

EVALUATION OF THE NASOLABIAL ANGLE OF KHYBER PAKHTUNKHWA SAMPLE

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ABSTRACT

Esthetic features are different from one race to another, and this should be considered during the treatment planning. The great variance in soft tissue drape of the human face complicates accurate assessment. The nose-lip-chin relationships are exceedingly important in determining the facial esthetics. One important soft tissue parameter in orthodontic diagnosis is the nasolabial angle. The purpose of this study was to establish norms for nasolabial angle in the local population.

Normative data for the nasolabial angle was produced from a sample of 50 (25 male and 25 female) adults (18-25 yrs) with well-balanced faces.

Mean and standard deviation values from this pooled sample demonstrated a nasolabial angle of $105.8^\circ \pm 3.95^\circ$.

No statistically significant difference was demonstrated between the values for men and women in this study, but men did have a slightly larger nasolabial angle.

Key Words: Cephalometric, nasolabial angle.

INTRODUCTION

Cephalometric analysis for orthodontic treatment planning has traditionally been based upon hard tissue relationships. However, modern orthodontics has shifted away from Angle's concept of ideal occlusion to place more emphasis on the soft tissues. The latter are of great importance, particularly when considering aesthetic and cosmetic outcome in orthognathic surgery. The few reported studies on soft tissue analysis using cephalometric radiographs have been limited to Caucasians and some other racial groups. Yet, establishing soft tissue profile norms in different populations is equally important, particularly as these values are known to differ between different racial groups.

Comprehensive orthodontic diagnosis and treatment includes facial harmony as a primary goal. Orthodontic treatment planning has evolved from considering

previously good occlusion toward the assessment of the soft tissue as well.

In orthodontics, various pretreatment soft tissue analyses have always been used to determine facial esthetics, thus offering an important tool to clinicians. A frequently used soft tissue parameter in orthodontic diagnosis is the nasolabial angle, which is formed by a line from lower border of the nose to the one representing the inclination of the upper lip. But the nasolabial angle alone is not always reliable because it has been drawn differently by various investigators and it is affected by the position of upper incisors and nose. For example, angular measurement of the patient may be within the normal range and yet there is presence of protrusion of the maxillary incisors and the upper lip. The reason for the normal nasolabial angle is an upturned nose. Such variations may lead to erroneous conclusions in orthodontic diagnosis.

It is therefore important to establish the normal nasolabial angle for this population. Thus, the purpose of this study was to determine and compare the naso-

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labial angles of the local population with Caucasian norms and also to establish any gender dimorphism if present.

The purpose of this study was to evaluate and compare the nasolabial angle of the local population with Caucasian norms.

METHODOLOGY

This study used the cephalometric radiographs of 50 adults between 18-25 years (25 men and 25 women), collected from the Department of Orthodontics, Khyber college of Dentistry, Peshawar Pakistan. The cephalograms were collected from the pretreatment records of patients who exhibited class I occlusion with good facial balance. All 28 permanent teeth were intact excluding the third molars. All cephalometric radiographs were traced on a transparent cellulose acetate sheet. For all the 40 samples, ANB angle was measured to confirm class I skeletal base, with the SNA angle between 80-85. Dental measurements were not included since all subjects used in this study presented with balanced faces.

Nasolabial angle evaluation

A three-step approach was used to draw the nasolabial angle. The most posterior point of the lower border of the nose at which it begins to turn inferiorly to merge with the philtrum of the upper lip was located and was called posterior columella point or PCm. A tangent was drawn from PCm anteriorly along the lower border of nose at its approximate middle third

and was called PCm tangent. The line drawn from PCm to labrale superius (Ls) was termed the PCm-Ls line. The anteroinferior angle formed by the intersection of PCm tangent and PCm-Ls line was the nasolabial angle.

To estimate the error of tracing, the location of landmarks and measurements, and thus the inherent deviation within the study, all the 50 cephalometric radiographs were traced by two orthodontists. The means and standard errors were calculated for the difference between the two recordings. The mean error was averaged less than 1.0° for the entire sample. For purposes of this study, the average of first and second measurements was used.

The mean standard deviation was determined from the standard deviation produced by the two examiners over the entire sample of 50 subjects.

Statistical analysis

The Statistical Package for Social Science (SPSS) software, Version 19 was used for data entry, editing and analysis. The measurements recorded from the sample of 50 cephalometric radiographs were tabulated. The mean and standard deviation were calculated to establish normative data.

RESULTS

The mean value of the nasolabial angle was $105.8^\circ \pm 3.95^\circ$, with men showing a value of $106.4^\circ \pm 3.90^\circ$ and women showing $105.24^\circ \pm 3.99^\circ$. This difference was found to be statistically insignificant.

CASE PROCESSING SUMMARY

	Cases					
	Included		Excluded		Total	
	N	Percent	N	Percent	N	Percent
nasolabial angle * Sex of the patient	50	100.0%	0	.0%	50	100.0%

REPORT: NASOLABIAL ANGLE

Sex of the patient	Mean	N	Std. Deviation
Male	106.40	25	3.905
Female	105.24	25	3.992
Total	105.82	50	3.952

REPORT: AGE OF THE PATIENT

Sex of the patient	Mean	N	Std. Deviation
Male	20.12	25	2.205
Female	20.72	25	2.574
Total	20.42	50	2.391

DISCUSSION

Beauty is an ill-defined concept that is obvious to observer and recognized cross-culturally. However, it is difficult to quantify and it may vary in its perception across different ethnic groups. To achieve high levels of patient satisfaction consistently after orthodontic treatment, the orthodontist must have an idea of appropriate esthetic norms. This has yet to be satisfactorily defined for all racial groups.

Many authors have emphasized on soft tissue evaluation before contemplating orthodontic or orthognathic treatment modalities in which nasolabial soft tissue is an important factor in determining the patients' facial esthetics. Consistent and reproducible methods of evaluating the nasolabial region are lacking. The nasolabial angle is formed by two lines, one from the nose and another from the upper lip, and both are independent of each other. The angular measurement described by these two lines is a resultant of their individual inclinations. The nasolabial angle of a person may be within normal range, small, or large. The measurement of this angle alone provides inadequate information as it does not reveal which component is responsible for the variability. It could be the nose, the lip, or both. Therefore, it is important to analyze each component of this angle to assist in the differential diagnosis of normal from its variation.

The proposed method of locating the posterior columella point onto which a tangent was drawn to the lower border of the nose, as well as the line from this point to labrale superius proved to be a reliable technique for constructing the nasolabial angle.

This study provides a useful platform for comparing cephalometric nasolabial angles among adults (18-25 yrs) in the local KPK population. It has also been interesting to compare these values with those previously reported for Caucasian subjects. This study provides a useful guide for orthodontists in the diagnosis, treatment planning and management of orthodontic patients from the local population.

The results of the present study indicate that the nasolabial angles of the local population are slightly more than the Caucasian norms for both males and females. The mean value of the nasolabial angle in this sample was almost similar to the one reported

by McNamara *et al.* It also correlates with the values reported by Nanda *et al.* Owen *et al.* have reported a similar nasolabial angle value of $105^\circ \pm 8^\circ$, when compared with the results of this study..

Much research demonstrates that soft tissues, which vary considerably in thickness, are a major factor in determining a patient's profile. The soft tissues of the face are independent of the thickness and size of the underlying facial skeleton, and thus greater emphasis needs to be placed on their evaluation in formulating treatment plans for dentofacial disharmonies.

CONCLUSION

A cephalometric study of 50 subjects from the local population (25 men and 25 women) with class I occlusions and good facial balance was conducted. Standardized lateral cephalograms were taken in natural head position. All cephalograms were traced and the nasolabial angle was evaluated as proposed by McNamara *et al.* $21 (102 \pm 8^\circ)$.

The results show that the mean nasolabial angle was $105.8^\circ \pm 3.95$. The mean nasolabial angle for men was slightly higher than the female group by 1.16° , which was statistically insignificant.

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