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RESEARCH ARTICLE

CORRELATION OF THE MESIO-DISTAL WIDTH OF BASE OF THE PHILTRUM TO THE COMBINED MESIO-DISTAL WIDTH OF THE MAXILLARY CENTRAL INCISORS IN DAKSHIN KANNADA POPULATION-AN IN VIVO STUDY

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ABSTRACT

Aims and Objective: To correlate the mesio-distal width of base of the philtrum to the combined mesio-distal width of the maxillary central incisors in males and females.

Materials and Methods: A total of 70 individuals who were native of Dakshina Kannada region with an age ranging from 19 - 23 years male and females were selected for this study. Two most prominent points were marked at base of philtrum. These points were marked by drawing a line along the vertical ridge of philtrum and marking a point where they meet the vermillion border of upper lip. The width between these two points were measured by vernier calipers to the fraction of 1/10th of a millimetre. After doing a brief oral examination, proper size perforated rim lock stock tray was selected. Alginate impression powder was mixed with water and maxillary and mandibular impressions were made and the casts were poured immediately. Base was made for the casts and the casts thus obtained were mounted at maximum intercuspation. Dial vernier caliper (with 0.01 mm accuracy) was used for the cast measurements. The measurements were obtained from the patient and also on the dentulous cast in mm, average value was tabulated and analyzed statistically.

Results: There was highly significant correlation ($p<0.001$ & $r= 0.831$) between mean width of base of the philtrum and the combined width of maxillary central incisors in both the sexes.

Conclusion: There is correlation between the mesio-distal width of base of the philtrum to the combined mesio-distal width of maxillary central incisors among males and females which can be used as a guide for selecting the width of artificial maxillary central incisors among Dakshina Kannada, Karnataka population.

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INTRODUCTION

Fabrication of complete denture requires a synchronised and coordinated steps of the procedure. Selection of teeth is an important step in the fabrication of complete denture, which can lead to disappointment if do not meet up the patient's satisfaction. Earlier, there were no specific methods and landmarks to determine the required size and form of tooth. Most methods involved "hunt and peck" or "trial and error" until the patient and dentist were satisfied with the particular size of a tooth. Later methods revealed a dependence on physical characteristics of the dentofacial form. Pound1 stated that, there are five specific parameters which must work together in harmony to restore facial appearance and function for edentulous patients. These includes the size, form, color, arrangement, and framing of the teeth. The size, form and colour of teeth should be in harmony with surrounding oral and facial structures and the number, size and shape of teeth vary among different ethnic groups. The mesio-distal width of the teeth is more critical than the length. In the absence of pre-extraction records, selection of an ideal anterior teeth for edentulous patient becomes a difficult task. It is difficult to determine the mesio-distal dimensions of the maxillary anterior teeth for an edentulous patient when pre-extraction records are not available. Many anthropometric measurements of the face have been suggested to determine the mesio-distal width of maxillary central incisors in particular for edentulous patients but there seems to be few reliable guidelines and many conflicting views. Many other methods have also been presented to aid in teeth selection like Berry's biometric ratio method and Anthropometric cephalic index method3, but these methods are not specific. However no predictor has been found to be accurate enough to predict the dimensions of the maxillary central incisors. Young recommended the development of operator esthetic sense as most effective. Actual tooth size and morphology are addressed in dental literature. But as racial variation has its effect over the tooth

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size, knowledge of racial norms may help specify certain aesthetic and functional modifications in treatment plans and apply them scientifically. The purpose of this in vivo study was to correlate the mesio-distal width of base of the philtrum to the combined mesio-distal width of the maxillary central incisors in males and females.

Review of literature

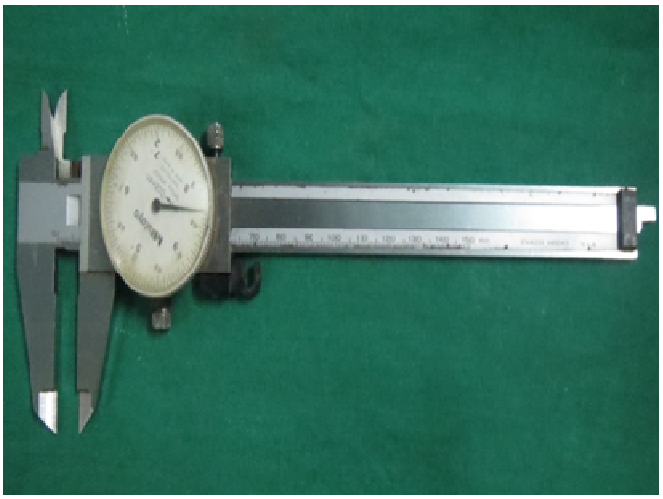
Smith (1975) performed a atudy on 80 men and women using to measure the interalar and interalar-fold widths of the nose using radiographic method. From his results, he concluded that There was no significant relationship between the intercanine distance and the interalar width of the nose and width of the nose would not be a reliable guide for selecting or arranging artificial anterior teeth. Hoffman, Bomberg, Hatch (1986) concluded that a weaker but definite correlation coefficient of 0.217 was observed when the interalar width plotted against the circumferential arc distance from distal surface to distal surface of the maxillary canines. Keng SB (1986) concluded that there was no demonstrable correlation between interalar width of nose and intercanine distance. Dharap, Tanuseputro (1997) performed a study to measure interalar width of the nose and the intercanine distance in 266 Malay subjects (111 males and 155 females) and concluded that there is a significant correlation ($r = 0.312$; $p < 0.05$) between the nasal width and the intercanine distance in female subjects but not in male subjects. Strajnić, Vuletić, Vucinić (2013) done a study to and concluded that the examined interalar width and inner canthal distance cannot be considered reliable guidelines in the selection of artificial upper anterior teeth. Reddy, Swetha, Guruprasad (2014) concluded that proportion of Inter alar distance to Width of the root of the nose seems to be a reliable guide for deciding the proportion of the maxillary central and lateral incisor width. The Inter canthal distance, when multiplied by a decreasing function value of the geometric progression term 0.618 and divided by 2, was a reliable predictor of the maxillary central incisor width. Furtado, Furtado, El Haje, Butignon, Pesqueira, Paranhos (2014)[53] designed a study to assess the relationship between horizontal and vertical measurements of the face and the morphology of the maxillary central incisor. The majority of cases showed that horizontal and vertical measurements of the face cannot be used as a reference for determining the morphology of the maxillary central incisor crown. It is relevant to analyze and compare other morphological structures to improve the oral health-related quality of life for the conventional denture wearer.

MATERIALS AND METHODS

The present study was carried out in the Department of Prosthodontics Including Crown & Bridge and Implantology, K.V.G. Dental College and Hospital, Sulia. A total of 100 individuals who were native of Dakshina Kannada region were selected for this study as per the designed inclusion and exclusion criteria.

Measurement of the width of philtrum

After selecting the subject suitable for the study, procedure was explained to them and after obtaining their consent, they were seated on a dental chair in an upright position and draped and lips lightly touching each other. It was ensured that lips are in a completely in relaxed position. Two most prominent points were marked at base of philtrum. These points were marked by drawing a line along the vertical ridge of philtrum and marking a point where they meet the vermillion border of upper lip. The width between these two points were measured by vernier calipers to the fraction of 1/10th of a millimeter. All the measurements were recorded using a caliper with a precision of 0.01 mm.



Dial vernier caliper (Mitutoyo Ltd. 505-633-50)

Measurement of combined mesio-distal width of maxillary central incisors

After doing a brief oral examination, proper size perforated rim lock stock tray(S S WHITE) was selected. Alginate impression powder (Velplast ISO 1563:1990/ADA 18/BS 4269) was mixed with water according to manufacturer instructions with 1:2.6 (proportion by weight) water / powder ratio in flexible rubber bowl with curved stainless steel spatula by spatulating it in figure of eight motion then swiping and stropping it against the rubber bowl walls. Impression tray was loaded and maxillary and mandibular impressions were made and the casts were poured immediately. Dental stone was taken in proper powder liquid ratio and spatulated in rubber bowl with wide blade straight stainless steel spatula. After one hour, casts were recovered, damaged cast were discarded and impression were remade. Base was made for the casts using base former and the casts thus obtained were mounted at maximum intercuspation and sealed with sticky wax posteriorly at the premolar and molar.

The measurements on dentulous cast were made in following way

Dial vernier caliper (with 0.01 mm accuracy) was used for the cast measurements. Length of the crown was measured from the highest point on the cervical line to the lowest point on the incisal edge. The cervico-incisal distance was divided into three equal parts. The junction of the incisal and middle one third was marked on the distal sides of right and left central incisors using fine lead pencil. It was done so because mesio-distal width of central incisors is thought to be maximum at distal contact areas at junction of mesial and incisal one thirds. Measurements were recorded using vernier calipers. In order to get maximum width two or more measurements were recorded one above and one below this level. The mesio-distal measurement was recorded at the widest dimension (contact area). Three measurements were taken per tooth and mean was calculated.

Method of collecting data

The measurements were obtained from the patient and also on the dentulous cast in mm, oon two separate occasion by one independent observer and average value was tabulated and analyzed statistically.

RESULTS

The present study was done to determine the correlation between combined mesio distal width of maxillary central incisors and mesio-distal width of base of the philtrum among Dakshina Kannada population.

Documentation of the data collected

The combined mesio-distal width of maxillary central incisors and the individual width each maxillary central incisor were measured in both the sexes. The mesio-distal width of base of the phltrum was also measured in both the sexes and the data was statistically analysed.

Reliability of the data

Table 1. Mean and standard deviation of the mesio-distal width of base of the philtrum

SEX	N	Mean	Std. Deviation	t
Male	35	13.641	1.174	3.557
Female	35	12.536	1.413	p<0.001 vhs

Table 2. Mean and standard deviation of the combined mesio-distal width of maxillary central incisors

SEX	N	Mean	Std. Deviation	t
Male	35	16.525	1.173	5.296
Female	35	14.981	1.264	p<0.001 vhs

There was highly significant correlation ($p<0.001$ & $r= 0.831$) between mean width of base of the philtrum and the combined width of maxillary central incisors in both the sexes

DISCUSSION

Many authors conducted a study, to find correlation between sum of mesio-distal width of maxillary central incisors and mesio-distal width of base of the philtrum, and they have drawn different conclusions. In present study, a highly significant correlation was found between the combined mesio-distal width of maxillary central incisors and mesio distal width of base of the philtrum among males and females in Dakshina Kannada population. There was a highly significant correlation between the mesio-distal width of right and left maxillary central incisors among males. There was a highly significant correlation between the mesio-distal width of right and left maxillary central incisors among females. So it can be stated that the maximum philtral width substracted by 5mm will provide the estimate for the width of maxillary central incisor among Dakshina Kannada population.

Conclusion

Within the limitations of this study, it can be concluded that:

1. There is correlation between the mesio-distal width of base of the philtrum to the combined mesio-distal width of maxillary central incisors among males which can be used as a guide for selecting the width of artificial maxillary central incisors among Dakshina Kannada, Karnataka population.
2. There is correlation between the mesio-distal width of base of the philtrum, to the combined mesio-distal width of maxillary central incisor among females so it can be used as a guide for selecting the width of artificial maxillary central incisors among Dakshina Kannada, Karnataka population.
3. The maximum philtral width substracted by 5mm will provide the actual mesio-distal width of single maxillary cetral incisor among males and females which can be used as a guide for selecting the width of artificial maxillary central incisors among Dakshina Kannada, Karnataka poplation.

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