

ORIGINAL RESEARCH

The Selection of Maxillary Anterior Teeth Width in Kashmiri Population

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ABSTRACT

Introduction: Determining the width of maxillary anterior teeth is a difficult aspect in complete denture fabrication. The width of maxillary anterior teeth is determined by taking various anatomical landmarks on the face as a guide, such as the interpupillary, interalar, intercommissure and interzygomatic distance, etc. The present clinical study was carried out to evaluate the relationships between maxillary anterior teeth measurements (canine to canine and central incisor width) and various horizontal facial parameters.

Materials and methods: The facial and dental measurements were obtained directly from 60 Kashmiri undergraduate dental students by using vernier calliper and dental floss.

Result: Correlation analysis was done using Pearson's correlation analysis and it was determined that the incisor width and canine to canine distance show positive correlation with some of the facial measurements.

Conclusion: This study inferred that while most of the measurements showed a positive correlation with the incisor width and canine width in the different face forms none of them were found to be significant.

Keywords: Complete dentures, Esthetics, Incisor width.

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INTRODUCTION

Denture esthetics is an outcome of dental prosthesis that affects the beauty and attractiveness of the person. Beauty is primarily interpreted from its proportion, perspective and lighting. Face excels in beauty when compared to

other anatomical divisions of the human being and beauty of face in-turn depends on a perfect smile. In complete denture patients perfect smile can be achieved by selecting appropriate anterior teeth.

Nature tends to harmonize not only the form of the maxillary central incisors with the form of the face; but also with the form of the arch and arrangement of the teeth. People with predominantly square faces often have mainly square arrangements of teeth. In general, these same principles of harmony apply to the square tapering, and ovoid types.¹

Determining the width of maxillary anterior teeth is a difficult aspect in complete denture fabrication.² Many studies have been done to determine the width of maxillary anterior teeth by taking various anatomical landmarks on the face as a guide, such as the interpupillary, interalar, intercommissure and interzygomatic distance.³⁻⁶ More than one facial measurement could be used as predictor of maxillary anterior teeth width.

The aim of this study is to determine if any relationship exists between maxillary anterior teeth measurements (canine to canine and central incisor width) and different horizontal parameters for predicting proper width of maxillary anterior teeth in different face forms in the Kashmiri population and whether it can be used as a reliable guide in selection of maxillary anterior teeth.

MATERIALS AND METHODS

The data for this study were collected at the Government Dental College, Srinagar from 60 female dental students with different face forms. These 60 subjects were further divided into three groups of equal number according to their face forms. Each consisting of 20 subjects with ovoid face form, 20 of tapering face form and 20 of square face form.

Subjects with the following criteria were included in the study: Subjects with Angle's class 1 molar relation, proper alignment with tight contact and teeth periodontally sound. Subjects with any malocclusion, with history of congenital anomaly, orbital disease, trauma, facial surgery or orthodontic treatment were excluded.

The armamentarium used in the study were the trubyte tooth indicator (Dentsply) which determines the facial form, vernier caliper and dental floss for measuring the mesiodistal width of the maxillary anterior teeth.

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The facial parameters that were measured are as follows:

- Interzygomatic distance (IZD)
- Inner and outer canthal distances (ICD and OCD)
- Mouth width (MW)
- Nose width (NW)
- Interpupillary distance (IPD)
- Philtrum width (PW).

The subject was seated comfortably in the dental chair in a relaxed state and in an upright position. The vernier calliper was placed and average of three readings of all measurements was taken. The lips were then retracted with the help of a cheek retractor and dental floss is adapted at the distal surfaces of the canines on both sides (CC) and this is measured with a Vernier caliper. The width of the central incisor (IW) is also recorded in the same manner. A trubyte tooth indicator is used to determine the face form and the subjects are divided into three groups: Group I with ovoid face form, group II with tapering face form and group III with square face form.

The statistical analysis is done using Karl Pearson's correlation coefficient.

RESULTS

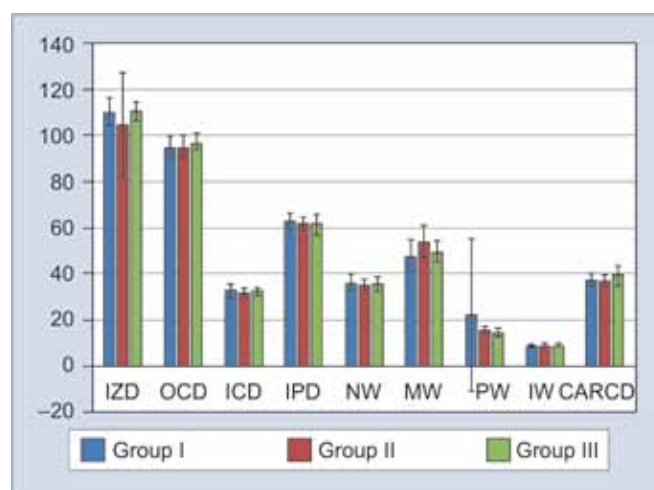
Correlation analysis was done using Pearson's correlation analysis.

The means and standard deviation is given in Tables 1 to 3 respectively for groups I, II and III and represented in Graph 1.

In group I with regard to the variables IW and CC and all other variables (Table 4), the correlation shows that

variables IZD, OCD, IPD, NW, MW showed positive correlation with IW while ICD, PW showed negative correlation. While none of the variables was significant in relation to IW while PW presented the minimum p-value of 0.06. The table further shows that correlation shows that variables OCD, ICD, IPD, NW, MW showed positive correlation with canine to canine (CC) while IZD, PW showed negative correlation. While none of the variables was significant in relation to CC while PW presented the minimum p-value of 0.07.

In group II with regard to the variables IW and CC and all other variables (Table 5), the correlation shows that variables IZD, NW, PW showed positive correlation with IW while OCD, ICD, and MW showed negative correlation. While OCD, ICD were significant in relation to



Graph 1: The comparative bar diagram of the mean and standard deviation of three groups

Table 1: The mean and standard deviation of group I. The highest deviation from mean was recorded in IW

Group I	IZD	OCD	ICD	IPD	NW	MW	PW	IW	CC
Mean	110.10	94.40	32.400	62.750	36.450	47.58	12.07	8.855	37.350
± SD	5.89	5.36	2.780	3.214	3.677	7.06	2.74	0.764	3.100
Number	20	20	20	20	20	20	20	20	20

Table 2: The mean and standard deviation of group II

Group II	IZD	OCD	ICD	IPD	NW	MW	PW	IW	CC
Mean	104.78	94.95	32.200	61.700	35.075	53.95	15.375	9.050	36.575
± SD	22.48	4.88	1.795	2.958	2.273	6.72	1.202	0.841	2.871
Number	20	20	20	20	20	20	20	20	20

Table 3: The mean and standard deviation of group III

Group III	IZD	OCD	ICD	IPD	NW	MW	PW	IW	CC
Mean	110.35	97.500	32.400	61.30	35.450	49.30	14.650	9.100	39.150
± SD	4.44	3.472	1.635	4.61	3.086	4.47	1.531	0.883	4.196
Number	20	20	20	20	20	20	20	20	20

Table 4: Relation of IW and CC with all variables in group I

Group I		IZD	OCD	ICD	IPD	NW	MW	PW	IW	CC
IW	(r-value)	0.021	0.125	-0.236	0.244	0.146	0.132	-0.417	—	-0.044
	(p-value)	0.930	0.599	0.316	0.300	0.538	0.579	0.067	—	0.853
CC	(r-value)	-0.011	0.064	0.282	0.308	0.249	0.154	-0.413	-0.044	—
	(p-value)	0.964	0.789	0.228	0.187	0.290	0.517	0.070	0.853	—

Table 5: Relation of IW and CC with all variables in group II

Group II		IZD	OCD	ICD	IPD	NW	MW	PW	IW	CC
IW	(r-value)	0.154	-0.557	-0.617	0.099	0.239	-0.256	0.228	—	-0.007
	(p-value)	0.518	0.011*	0.004*	0.677	0.311	0.277	0.334	—	0.976
CC	(r-value)	-0.061	-0.321	-0.417	-0.258	0.066	0.077	0.140	-0.007	—
	(p-value)	0.798	0.168	0.068	0.273	0.783	0.748	0.556	0.976	—

*Significant at ≤ 0.05 **Table 6:** Relation of IW and CC with all variables in group III

Group III		IZD	OCD	ICD	IPD	NW	MW	PW	IW	CC
IW	(r-value)	0.192	0.137	0.299	-0.208	0.089	0.219	0.027	—	0.564
	(p-value)	0.417	0.563	0.200	0.378	0.709	0.354	0.909	—	0.010*
CC	(r-value)	0.164	0.045	0.075	0.139	-0.127	-0.003	0.181	0.564	—
	(p-value)	0.490	0.850	0.753	0.559	0.592	0.992	0.446	0.010*	—

*Significant at ≤ 0.05

IW. The table further shows that correlation shows that variables NW, PW showed positive correlation with CC while IZD, OCD, ICD, IPD, and IW showed negative correlation. While none of the variables was significant in relation to CC.

In group III with regard to the variables IW and CC and all other variables (Table 6), the correlation shows that variables IZD, OCD, ICD, NW, MW, PW, and CC showed positive correlation with IW while IPD showed negative correlation. Canine to canine was significant in relation to IW. The table further shows that correlation shows that variables IZD, OCD, ICD, IPD, IW, PW showed positive correlation with CC while NW, MW showed negative correlation. Central incisor width was significant in relation to canine to canine.

DISCUSSION

For years researchers have been studying various facial measurements that can better guide the clinician in establishing good esthetics and selection of teeth in complete denture construction some of which are the interpupillary width, outer canthus distance, inner canthus distance, etc. In this study, the measurements of central incisor width (IW) and canine to canine (CC) were taken into considerations as these play a more important role in governing the esthetics of the facial appearance.

The results obtained in this study for the mean widths of nose, mouth and philtrum and IPD were nearly same as those obtained by Latta,⁶ Hoffman et al² and Nagham.⁷ Those of OCD and ICD coincided with Mohammed's⁸ and Nagham's⁷ result.

The results of this study show that there is a positive correlation regarding some of the measurements as compared to the incisor with and canine to canine width. However, none of the results were found to be significant in any of the facial forms.

The disadvantage of anthropometric measurements include variation in measurement due to operator error

and instrument error due to slipping or movement of the measuring devices, fluctuation and misjudgment estimating the bizygomatic width, which incorporates measurement and operator bias and relatively complex computation to arrive at the estimates.⁹

CONCLUSION

This study inferred that while most of the measurements showed a positive correlation with the incisor width and canine width in the different face forms none of them were found to be significant. Therefore, it is preferable to use some other methods of determining the width of central incisor and canine to canine distance like pre-extraction records, pretreatment photographs, etc. which will help to establish better aesthetics.

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