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LENGTH TO WIDTH RATIO OF THE LIPS OF ADULT ORON POPULATION OF AKWA IBOM STATE OF NIGERIA

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ABSTRACT
Anatomy and facial dimensions are handy to surgeons carrying out repair and reconstruction of facial deformities to maintain optimal relationships among facial structures. The aim of the study was to determine the length to width ratio of adult male and female lips in Oron people of Akwa Ibom State of Nigeria to ascertain what describes a normal lip dimension for the Oron people. Lip size (length and width) was measured in a total number of one thousand (1000) apparently healthy subjects divided into 500 males and 500 females who were randomly selected. The subjects were healthy adults aged between 18 – 45 years without any lip injury or known history of lip surgery. Measurement was taken using a digital Vernier caliper with precision of 0.1mm. Data obtained was subjected to statistical analysis and results were presented in tables. Result showed that mean lip length for the males was 52.26±0.16mm and width 24.06±0.13mm while the lip length for the females was 52.70±0.15mm and width_24.29±0.13mm. Mean lip length to width ratio of the males was 2.20±0.25 and that of the females was 2.20±0.27. Our finding leaves the ratio of length to width measurement of adult male and female lips in Oron at 1:1. Though the mean male value was higher than that of the females, no statistically significant difference was observed. It is therefore not sexual dimorphic. This study could be useful in maxillofacial surgery and anthropological studies.

KEYWORDS: Lips, length, width, ratio, Oron.

INTRODUCTION
Oron is one of the local government areas of Akwa Ibom State whose headquarters is in the town of Oron. It has an area of 64km2. The Oron nation is the third largest ethnic group in Akwa Ibom State. Oro people are mostly farmers, traders and fisher men.[1]

Facial form is a modest method used to distinguish between people.[2] Studies involving measurements of nose as well as lip proportions are subdivisions of anthropometry.[3,4,5] Anatomy and structures of facial dimensions are useful criteria for surgeons carrying out reconstruction of facial deformities and repair to ensure maintenance of optimal relationships among facial structures.[4,6,7] Adequate understanding of the relationships amongst structures of face allows for proper diagnosis and treatment of individuals.[8]

Furthermore, before administering orthodontic treatment, assessment of soft tissues such as lips at rest and during function should at all times before be done by clinical evaluation as the morphology of the soft tissues is a key factor in determining overall profile of the face.[9]

Physical appearance of an individual is one of the main characteristics of the face; though, the definition of an attractive and pleasing face is subjective, with many factors involved such as culture, personality, ethnic background and age.[10]

Aging and sex particularly have an impact on the lips, with changes in thickness, and in vermilion dimensions, coupled with the distance between the nose and the upper lip vermilion border, and in mouth width.[11,12] Lips have also been shown to play a significant role in breathing mode, craniofacial morphology[13,14,15,16,17] malocclusion and muscle functions.[15,18] Changes in lip morphology are observed in various ethnic groups and races. In the light of this therefore, this study becomes necessary.

MATERIALS AND METHODS

Sampling

Study design was cross-sectional which made use of 1000 adult subjects randomly selected from Oron in Akwa Ibom State, Nigeria. Subjects were aged between 18-45 years. Informed consent was obtained from all participants.

Measurement

Digital Vernier caliper was used to extract measurements as follows.

Upper lip length; the measured distance from the subnasal (Sn) to the stomion (St).

Lower lip length: the distance measured from the stomion (St) to the gnathion (Gn).

Lip length: Upper lip length (A) + Lower lip length (B)

Lip width: measured distance from right chelion (C) to left chelion (D).

Therefore;

AB - The length

CD = Width

Ratio = AB/CD or length/width

Precaution

1. Anthropometric data and other biosocial information were collected by the researchers to avoid inter-observer variability.
2. To minimize error, each measurement was taken three times and the mean recorded.
3. Measurements were taken to the nearest 0.1 millimeter (mm).

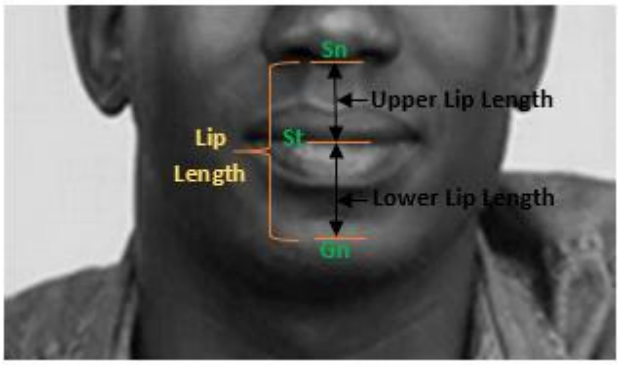

Figure 1: Upper and lower lip lengths; Sn – subnasal, St – stomion, Gn – gnathion.

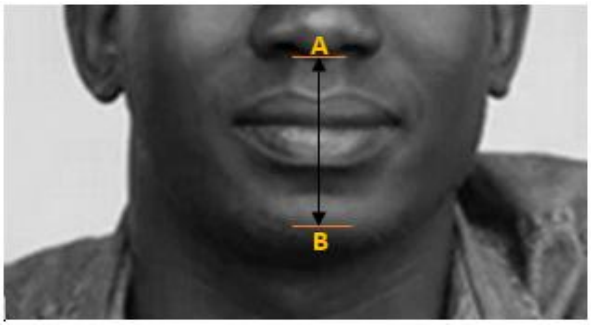

Figure 2: Lip length; A – subnasal, B – gnathion.

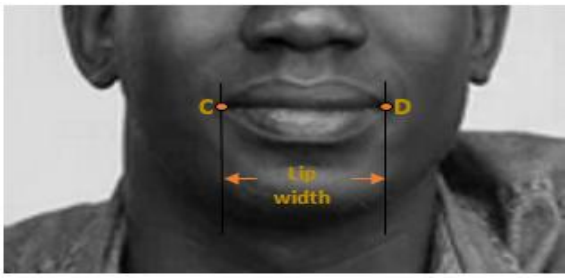

Figure 3: Lip width; right chelion (C) to left chelion (D).

Inclusion criteria

1. Only individuals aged between 18 to 45 years were used for the study.
2. Subjects were with no history of craniofacial trauma or surgery
3. Individuals were of Oron ethnic group and without mixed parentage.
4. Individuals had no congenital anomalies

Exclusion criteria

1. Those with history of lip surgery or trauma
2. Craniofacial syndromes
3. Individuals with mixed parentage.
4. Those outside the age bracket of 18 – 45 years

Statistical analysis

Statistics was done using the Statistical Package for Social Sciences (SPSS, Version 24.0). Continuous variables were presented as mean±SD. Age was grouped into four: 18-25, 26-33, 34-41 and >42). z-test was done to determine significant difference in the measured anthropometric variables between sexes. Analysis of variance was done to determine significant difference in the studied parameters across age groups. Confidence interval was set at 95%; $p< 0.05$ was thus considered significant.

RESULTS

Descriptive statistics of all subjects as well as those of male and female subjects, and age groups are presented below (Tables 1 – 8). Mean lip length to width ratio increased progressively with age in both sexes. ANOVA showed significant difference ($p<0.05$) in age groups 18 – 25, 26 – 33 and 34 – 41 whereas no statistically significant difference ($p>0.05$) was observed in age group >42 in both sexes (Tables 4 and 5). Mean lip length value was higher in females than in males, and when compared using z statistic, a significant difference was observed ($p<0.05$) whereas lip width and lip length to width ratio were higher in males but the difference was not statistically significant ($p>0.05$) (Tables 6 – 8).

Table 1: Descriptive statistics of anthropometric variables of all subjects (mm).

Variable	Mean±SD	Variance	Range
Age	25.96±5.63	31.78	18 – 45
Length	52.48±3.49	12.12	42.11 – 59.49
Width	24.18±2.84	8.07	17.75 – 33.09
Ratio	2.20±0.26	0.07	1.61 – 3.14

Table 2: Descriptive statistics of anthropometric variables for male subjects (mm).

Variable	Mean±SD	Variance	Range
Age	25.54±5.41	29.31	18.00 - 45.00
Length	52.26±3.52	12.36	42.11 - 59.48
Width	24.46±2.81	7.88	17.75 - 33.10
Ratio	2.12±0.25	0.06	1.61 - 3.14

Table 3: Descriptive statistics of anthropometric variables for female subjects (mm).

Variable	Mean±SD	Variance	Range
Age	26.37±5.85	34.24	18.00 - 45.00
Length	52.70±3.45	11.88	42.10 - 59.49
Width	24.29±2.87	8.25	17.75 - 33.09
Ratio	2.20±0.27	0.07	1.61 - 3.14

Table 4: Mean length to width ratio in different age groups among male subjects.

Age group	Mean±SD	p-value	Inference
18-25	2.16±0.26	0.04	S
26-33	2.24±0.25	0.06	S
34 – 41	2.26±0.32	0.03	S
>42	2.29±0.32	0.10	NS

Table 5: Mean length to width ratio in different age groups among female subjects.

Age group	Mean±SD	p-value	Inference
18-25	2.19±0.25	0.06	S
26-33	2.20±0.25	0.03	S
34-41	2.22±0.24	0.06	S
>42	2.24±0.21	0.04	NS

Table 6: z-test for lip length in both sexes.

Sex	Mean	Variance	z-test			
			z-cal	z-critical	p-value	Inference
Female	52.70	11.88	1.97	1.96	0.04	S
Male	52.27	12.36				

S – significant.

Table 7: z-test for lip width in both sexes.

Sex	Mean	Variance	z-test			
			z-cal	z-critical	p-value	Inference
Female	24.29	8.25	1.24	1.96	0.22	NS
Male	24.46	7.88				

NS – not significant

Table 8: z-test ratio of total male and female.

Sex	Mean	Variance	z-test			
			z-cal	z-critical	p-value	Inference
Female	2.20	0.07	0.065	1.96	0.10	NS
Male	2.40	0.06				

NS – not significant

DISCUSSION

This study investigated normal lip length to width ration in adult individuals of Oron ethnic group, Akwa Ibom State, Nigeria. It establishes normative values of the various studied lip parameters for what describes the normal lip of Oron people. Age related changes were observed as lip length to width ratio increased progressively with age in both sexes. This could be attributed to the fact that morphological and body structural changes in humans occur throughout life. In the human body, many physical changes are observed at every stage of life, although each individual experiences a distinct pattern of growth and development.[19] Physical dimensions are at peak from age 20 to 35 years.[20] In certain age groups in the present study such as 18 – 25, 26 – 33 and 34 – 41, significant difference ($p<0.05$) was observed in both sexes reinforcing the assertion of Mahima et al.[20] whereas in age group >42, the difference was not statistically significant ($p>0.05$) in both sexes. Mean lip length value was significantly higher ($p<0.05$) in females than in males, while lip width and lip length to width ratio were higher in males but the difference was not statistically significant ($p>0.05$). This implies that lip to width ratio in the Oron population is not sexually dimorphic. Previous studies have documented the morphological variation in several different races.[21,22,23,24] On comparison with those of other populations, the mean lip height value from the present study was higher than that reported by Sforza et al.[11] in Italy. The Caucasian race indicated a smaller lip height. Similarly, mean lip width in our study was higher than that that of the Italians.[11] Dearth of literature on lip length to width ratio could not make for adequate ethnic and racial comparisons.

CONCLUSION

Successful post-operative outcomes in facial surgery requires a comprehensive and accurate preoperative planning, and this can be aided by normative anthropometric data describing a particular population. The findings of this study could therefore aid reconstructive and maxillofacial surgeries as well as find use in anthropological and medical studies.

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