Sanath Kumar Shetty[1], Dr. Amal K.[2], Dr. K. Md Asaraf[3] and Dr. Syed Mohamed Huzaifa A.H[4]

1. MDS, PhD, Head of Department, Yenepoya Dental College.
2. BDS, Post Graduate Student, Yenepoya Dental College.
3. BDS, Post Graduate Student, Yenepoya Dental College.
4. BDS, Post Graduate Student, Yenepoya Dental College.

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Key words:-
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Abstract

Purpose-The objective is to evaluate the relationship between Intercanthal width, interalar width, combined width of fore finger, middle finger, and ring finger of right hand to the intercanine width of maxillary anterior teeth in south Indian population

Materials and Methods- one hundred thirty six patients were evaluated for innercanthal, interalar, combined width of fore finger, middle finger, and ring finger of right hand to the intercanine width of maxillary anterior teeth, the study's statistical test was done by one-way ANOVA test.

Result-the values of Mean ± SD were Intercanine distance 40.510 ± 1.954, inter alar width 40.672± 1.785 eye width 37.969 ± 2.37 and combined finger width 40.397 ± 1.969 and df: 2, F: 11.578, p-value : 0.001($p<0.05$) were obtained which implies statistical significance.

Conclusion-Within the limitation of the study, it was concluded that there is a significant correlation between intercanine width and inter alar and combined width of three fingers. There is statistically significant difference has been noticed between intercanine and inter canthal distance.

Introduction:-

In order to achieve good aesthetics in a complete denture, a variety of aspects, including the size, colour, morphology, and placement of the anterior teeth, must be taken into consideration[1]. A significant psychological impact is had on the edentulous patient by the cosmetic rehabilitation. Maxillary anterior teeth are necessary for a pleasing smile and an attractive face. The loss of the maxillary anterior teeth alters facial symmetry and may be stressful psychologically. Therefore, a functional and aesthetically attractive substitute for lost teeth should be offered[2]. To restore ideal dentolabial connections that are harmonious with the appearance of the entire face, the proper anterior tooth size must be chosen when natural teeth are replaced[3].

The canine's position is crucial for the arrangement of denture teeth. Because it provides tissue support at the corner of the mouth[4]. Therefore, the primary aspect of total denture aesthetics to take into account is the position of the

Corresponding Author:- Dr. Amal K.
Address:- BDS, Post Graduate Student, Yenepoya Dental College.

canines. Additionally, choosing the size of the upper anterior teeth can benefit from knowing where the canines should be placed[5].

There have been numerous attempts to quantify the choice of anterior teeth for full dentures, but no agreement has been established on an effective method. Several anatomic measurements have been proposed to help in the assessment of a combined width of the maxillary anterior teeth, including bizygomatic width (BZW), interpupillary distance (IPD), interalar width (IAW), inter canthal distance (ICD), and intercommissural width (ICW) (intercanine width[6].

Hence this study deals with the relationship between innercanthal width, interalar width, and combined width of fore finger, middle finger, and ring finger of right hand to the intercanine width of maxillary anterior teeth in south Indian population- An in vivo study

Materials and Methodology:-

At 5% level of significance and standard deviation 11.91(standard deviation from related article) with 2% of margin of error the minimum sample size is **136**

The participants were selected according to the following criteria;
Individual between the age group 18-32
Healthy complement of teeth

Exclusion criteria

Patients who had fractured teeth, presence of any restoration, under orthodontic treatment, malaligned teeth, any systemic illness, periodontally compromised teeth, presence of any peg laterals or congenitally missing teeth, presence of diastema, presence of trauma from occlusion were excluded from the study

Intercanine distance, interalar distance, the distance between the inner and outer canthus of the right eye, and the width of the first three fingers of the right hand were measured. Use of a digital vernier calliper (fig-1) was made for all measurements. Data was gathered using IBM SPSS software, and MS Excel™ was used to tabulate it. Version 20.0 of SPSS Statistics Program for Windows was used for the statistical analysis.

The following output variables were measured: 1) the distance between the canines of the maxillary teeth (fig-2), 2) the width of the first three fingers on the right hand(fig-3), and 3) the distance between the inner canthus of the eye(fig-4) 4) inter alar distance(fig-5), the study's statistical test was the one-way ANOVA test.

Fig 1:-

Fig-2:-

Fig-3:-

Fig-4:-

Fig-5:-

Results:-

The one-way ANOVA test was used to compare the mean differences between the three variables intercanine width, eye width, inter alar width, and combined width of three fingersin right hand (measured in mm). the values of Mean ± SD were Intercanine distance 40.510 ± 1.954, inter alar width 40.672± 1.785 eye width 37.969 ± 2.37 and combined finger width 40.397 ± 1.969 and df: 2, F: 11.578, p-value : 0.001($p<0.05$) were obtained which implies statistical significance. A bar graph showing mean values for, four variables i.e., intercanine width, eye width inter alar width and combined finger width (table-1). The Pearson correlation coefficient values for variables were Intercanine distance × Eye width: 0.607*, Eye width × Finger width: 0.657** and Finger width × Intercanine distance: 0.856** inter alar width × inter canine width 0.776** (table 3). According to its interpretation, these values lie between ± 0.50 and ± 1 which implies strong correlation.

Table 1:- Bar graph showing mean values for, four variables i.e., intercanine width, eye width inter alar width and combined finger width.

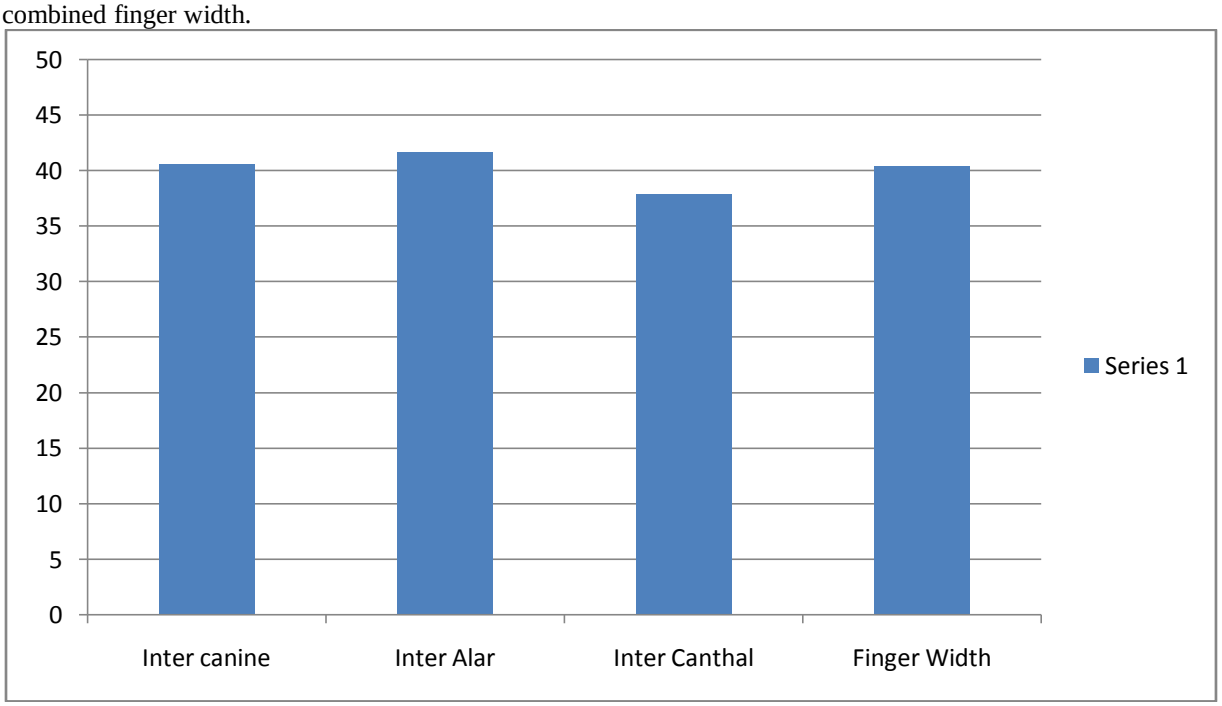

Table-2:- Comparison of mean difference among groups- inter canine, inter alar, inter canthal and width of fingers (measurement in mm).

		ANOVA				
	MEAN±SD	STANDARD ERROR	95% CONFIDENCE INTERVEL	DF	F	P VALUE
INTER CANINE	40.510 ± 1.954	0.39	39.70	2	11.54	0.001
INTER ALAR	40.672± 1.785	0.43	40.78	2	11.54	0.001
INTER CANTHAL	37.969 ± 2.37	0.45	36.93	2	11.54	0.001
WIDTH OF FINGERS	40.397 ± 1.969	0.393	39.64	2	11.54	0.001

Table 3:- Correlation between inter canine, inter alar, inter canthal and width of fingers.

	INTER CANINE	INTER ALAR	INTER CANTHAL	WIDTH OF FINGERS
PEARSON CORRELATION	0.89	1	0.74	0.45
SUM OF SQUARES AND CROSS-PRODUCTS	197.67	178.30	163.90	180.32
COVARIANCE	5.83	7.89	6.21	5.34
N	50	50	50	50

Discussion:-

In this present study, 136 participants were evaluated for inter canine, inter alar, inter canthal and width of three fingers or right hand. One-way ANOVA test findings revealed a significant association between the combined width of the right hand's three fingers and the intercanine and interalar distances. The distance between two medial canthus and inter alar distance to intercanine distance showed marked difference and average of 3.67 ±1.78. For selecting maxillary anterior teeth these parameters can be used. Pearson's correlation was done for the given variables inter canine, inter alar, and inter canthal and width of three fingers. The values were found between ±0.5 and ±1which imply stronger correlation. The intercanine, width of three fingers and inter alar widthwas more towards 1 and thus has a stronger correlation.

In 1980, Mavroskoufis et al. discovered that the inter ala-nasal width is a reliable indicator when choosing the mold for the anterior teeth and that the incisive papilla provides as a reliable anatomical landmark for placing the labial surfaces of the central incisors at a distance of 10 mm from the posterior border of the papilla. Abdullah MA et al. observed no link between the measurement of interpupillary distance and intercanine distance, and no correlation was identified when the population was subdivided based on gender. Abdullah et al in 2002 concluded that Intercanine distance should only be utilised as a reference for determining the width of the central incisor. For edentulous people, the final teeth should be chosen based on facial structure.

The anthropometric measurement employed depends on the population group being used, according to a systematic review by Ashish Jain et al, 2) the width of the maxillary anterior teeth cannot be determined by a single anthropometric measurement. 3) In the Indian population, there was a strong association between the breadth of the maxillary anterior teeth, the bizygomatic width, and the inter-alar and inter-pupillary distances.

The limitation of the present study includes the study was done in a smaller population; more conclusive results can be achieved only after evaluation in a larger population. Inter alar distance and width of three fingers (index middle and ring finger) can be used as a guide for selection of maxillary anterior teeth.

Conclusion:-

Within the limitation of the study, it was concluded that there is a significant correlation between intercanine width and inter alar and combined width of three fingers. There is statistically significant difference has been noticed between intercanines and inters canthal distance.

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