CODEN [USA]: IAJPBB ISSN: 2349-7750

INDO AMERICAN JOURNAL OF
PHARMACEUTICAL SCIENCES

http://doi.org/10.5281/zenodo.3378238

Available online at: http://www.iajps.com *Research Article*

# A CROSS-SECTIONAL RESEARCH TO ASSESS THE ASSOCIATION VERTICAL FACIAL MORPHOLOGY AND INTER CANINE WIDTH

**[1]Dr. Sara Mariam, [2]Dr Raheela Sharif, [3]Dr Hira Noor**

[1]Govt. Gynae Hospital, UC 37, New Karol, Lahore, [2]Rural Health Center Halla Kasur, [3]Rural Health Center Chung Lahore.

**Article Received:** June 2019 **Accepted:** July 2019 **Published:** August 2019

**Abstract:**

***Background:*** *General perception prevails about the vital association between vertical facial morphology and arch width. The form and size of dental arches can pose serious orthodontic diagnosis implications for planning of treatment and orthodontic diagnosis.*

***Objective:*** *The aim of this research was to determine the correlation between vertical facial morphology and inter canine width among patients who were seeking orthodontic therapy.*

***Patients and Methods:*** *We conducted this cross-sectional study at Jinnah Hospital, Lahore from February to November 2018 on a total of one hundred patients. We obtained one hundred dental casts and lateral cephalometric radiographs and traced them as well. SN-MP angle was measured on lateral cephalography. Inter canine width was measured on dental casts. The correlation between SN-MP angle and Inter canine width shows significant P-Value of < 0.05.*

***Results:*** *The patients were selected in the age bracket of (12 – 38) years with an average age of (15.62 ± 4.97) years. Among one hundred patients there were 34 males and 66 females. The overall population presented a predominance of females over males. Mean SN-MP angle was (33.33 ± 5.28) with minimum and maximum angle of respectively 24 and 46 degrees. Low SN-MP angle was reported among 18 patients (Under 27 degrees), normal SN-MP angle was reported among 54 patients (28 – 36) degrees and high SN-MP angle was reported among 28 patients. Significant P-Value for SN-MP angle was (< 0.05). Inter canine width for lower SN-MP angle was (35 ± 2.47) mm, normal SN-MP angle was (33.73 ± 2.15) mm and higher SN-MP angle was (32.77 ± 3.21) mm. Mean inter canine width reduces with an increase in the SN-MP angle. Similarly, mean inter-canine width of mandible reduces with an increase in the SN-MP angle with mean values for low as (29.31 ± 3.54) mm, normal (26.97 ± 2.68) mm as and high as (25.39 ± 2.44) mm.*

***Conclusion:*** *The outcomes conclude that significant statistical association between vertical facial morphology and inter canine width exists.*

**Keywords:** *Vertical Facial Morphology, Arch Width, Maxilla, Mandible and Inter-Canine Width.*

**Corresponding author:**

**Dr. Sara Mariam,**

*Govt. Gynae Hospital, UC 37, New Karol, Lahore.*

QR code

*Please cite this article in press Sara Mariam et al.,* ***A Cross-Sectional Research to Assess the Association Vertical Facial Morphology and Inter Canine Width.,*** *Indo Am. J. P. Sci, 2019; 06(08).*

## INTRODUCTION:

Facial esthetics are mostly important in our societies which is of paramount importance in the field of dentistry. The objective of orthodontic treatment is to treat malocclusion along with the improvement in the facial esthetics profile. Various diagnostic parameters are thus important in the course of treatment planning.

Numerous cephalometric analyses are in use to establish the association between teeth and skeletal bases in the vertical and sagittal planes. Various factors determine the vertical facial pattern and SN-MP angle is one of those prime factors that contribute the most in the facial pattern [1 – 4]. Various determinants determine facial types such as lower and upper ratio of anterior facial height, formation of angle between skull and mandibular plane and gonial angle [5 – 8]. Higher SN-MP angle subjects have a longer face and vice versa [5, 9].

An author determined the association between vertical facial morphology and dental arch width [10]. Patients with longer face have narrow transverse dimensions and wider among those with short face. Dental arch dimension variations occur as an outcome of the treatment and growth which are important for the orthodontist that needs proper treatment planning. An enhanced understanding of these variations can also be good for the retention plans and treatment formulation at the end of clinicians [9 – 12]. General perception prevails about the vital association between vertical facial morphology and arch width. The form and size of dental arches can pose serious orthodontic diagnosis implications for planning of treatment and orthodontic diagnosis. The aim of this research was to determine the correlation between vertical facial morphology and inter canine width among patients who were seeking orthodontic therapy.

## METHODOLOGY:

We conducted this cross-sectional study at Jinnah Hospital, Lahore from February to November 2018 on a total of one hundred patients. We obtained one hundred dental casts and lateral cephalometric radiographs and traced them as well. SN-MP angle was measured on lateral cephalography. Inter canine width was measured on dental casts. In this research a total of 100 casts were obtained along with lateral cephalometric radiographs. Lateral cephalography was used for the measurement of SN-MP angle and we also measured inter canine width on dental casts. We included male or female patients who had a permanent dentition till the time of first permanent molar, no permanent extracted tooth and supernumerary tooth with no skeletal asymmetry. All those patients were not included in the research who had already received orthodontic treatment, unilateral posterior cross bites or bilateral cross bites.

Sample size was calculated with the help of PASS software. Total one hundred patients were documented for medical history and clinical assessment before commencement of the research. Casts were made after taking impression of the patients. Dental casts measurements were taken through Vernier calipers along with various other mandibular and maxillary measurements. Every patient was measured for SN-MP angle. SPSS software was used for outcomes analysis. Pearson's correlation was also made (r value -1.0 and +1.0). The correlation between SN-MP angle and Inter canine width shows significant P-Value of $< 0.05$.

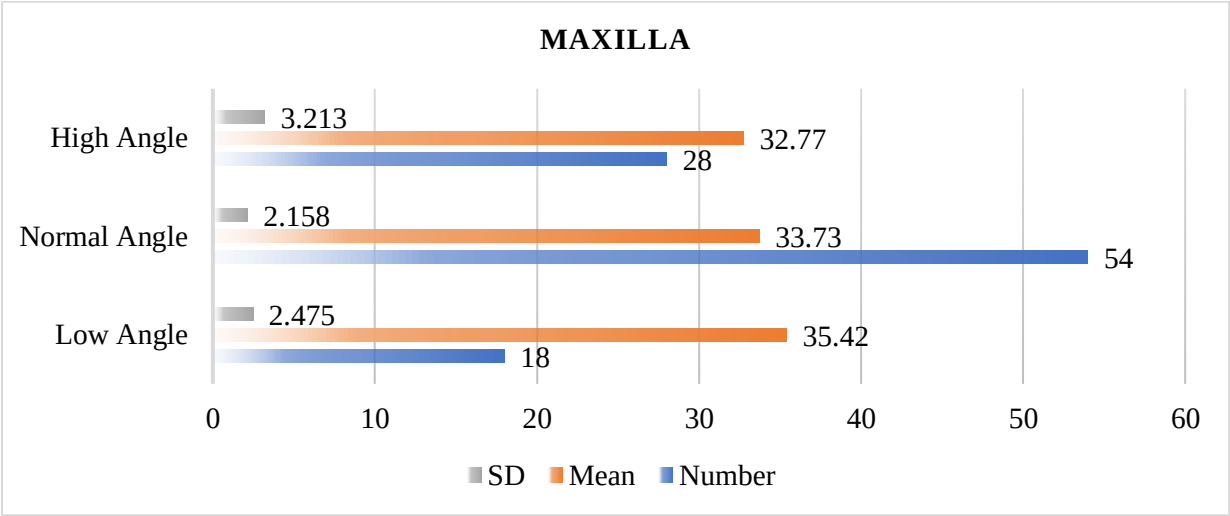
## RESULTS:

The patients were selected in the age bracket of (12 – 38) years with an average age of (15.62 ± 4.97) years. Among one hundred patients there were 34 males and 66 females. The overall population presented a predominance of females over males. Mean SN-MP angle was (33.33 ± 5.28) with minimum and maximum angle of respectively 24 and 46 degrees. Low SN-MP angle was reported among 18 patients (Under 27 degrees), normal SN-MP angle was reported among 54 patients (28 – 36) degrees and high SN-MP angle was reported among 28 patients. Significant P-Value for SN-MP angle was ($< 0.05$). Inter canine width for lower SN-MP angle was (35 ± 2.47) mm, normal SN-MP angle was (33.73 ± 2.15) mm and higher SN-MP angle was (32.77 ± 3.21) mm. Mean inter canine width reduces with an increase in the SN-MP angle.

Similarly, mean inter-canine width of mandible reduces with an increase in the SN-MP angle with mean values for low as (29.31 ± 3.54) mm, normal (26.97 ± 2.68) mm as and high as (25.39 ± 2.44) mm. Detailed outcomes of distribution of Maxilla and Mandible are presented with respect to SN-MP angle in Table – I. Table – II shows Inter Canine Width with respect to Maxilla and Mandible.

**Table – I:** Distribution of Maxilla and Mandible

| | SN-MP Angle Categories | Number | Mean | SD | P-Value |
|---|---|---|---|---|---|
| **MAXILLA** | Low Angle | 18 | 35.42 | 2.475 | 0.004 |
| | Normal Angle | 54 | 33.73 | 2.158 | |
| | High Angle | 28 | 32.77 | 3.213 | |
| **MANDIBLE** | **SN-MP Angle Categories** | **Number** | **Mean** | **SD** | **P-Value** |
| | Low Angle | 18 | 29.31 | 3.544 | 0.000 |
| | Normal Angle | 54 | 26.97 | 2.685 | |
| | High Angle | 28 | 25.39 | 2.447 | |



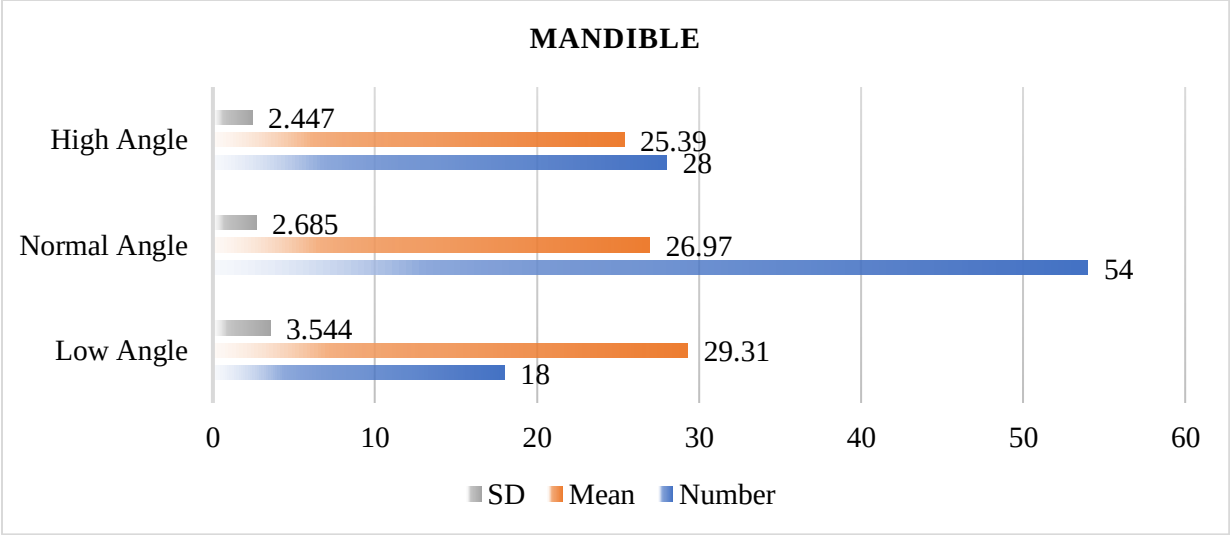



**Table – II:** Inter Canine Width (Maxilla Versus Mandible)

| | | |
|---|---|---|
| **MAXILLA** | **SN-MP Angle** | **Inter Canine Width (Maxilla)** |
| | Pearson Correlation | -0.226 |
| | Sig (2-Tailed) | 0.024 |
| | Number | 100 |
| **MANDIBLE** | **SN-MP Angle** | **Inter Canine Width (Maxilla)** |
| | Pearson Correlation | -0.431 |
| | Sig (2-Tailed) | 0.000 |
| | Number | 100 |

## DISCUSSION:

Vertical dysplasia correction is vital for the achievement of balanced profile after receiving orthodontic treatment. Female population dominated males in the research population. With respect to SN-MP angle distribution normal angled patients were more in number than other groups. The outcomes suggest that reduction in the mean inter-canine width is because of a vertical angle increase; therefore, it is recommended to use individualized arch forms for those patients who have variable vertical pattern. It is according to the basic stability requirements in which forbade to change the dimension of the arch across canines. We need to avoid arch expansion mechanics among the patients with an increased SN-MP angle or great care is to be maintained while using it. A cautious approach is recommended.

Few other authors also studied maxillary arch which showed a significant statistical inverse association between dental arch widths and mandibular plane angle. However, r value was small when measured suggesting a weaker correlation. Similarly, a weak and significant association between maxilla inter canine width and SN-MP angle was also present. Significant association between mandibular inter-canine width and mandibular plane angle was present for mandibular arch. Weak correlation was present due to smaller value of r as found in case of maxillary arch [5].

The outcomes presented by Forster CM, Chung and Sunga E about skeletal Class-I were not consistent with the outcomes of our research for all malocclusion groups as dental compensation is more in skeletal class II or III patients. This might also obscure the association between transverse dental arch widths and vertical facial morphology. Our research did not compare the variations of arch widths on the grounds of gender which have also been studied by various authors. Both genders were studies for mandibular arch and maxillary arch separately for significant differences [13 – 17]. Ideal untreated patients are difficult to find having ideal dentition without spacing or crowding. Finding an ideal untreated patient is a challenge for the selection of suitable research sample.

## CONCLUSION:

Increase in the AN-MP angle reduces inter-canine width for maxilla and mandible among both genders. The outcomes conclude that significant statistical association between vertical facial morphology and inter canine width exists.

## REFRENCES:


1. Changes in Arch Width a 20-year Longitudinal Study of Orthodontic Treatment Warda DE, Workmana J, Brownb R, Richmondc S. Angle Orthod 2006; 76: 6-13.
2. Bishara SE, Jakobsen JR, Treder J, Nowak A. Arch width changes from 6 weeks to 45 years of age. Am J Orthod Dentofacial Orthop 1997; 111: 401-09.
3. Björk A. Prediction of mandibular growth rotation. Angle Orthod 1969: 55: 585-99.
4. Howes A. Arch width in the premolar region — still the major problem in orthodontics. Am J Orthod. 1957; 43: 5-31.
5. Isaacson JR, Isaacson RJ, Speidel TM, Worms FW. Extreme variation in vertical facial growth and associated variation in skeletal and dental variations. Angle Orthod 1971; 41: 219-30.
6. Nasby JA, Isaacson RJ, Worms FW, Speidel TM. Orthodontic extractions and facial skeletal pattern. Angle Orthod 1972; 42: 116-22.
7. Schulhof RJ, Lestrel PE, Walters R, Schuler R. The mandibular dental arch: part III. Buccal expansion. Angle Orthod 1978; 48: 303-10.
8. Laraa MSV, Cariab PHF, Tosellob DO; Larac F; Mendonc M, Amorimd A. Electromyographic Activity of Masseter and Temporal Muscles with

Different Facial Types. Angle Orthod. 2009; 79: 515-20.
9. Ingervall B, Thilander B. Relation between facial morphology and activity of the masticatory muscles. J Oral Rehabil 1974; 1: 131-47.
10. Farella M, Michelotti A, Carbone G, Gallo LM, Palla S, Martina R. Habitual daily masseter activity of subjects with different vertical craniofacial morphology. Eur J Oral Sci 2005; 113: 380-85.
11. Kikuchi M, Higurashi N, Miyazaki S, Itasaka Y, Chiba S, Nezu H. Facial pattern categories of sleep breathing-disordered children using Ricketts analysis. Psychiatry and Clinical Neurosciences 2002; 56, 329-30.
12. Csiki I, Jianu R, Stratul SL, Vegh A. Are the Ricketts norms adequate for middle european adolescents? TMJ 2008, Vol. 58, No. 1-2.
13. Adams GL, Gansky SA, Miller AJ, Harrel WE, Hatcher DC. Comparison between traditional two-dimensional cephalometry and three – dimensional approach on human dry skull. Am J Orthod Dentofacial Orthop 2004; 126: 397-409.
14. Meistreli ME, Cangialosi TJ, Hudecz J. Columbia Analysis. In: Meistreli ME, Cangialosi TJ, Hudecz J. A guide to cephalometries. New York: Columbia University Orthodontic Division, School of Dental and Oral Surgery, 1990: 63-64.
15. McNamara JA. A method of cephalometric evaluation. Am J Orthod 1984; 86: 449-69.
16. McNamara JA. The cephalometric evaluation of the orthodontic patient. In: McNamara JA, Burdon WL. Orthodontic and Orthopedic treatment in the mixed dentition. Michigan: Needham Press Inc.1993; 13-14.
17. Forster CM, Sunga E, Chung CH. Relationship between dental arch width and vertical facial morphology in untreated adults. Eur J Orthod 2008; 30: 288-94.