



Research Paper

Nasolabial Angle of the IJAWS: A South-South Nigerian Study

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ABSTRACT

Nasolabial angle is a useful biomarker for orthodontic surgery. This study was to enumerate and establish normative for Nasal Height, Nasal Breadth and Nasolabial Angle of Ijaws in the South-South Nigeria. Nasal height was measured as the distance from the nasion to the pronasale. The nasal breadth is the distance between the two alae. This nasolabial angle was constructed from the base of the nose through the philtrum to the most superior tip of the upper lip [lower landmark] and from the same baseline point through the columella to the tip of the nose [upper landmark] and a goniometer was used to measure this angle. Measurements were taken in 500 respondents free from any facial deformity. The results showed mean value of nasal length of the Ijaw males as 44.40 ± 0.70 mm and the female as 42.10 ± 0.75 mm. There is statistically significant difference in their mean ($p < 0.05$). The mean value of nasal breadth of the Ijaw males is 46.55 ± 1.05 mm and the females 42.85 ± 0.66 mm. There is statistically significant difference in their mean ($p < 0.05$). The nasolabial angle of the Ijaw males is $59.50^\circ \pm 2.50$ and $60.78^\circ \pm 2.20$ for females. The results indicate no significant difference in their mean ($p > 0.05$). In preparations for orthodontic procedures, patients' treatment plans, novel aesthetics techniques, surgeons and health expertise should carefully consider sexual dimorphism, racial and ethnic variability because there is no uniform or generalized normative in anatomical parameters.

Key words: Nasolabial angle, Sexual Dimorphism, Nasal height, Nasal breadth.

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I. INTRODUCTION

Nasolabial angle is an angle between the line drawn through the midpoint of the nostril aperture and a line drawn perpendicular to the Frankfurt horizontal while intersecting subnasale [1]. A study was conducted by [2] for the constructing a nasolabial angle that would also permit an evaluation of the relative inclination of the lower border of the nose and the upper lip, as well as their relationship to each other. Result showed no statistically significant difference between the values for men and women; but the women did have a slightly larger nasolabial angle. A linear comparison of the three nasolabial parameters with six skeletal measurements revealed no significant relationship between the soft tissue profile of the nasolabial region and the underlying skeletal relationships. There are three types of nasolabial angles: straight, acute and obtuse. An arbitrary range of 90 to 120 degrees is stated as the ideal nasolabial angle. When the nasolabial angle is over 130 degrees, the nasolabial angle is described as obtuse nasolabial angle, while an angle of 90 degrees or less is described as an acute nasolabial angle [2]. A radiographic cephalometric study of nasolabial angle was conducted in 45 Indian origin. The method of evaluation was according to the criteria given by [2], gave norms for Caucasian population. Significant decrease in nasolabial angle values was observed in Indian population. The mean value of the nasolabial angle was $96.1^\circ \pm 9.7^\circ$, with males at $96.74^\circ \pm 10.89^\circ$ and females at $95.64^\circ \pm 8.9^\circ$ [3]. A study to establish black norms that will be valuable aids for diagnosis in such cases. Lateral cephalometric radiographs were taken of 50 white adults (25 male, 25 female) and 50 black North American adults (25 male, 25 female). Significant differences between white and black subjects were found in the following areas: hard tissue (SNA, ANB, mandibular length, and the Wits analysis); dental (anterior dental height [ADH], amount of tooth exposure at rest, upper incisor-palatal plane [UI-PP], and lower incisor-mandibular plane [LI-MP]); and soft tissue (nasolabial angle [NLA], upper lip length [ULL], lower lip length [LLL], throat length [TL], and the lip-chin-throat angle [LCTA]). From a practical point of view, this study can be used by orthodontists and oral

surgeons to aid in the diagnosis of black patients contemplating orthognathic surgery [4]. Facial plastic surgeons must understand nasal aesthetics in the context of race, ethnicity, and culture [5]. Despite the substantial amount of research devoted to objectively defining facial attractiveness, the canons have remained a paradigm of aesthetic facial analysis, yet their omnipresence in clinical assessments revealed their limitations outside of a subset of North American Caucasians, leading to criticism about their validity as a standard of facial beauty. As in the attractive face, the concept of the ideal nasal anatomy varies between different ethnicities [6]. Using objective criteria and proportions of beauty to plan and execute rhinoplasty in different ethnicities can help the surgeon plan and deliver results that are in harmony with patients' individual background and facial anatomy [6]. Rhinoplasty is considered to be one of the most challenging procedures in otolaryngology head and neck surgery. Meticulous planning and excellent surgical skills are pre-requisites for reproducible good outcomes [7]. Gaining surgical consistency in patients of African descent has proven to be elusive and unpredictable for many rhinoplasty surgeons. Surgical success relies on the surgeon's ability precisely to identify anatomic variables and reconcile these anatomic realities with the patient's expectations for aesthetic improvement and ethnic identity [8]. Across ethnicities, patients seeking rhinoplasty have similar goals—a natural looking nose that fits and complements the rest of their facial features. Beyond a harmonious nose, patients of African descent have a particularly strong desire for ethnically congruent results in spite of individual aesthetic rhinoplasty preferences. This strong appeal for ethnically sensitive alterations is fueled by the desire to maintain physical identification with one's African ethnicity [9]. Defining the ideal dimensions and proportions of the human face has been attempted for centuries, popularized in the Renaissance period by artists including Leonardo Da Vinci. The lips are part of the lower third of the face and are central to lower face aesthetics and the overall symmetry of the face [10]. The appearance of the lips in part determines the attractiveness of a person's face. In females, fuller lips in relation to facial width as well as greater vermilion height are considered to be attractive [11]. The projection and relative sizes of the upper and lower lips are as significant to lip aesthetics as the proportion of the lips to the rest of the facial structure. Robust, pouty lips are considered to be sexually attractive by both males and females [11]. Perception of beauty is influenced by the individual's demographic background and characteristics. However, objective measurements and ratios remain the foundation for aesthetic evaluations. Age, gender, country of residence, and profession significantly impact individual upper to lower lip ratio preferences. However, a 1.0:1.0 lip ratio can apparently be considered most pleasing in females [12]. Horizontal thirds and the golden ratio describe the proportions that contribute to the beauty and attractiveness of the lips. In young Caucasians, the ideal ratio of the vertical height of the upper lip to that of the lower lip is 1:1.6. Blacks, genetically, have a greater lip volume. The shape and volume of a person's lips are of great importance in the perception of beauty by humans. The appearance of the lips in part determines the attractiveness of a person's face. Nasal tip surgery has become significantly more complex since the introduction of tip grafting and the many suture designs that followed the resurgence of open rhinoplasty. Independent of the surgeon's technical approach, however, is the need to identify the critical anatomical characteristics that will make nasal tip surgery successful. It is the author's contention that only two such features require mandatory preoperative identification: (1) whether the tip is adequately projecting and (2) whether the alar cartilage lateral crura are orthotopic or cephalically rotated ("malpositioned") [13]

II. MATERIALS AND METHODS

Somatometric measurement was carried out on Nasal Height, Width and Nasolabial Angle of 500 Ijaw respondents. Nasal height was measured as the distance from the nasion to the pronasale. The nasal width is the distance between the two alae.

Nasolabial angle was measured between the lower border of the nose tip [columella point] and the most superior tip of the upper lip, as anatomical landmarks used by [Fitzgerland et al. 1992]. A digital caliper was used to measure these two landmarks which was then placed in a plane sheet of paper. The two points were marked and an angle was created between them. A goniometer was used to measure the angle [nasolabial].



Fig 1: Digital Caliper

Inclusion criteria;

1. All subjected were between the ages of 18-45 years
2. All subjects were free from facial deformity and surgery.
3. Measurements were taken with the lips relaxed
4. All linear measurements were in millimeters.
5. Angular measurements were taken in degree
6. All subjects were Ijaws

Exclusion criteria.

1. Any subject that do not meet the inclusive criteria were excluded.

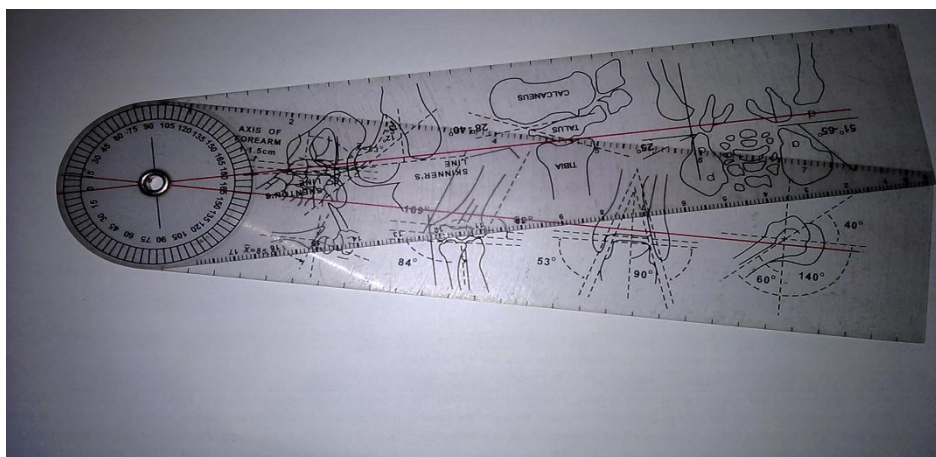


Fig 2: A Goniometer

Data Analysis

The data collected from the measurements were analyzed statistically using Statistical Package for Social Science (SPSS) 22.0 version. The Mean, Standard Deviation, Standard Error, Z- Test were used to analyze data. P- value less than (0.05) was considered as significant.

Ethical Consideration

Verbal informed consent was sought from willing participants before the commencement of the measurement procedure. They were enlightened on the research purpose.

III. RESULTS

TABLE 1: MEAN VALUE OF NASAL PARAMETERS

S/N	PARAMETER	MALE	FEMALE
1	NOSE HEIGHT [mm]	44.40±0.70	42.10±0.75
2	NOSE WIDTH [mm]	46.55±1.05	42.85±0.66
3	NASOLABIAL ANGLE [degree]	59.5±2.50	60.78±2.20

All value are in Mean±SEM

The mean value of nasal length of the Ijaw males is 44.40±0.70 and the female value is 42.10±0.75. There is statistically significant difference in their mean (p<0.05).

The mean value of nasal breadth of the Ijaw males is 46.55±1.05 and the female value is 42.85±0.66. There is statistically significant difference in their mean (p<0.05).

The mean Nasolabial angle of the Ijaw males is 59.5±2.50 and 60.78±2.20 for female. The results indicates no significant difference in their mean (p>0.05).

TABLE 2: TEST FOR SIGNIFICANCE

S/N	PARAMETER	MALE	FEMALE	z- value	Z-CRIT	INFERENCE
1	NOSE HEIGHT	44.40±0.70	42.10±0.75	2.24	1.69	SIGNIFICANT P≤0.05
2	NOSE BREADTH	46.55±1.05	42.85±0.66	2.99	1.69	SIGNIFICANT P≤0.05
3	NASOLABIAL ANGLE	59.5±2.50	60.78±2.20	-0.38	1.69	NOT SIGNIFICANT P≥0.05

TABLE 4: COMPARISON PRESENT AND PREVIOUS VALUES OF NASOLABIAL ANGLE

S/N	RESEARCHER	RACE	MALE	FEMALE
1	Fitzgerla et al, 1992	Caucasians	113.55°±9.44	116.19°±1.0
			114°±10.0	
2	Vinay et al., 2010	Indians	96.70°±10.89	95.64°±8.90
			96.10°±9.7	
3	Connor and Moshiri. 1985	Brazilian Blacks	88.14°±12.52	
4	Present study	Ijaws [Nigerians]	59.5±2.50	60.78±2.20
			60.14°±2.35	

IV. DISCUSSION

The human beauty and attractiveness is mostly centered on the facial components especially the anatomical architecture of the nostril and lips. It has been stated by [Vinay2010] that nasolabial angle is one frequently used soft tissue parameter in orthodontic diagnosis. The results from this present study have shown that there is sexual dimorphism in the Ijaw male and females nose width and length, were the males possess wider nose and nasal length than the their female counterparts. The results showed no sexual difference in nasolabial angle between the Ijaw males and females of South-South Nigerian population. Comparison of the nasolabial angle of the Ijaws and other races, and tribes had shown variability [table 4]. The nasolabial angle of the Caucasian as presented by Fitzgerla et al, 1992 is average 114°±10.0 which is far higher than the Ijaws in Nigeria having a value of 60.14° ±2.35 . The Indians possess a nasolabial angle of 96.10°±9.7 according to Vinay et al., 2010 is higher than the value from the Ijaws. There is also significant difference of the nasolabial angle of the Brazilian Blacks with a value of 88.14° ±12.52 and the Ijaws. It has been stated in literature that the nasolabial angle could be acute [90°] or obtuse [above 130°]. The Ijaws, both males and females possess nasolabial angle less than 90°

V. CONCLUSION

In preparations for orthodontic procedures, patients treatment plans, novel aesthetics techniques surgeons and health expertise should carefully consider sexual dimorphism, racial and ethnic variability because there is no uniform or generalized value for anatomical parameters in the world. This is based on this variation in the anatomy of humans in various geographical locations.

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