ORIGINAL ARTICLE

Correlation of intercanthal and interalar distance to intercanine distance for the selection of maxillary anterior teeth for Prosthetic rehabilitation in Pakistani Population

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ABSTRACT

Background: Maxillofacial region's reference points like interpupillary distance, intercanthal distance, interalar distance and bizygomatic width can significantly contribute toward reconstruction of two-dimensional (2D) facial profiles.

Aim: To find correlation between intercanthal to intercanine and interalar to intercanine distance for maxillary anterior teeth selection.

Methodology: This study was conducted at de' Montmorency College of Dentistry/ Punjab Dental Hospital, Lahore from 29-08-2013 to 28-04-2014. Sampling technique was non-probability purposive. 200 subjects are estimated for correlation of intercanthal distance to intercanine distance and correlation of interalar distance to intercanine distance as r=0.302.

Results: Out of 200 cases, 102(51%) were 20-40 years of age while 98(49%) were ranging between 41-60 years of age, mean±SD was calculated as 41.01±11.90 years, 135(67.5%) were male and 65(32.5%) were females, correlation among maxillary intercanine distance with other facial land marks shows the distance of intercanine was 37.26±3.91, it was 41.26±4.57 for interalar and 34.50±2.51 was recorded for intercanthal, the value of R^2, the coefficient of determination, is 0.0893 for intercanine to intercanthal and 0.0018 for intercanine to interalar.

Conclusion: We concluded that intercanthal distance to intercanine distance is more correlated as compared to interalar distance to intercanine distance in Pakistani population.

Keywords: Maxillary anterior teeth, intercanthal distance, intercanine distance, interalar distance, correlation

INTRODUCTION

Esthetics is one of the primary considerations of prosthodontic patients besides functional restoration. The shape and size of the maxillary anterior teeth contribute in restoring normal function; esthetic phonetics and mastication[1]. In order to fulfill the functional and aesthetic demands its mandatory to restore the artificial maxillary anterior teeth in the same position as that of natural predecessors[2,3].

Patient's natural teeth record must be obtained as they are the best guide for selection of artificial teeth[4,5]. Various guides are in use for selection of anterior teeth which include pre-extraction records, patient's gender, bizygomatic width, inter commissural width, interalar width and intercanthal width[6].

Intercanthal distance, the distance between the medial angles of the eyes is one of the facial landmarks that can be used for selection of artificial teeth[7]. According to Abdullah, maxillary intercanine distance is in golden proportion to the intercanthal distance[8,9]. Lucas has reported positive correlation i.e. r= 0.302 of which p ≤ 0.006 between the intercanthal distance and the combined width of maxillary anterior teeth[3].

Interalar width can also be used for the selection of anterior maxillary teeth[1]. Rathika Rai has found significant relationship between interalar and intercanine distance with r=0.93 which varies in squarish (p≤0.01) & ovoid (p≤0.05) arch forms[10].

Proper anterior teeth selection is a main challenge for a prosthodontist even these days. If the selection of teeth not properly done, it will affect the facial aesthetics and result in psychological trauma and inadaptability of the denture in the long run. As the measurements of different facial land marks varies in different racial population and as there is no definitive guideline for the maxillary anterior teeth selection. This study used simple facial landmarks combination such as intercanthal distance and interalar distance for prosthodontic rehabilitation in Pakistani population. Any significant relationship will be useful for edentulous state.

MATERIALS AND METHODS

Total 200 patients fulfilling the inclusion and exclusion criteria were selected from outdoor department of Punjab Dental Hospital, Lahore. Age range from 20 to 60 years, Angle's Class I occlusion and healthy anterior teeth was the Inclusion Criteria. Patient having history of orthodontic treatment, trauma and congenital or acquired facial defects were excluded.

Informed consent was taken from each patient. Patients underwent a thorough history and clinical examination. To measure the interalar distance two points were marked on either side of the nose with the fine tip marking pen indicating the widest point in the outer surface of the ala of the nose. The distance was measured using a Vernier caliper. While taking the measurements patient was asked to hold the breath. Each measurement was the mean of three readings. Intercanthal distance was measured with a Vernier caliper to the nearest tenth of a millimeter. Each measurement was the mean of three readings. To determine the intercanine distance alginate impression of maxillary arch was taken in stock tray. Impression was poured in dental stone. Standard water powder ratio was used as advised by manufacturer. The width of anterior maxillary teeth was measured with a divider. Each measurement was the mean of three readings.

Data analysis: SPSS version 16 was used for data analysis. Quantitative variables intercanthal distance and interalar distance was presented as mean and ±standard deviation. Qualitative variable i.e. sex presented in frequency and percentages. Correlation between maxillary intercanine width with other facial land marks was determine by Pearson's correlation coefficient. P-value < 0.05 was considered significant.

RESULTS

Age distribution of the patients was done, it shows that 102(51%) were 20-40 years while 98(49%) were 41-60 years of age, mean±SD calculated as 41.01±11.90 years.

Table 1: Age distribution (n=200)

Age(in years)	n	%age
20-40	102	51
41-60	98	49
Total	200	100
Mean±SD	41.01±11.90	

Patients distribution according to gender shows 135(67.5%) were male and 65(32.5%) were females.

Table 2: Gender distribution (n=200)

Gender	n	%age
Male	135	67.5
Female	65	32.5
Total	200	100

Correlation among maxillary intercanine distance with other facial land marks shows the distance of intercanine was 37.26±3.91, it was 41.26±4.57 for interalar and 34.50±2.51 was recorded for intercanthal, the value of R^2, the coefficient of determination is 0.0893 for intercanine to intercanthal and 0.0018 for intercanine to interalar (Table 3 & 4)

Table 3: Correlation among maxillary intercanine distance with interalar distance shows the distance of intercanine (n=200)

Distance	Mean	SD
Intercanine	37.26	3.91
Intercanthal	41.26	4.57

The value of R^1, the coefficient of determination, is 0.0018.

Table 4: Correlation among maxillary intercanine distance with intercanthal distance shows the distance of intercanine (n=200)

Distance	Mean	SD
Intercanine	37.26	3.91
Intercanthal	34.51	2.50

The value of R^2, the coefficient of determination, is 0.0893.

DISCUSSION

Current study planned with the view to use the simple facial landmarks combination such as intercanthal distance and interalar distance for prosthodontic rehabilitation in Pakistani population. Any significant relationship may be useful for edentulous state.

This study showed correlation among maxillary intercanine distance with other facial land marks. The distance of intercanine was 37.26±3.91, it was 41.26±4.57 for interalar and 34.50±2.51 was recorded for intercanthal, the value of R^2, the coefficient of determination, is 0.0893 for intercanine to intercanthal and 0.0018 for intercanine to interalar.

A study conducted in Indian population found significant correlation of intercanthal width with combined maxillary anterior teeth width with coefficient of determination (r= 0.850) near to this study (0.0893)[7].

Rathika Rai and others found significant relationship between interalar and intercanine distance with r=0.93 which varies in squarish (p≤0.01) & ovoid (p≤0.05) arch forms[10].

Another study ascertained significant relationship of interpupillary distance, intercanthal distance, interalar distance and bizygomatic width and concluded inter canine distance could be used as an important parameter for two dimensional reconstruction of face[11]. .

Tripathi S conducted a study in north Indian population and found strong correlation between the intercanthal and interalar width with intercanine distance. This significant correlation suggested that interalar width can be used as a reliable guide for maxillary anterior teeth selection[12]. However, in our study intercanthal was more correlated with intercanine.

Another study conducted in Sudanese population also concluded and found significant correlation between intercanthal and maxillary intercanine distance (P-value 0.015)[13].

Our study demonstrated that intercanthal distance is more reliable in our population. However, some other trials in different regions of the country should also be done to evaluate these findings for reference values in respective populations.

CONCLUSION

This study concluded that intercanthal distance to intercanine distance is more strongly correlated as compared to interalar distance to intercanine distance for maxillary anterior teeth selection in Pakistani population.

Limitations: In this study, the subjects were Pakistani population of Punjab origin. Thus, result derived is more applicable to the population evaluated. To overcome this limitation, comparisons with other ethnic populations should be evaluated and differences should be considered before application to other population.

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