

NASAL TIP PROJECTION ESTIMATED BY HOLDAWAY ANALYSIS IN ORTHODONTIC PATIENTS VISITING REHMAN COLLEGE OF DENTISTRY

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ABSTRACT

Objective: The purpose of this study was to obtain population specific values for quality orthodontic and orthognathic treatment planning.

Material and Methods: The cross sectional descriptive study was conducted on the lateral cephalometric X-rays of 100 patients (50 males and 50 females) visiting the orthodontic department of Rehman College of Dentistry, Pakistan from 1st June 2016 to 1st January 2017. Nasal lengths according to Holdaway analysis was assessed on the lateral cephalometric X-rays and the results analysed.

Results: The calculated average nasal length for males was 15 ± 4.8 mm and for females was 13 ± 2.4 mm. The sexual dimorphism for nasal length was non-significant.

Conclusions: The average value of nasal length for males was within normal range while that for the females was less than the Holdaway norms (14-24mm).

Key words: Holdaway analysis, Nasal tip projection, lateral cephalometric X-ray, soft tissue cephalometrics

INTRODUCTION

Nose and midface is very important for an individual's appearance and facial aesthetics¹. Nasal growth spurt completes in girls at the age of approximately 16 and in boys at the age of approximately 18 years while this growth continues into the adult age at a slow pace. Studies being carried out in this decade have put the concept of "divine proportion" into question by putting forth race and gender specific soft tissue cephalometric norms² and proving that the standards of beauty changes from region to region. The nose shape has been classified according to regions with blacks having platyrrhine, Oriental's mesorrhine and whites having leptorrhine shaped noses³. The norms of nasal parameters can be used as a standard for comparing treatment outcomes, treatment planning in orthodontics and in nasal surgeries⁴. Aesthetic nasal

surgery is becoming very common and nowadays^{5,6}. Nasal norms can be measured by direct clinical measurement (morphometric), lateral cephalograms⁷, 2D⁸ and 3D⁶ photographs, 3D white light scanners⁹ and 3D laser scans¹⁰.

The rationale of performing this study is to have population specific values of nasal length which could assist us in orthodontic and orthognathic treatment planning. Also it will provide us a comparison of values of nasal projection among male and female patients of the sample.

METHODS AND MATERIALS

The cross sectional descriptive study was conducted on patients visiting the orthodontic department of Rehman College of Dentistry, Pakistan. Ethical approval was obtained from the hospital and every patient's confidentiality was assured. The duration of the study was 7 months from 1st June 2016 to 1st January 2017. A sample was selected using convenient sampling which consisted of 50 males and 50 females.

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All the lateral cephalograms were obtained in natural head posture, with Kodak 8000C, were of high quality and sharpness. The age of the patients range between 18 years to 28 years. Each cephalogram was traced and analysed by two orthodontists at different occasions. The tracings were carried out with a 2H lead pencil on an acetate paper. The nasal length was measured according to the technique described by Holdaway¹¹. The nose prominence was described as the distance from a line perpendicular to Frankfort horizontal and running tangent to the vermilion border of the upper lip, to the tip of the nose¹² as shown in Figure 1.

All the subjects included in the study were of Pakistani origin with class I skeletal and dental relationship with all teeth present (except the third molars). Cases with anomalies e.g. syndromes, trauma, surgery, scars etc. were excluded. Data was analysed by SPSS version 18 using confidence level of 95% and probability of chance 5%.

RESULTS

The nasal lengths of male and female patients visiting Rehman College of Dentistry were 15 ± 4.8 mm and 13 ± 2.4 mm respectively (Table 1). Statistically no significant difference (p<0.05) was noticed in nasal lengths between both genders as shown in Table 2.

DISCUSSION

The aim of the routine orthodontic treatment is to improve the facial aesthetics of the patients¹³. Albrecht Durer maintained that disproportionate faces are un aesthetic and proportionate faces are acceptable¹⁴. According to studies the growth of nose is in a downward and forward direction with increase in

length of 1.5mm every year during adolescence¹⁵. It has been confirmed that hard tissues i.e. nasal bones and cartilages determine the shape of the nose¹⁶. Like all other parts of the face nasal features are characteristic of every individual and region¹⁷.

Patients with vertical maxillary excess have increased nasal lengths¹⁸. According to a study by de Assiss et al noses became more prominent (un aesthetic) in patients who underwent maxillary first premolar extraction in skeletally class II cases and in those who already had lengthy noses in the beginning of treatment. Nasal length decreased from 18.2 mm (SD = 3.5) to 16.5 mm (SD = 3.3) in skeletally class III patients who underwent both Le Fort class 1 and bilateral sagittal split osteotomy¹⁹.

The nasal lengths of males and females measured in the Burlington growth study were 15mm and 14mm respectively²⁰. In India the Lambada population in Telangana region of Andhra Pradesh males had non prominent noses with lengths of 3.9mm ± 1.2 and females exhibited lengths of 3.8mm ± 0.99²¹. The Palestinian population exhibited length of 19.24mm ± 3.01²². In Turkey males have nasal lengths of 15.3mm ± 3.4 and females displayed 15.3mm ± 2.8²³. Persian males and females had nasal lengths of 18.91mm ± 2.97 and 14.91mm ± 2.90 respectively²⁴. The mean value obtained from our study for males (15mm ±

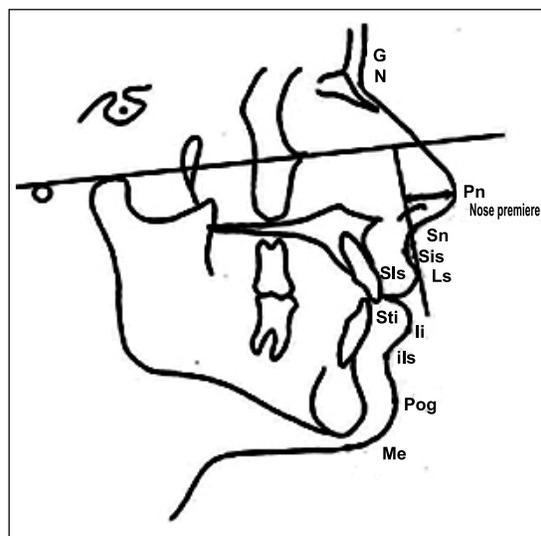


Figure-1:

Table-1:

Gender	Mean length	N	Std. Deviation	Std. Error Mean
Male	15.1200	100	4.76375	.95275
Female	13.0400	100	2.42350	.48470

Table-2: Paired Samples Test

	Paired Differences				t	df	Sig. (2-tailed)	
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower				Upper
Male - Female	2.08000	5.75123	1.15025	-.29399	4.45399	1.808	99	.083

4.8) was within the range of Holdaway norms (14–24 mm)¹¹ while that of females (13mm + 2.4) was less than the Holdaway norms. Though the mean nasal lengths of males and females obtained from our study were close to Turkish and Persian population.

The main limitation of this Holdaway value for nasal lengths is that it is influenced by the soft tissue point labrale superioris which is influenced immensely by the facio palatal inclination of the maxillary teeth hence we should also cross check with other cephalometric values for measuring the length of the nose which are not influenced by the position of dentition.

Lastly our study emphasized the importance of considering nasal lengths in planning cases of potential orthodontic and orthognathic patients.

CONCLUSION

- The average value for nasal lengths of males was within normal range while that of females was less than Holdaway's norms.
- In comparison of the sexes, difference of nasal lengths was not statistically significant.

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