Anthropomorphic Assessment Of Philtrum

Dr. Preeti Singh[1*]

[1*]Head, Department of Anthropology, National P.G. College Lucknow, Uttar Pradesh. (An Autonomous, NAAC 'A' Accredited & CPE, College of Lucknow University, India). Email: - preetisinghtomar@yahoo.com

Abstract
Six hundred normal individuals (females) of different age groups from Lucknow (India), belonging to Rajput(R) & Brahmin (B) community were included in this study. Various dimensions of philtrum, lips and mouth were measured. The results were compared with the available data for Nepalese, Malays and Indonesian Adults. In the population under study the philtrum, lips and mouth measurements differ in all dimensions with all the compared populations and show no resemblance to the any. The analysis of the data does not simply indicate the differences in the measurements throughout the world, but also points out changes which may have a forensic and clinical significance.

Keywords: - Anthropometry, Philtrum, Lips, Females.

Introduction

Anthropometry is a means of qualifying variations in body size and shape. It is one of the most fundamental techniques of physical anthropology, representing the typical and traditional tool of physical anthropologists. Anthropometric measurements in India were first systematically taken by Sir Herbert Risley and were published as a volume of Ethnographic Appendices of Census Report of India 1891 (Majumdar, 1949). Phenotypic variations are the essence of morphological variability, which are determined by genes located on the chromosomes and also, most of our somatic variations are polygenically controlled.

Apart from the other general characters like head length, head breadth etc., there is another attribute in the face that affects the profile of the face.

In the middle of the external surface of the upper lip is a shallow groove – *philtrum*. It ends below in a slight prominence (tubercle) and is limited in each side by a ridge (Gray 1958). The integumental upper lip in man shows a central furrow- the philtrum, a characteristic feature that distinguishes man from other anthropoids, running down from the nasal septum to the edge of the membranous upper lip, the boundary of which is elevated at the edges of the furrow. Philtrum, is a character that distinguishes man from anthropoids, running down from the nasal septum to the edge of the membranous lip; the boundary of which is elevated at the edge of the furrow. Thus, this is peculiar to man and gives him his characteristic upper-lip profile (Hooton: 1931). The study of philtrum is not known to the extent, that may be concluded into a concrete hypothesis. This characteristic feature of cephalometry and oral habits play an important role in deciding the cranial form and ultimately affect the cephalo-facial structure. The role of orbicularis oris muscle is dynamic in giving rise to the unique configuration of the philtrum (Lee:1988). The existence of philtral contours exerts a significant impact on perioral attractiveness, and that its absence can be related to a longer appearance of the upper lip as well as an older facial appearance (Nunes et al: 2021). Further also useful in better understanding of the relationship between philtrum anomalies and craniofacial abnormalities in order to obtain a more accurate prenatal diagnosis.

Several studies have been conducted in the recent past that includes Ramosa et al. (1976), Khandekar (2005), Ngeow & Aljunid (2009), Al-Khatib et al. (2012), Othman et.al. (2016), Namratha M. et al., (2017), Yadav et.al (2018), Hasibuan et.al (2023), to name a few. But the numbers are still meagre.

Aim of the Study

The aim of present study is to assess and quantify the philtrum in female populations of Lucknow. Being an important character in defining the morphology of face, mouth and upper lip, the study includes both observational and metrical method.

Method And Materials

The total of 600 volunteer healthy females (300 Rajput and 300 Brahmin) were selected and divided according to the age, between 6 to 25 years, from various schools, colleges and households of Lucknow. Four measurements and one observation were done in relaxed posture of the upper lip that was taken with a calibrated sliding calliper and ruler directly on the subjects. In order to make the study significant, statistical consideration were also taken into account like mean standard error, standard deviation. Chi square, t test and P values were further calculated.

Measurements Taken for the Study

1. Philtrum Length: - Sn -Ls
2. Philtrum Breadth/ Width: - Cp- Cp

3. Mouth Width: - Ch-Ch
4. Lip Thickness / Height of Integumental Lip: Ls - Li
5. Philtrum Depth (Observed feature)

Figure 1: Various Landmarks on Face

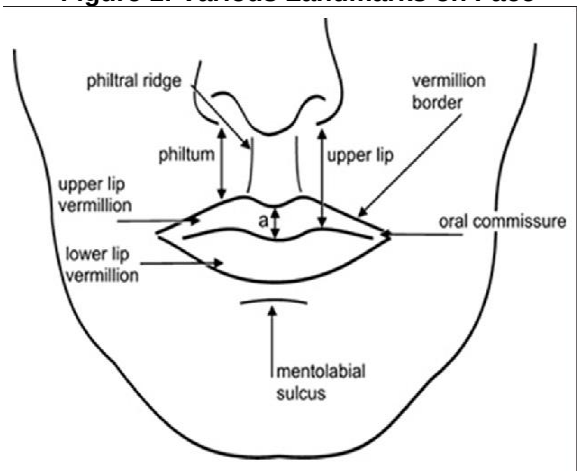
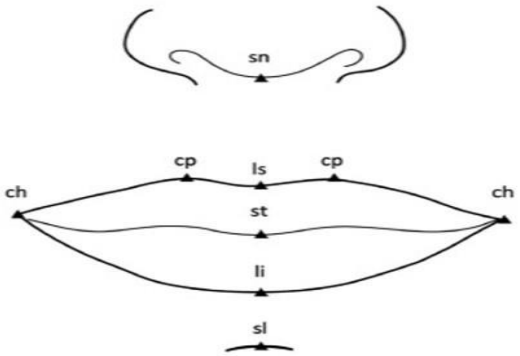


Figure 2: Contours on Nose & Lips



Results

Measurements of Head and Face	Group	Range (cm.)	Mean (cm)	Standard Error (SE)	Standard Deviation (SD)	SE of SD	t- test & p value
Philtrum length	R	1.06 - 1.70	1.09	.16	.18	.07	t- .3750 p ≥ 50, 50 C
	B	1.00 - 1.78	1.12	.12	.45	.07	
Philtrum Breadth/ Width	R	.64 - 1.12	.85	.16	.18	.07	t- 1.800 p ≤ .05, 95 C
	B	.87 - 1.06	.91	.12	.56	.07	
Mouth Width	R	3.56 - 4.8	4.35	.41	.68	.14	t- 5.000 p ≤.001, 99.9C
	B	3.61 - 5.40	3.48	.43	.72	.15	
Lip thickness	R	1.38 - 2.04	1.75	.26	.27	.09	t- 1.571 p ≤ .10, 90 C
	B	1.10 - 2.30	1.86	.23	.29	.08	

Table No. 1 : - Various Measurements of Philtrum, Mouth and Lips in the Present Study

Philtrum length: - The Brahmin females show maximum range of variations (1.00-1.78cms) and the Rajput females (1.06-1.70cms). The mean value for the latter is recorded at 1.09 ± .16cms, and for the former females it is 1.12± .12cms. The student's t-test also shows non-significant difference with t being .3750 and p **≥ 50** among the two groups.

Philtrum Breadth: - The evaluation of this trait reveals that the Rajput females show maximum range of variation for this trait (.64-1.12cms) and lower variation has been sited among the Brahmins (.87-1.06cms). The mean value for the former group is recorded at .85±.16cms, and that for the latter at .91 ±.12cms. The t test has a value of 1.800 and p **≤ .05, 95 C**

Mouth Width: - It is seen from the above table that significant difference exists between the two groups studied. The t test comes out to be 5.000 and p ≤.001, 99.9 Confidence. The mean value for this parameter in case of Rajput females is 4.35 ±.41cms, while that for Brahmin counterparts it is 3.48 ± .43 cms.

Lip Thickness: - the difference for this trait in the group of present study shows non -significant. The mean Value for the Rajput females is 1.75 ± .26cms, while that for Brahmins it is 1.86 ± .23cms. the t test has value of 1.571 and p ≤ .10, 90 C.

Philtrum Depth: - This trait depicts that the Brahmin females have more mildness in their philtrum depth than the Rajput i.e., only 15 percent of the Rajput show mild philtrum depth, whereas for the Brahmin it is 43.3 percent. Moderate depth is observed in 47% of Rajput and 37% of Brahmin.

Table No. 2: - Percentile Occurrence of Philtrum Depth among the Two Groups

Populations	No. of Individual examined	Nil	Mild	Moderate	Severe
Rajputs (R)	300	4	15	47	34
Brahmin(B)	300	1.33	43.3	37	18.3

χ^2> .001= 59.78, d.f. =3

Severity in depth is found to be more among the Rajput (34%) and 18.3% in Brahmin. In 4% of the Rajput females no depth was noticed, even lower for the Brahmins (1.33%). The differences this trait among the two castes group is quite significant as revealed by the chi- square test as χ^2> .001 having a value of 59.78.

Discussion

Comparative Evaluation with Other Populations

After having assessed the degree of similarities as well as differentiation between the populations under study it would be interesting to see the exact standing of the Rajput and Brahmin females with some other populations. An attempt has been made to compare the data only with those populations on whom relevant data were available. It is noticed that the populations of present study vary significantly with the Nepalese from Central Nepal, Malays from West Peninsula Malaysia, Malays from various states in Malaysia, Malays from different locations on Malaysian Peninsular and Indonesian adults in philtrum length, philtrum breadth and mouth width, but Brahmin females of Lucknow show close affinity with North Indian Females in lip thickness, while Rajput females differ.

Table No.3. Comparative chart of Mean and Standard Deviations of Philtrum Measurement with Other Populations.

Name of Measurement	Philtrum Length (mm)	Philtrum Breadth/Width (mm)	Mouth Width (mm)	Lip Thickness (mm)	References
Nepalese (from central Nepal)	12.452 ± 2.2397	10.954 ± 1.448	**----**	**----**	**Yadav S.K. et.al 2018**
Malays (from West Peninsular Malaysia)	12.71 ± 1.95	10.40 ± 1.14	**------**	**-----**	**Othman et.al. (2016)**
Malays (from various states in Malaysia)	12.20 ± 1.8	------	**-------**	**------**	**Ngeow & Aljunid (2009)**
Malays (from different locations on the Malaysian Peninsula)	13.02 ± 1.99	12.31 ± 2.10	**-----**	**-------**	**Al-Khatib et al. (2012)**
Indonesian Adults	13.86 **± 2.23**	14.19 **± 2.23**	49.24 ± 6.06	**------**	**Hasibuan Y.Lisa et.al (2023)**
North Indian Females	11.18 ±1.89	------	44.28 ± 3.22	18.14 ± 2.28	**Goel A. et al (2015)**
Rajput from Lucknow	10.9 ± 1.8	8.5 ± 1.6	43.5 ± 6.8	**17.5** ± 2.6	**Present Study**
Brahmins from Lucknow	11.2 ± 4.5	9.1 ± 5.6	34.8 ± 7.2	18.6 ± 2.3	

Conclusion

Lips, mouth and philtrum make an important aspect of facial morphology. These are defining parameters and give them their unique feature. These also play an important role in defining racial and population classifications and variations throughout the world. It is generally seen from the above study that mouth and philtrum along with lips are showing variability in different populations from different geographical areas. These parameters prove quite helpful in above said, but also points out changes which may have a clinical significance.

List of Abbreviations

1. **Labiale superius (Ls): -** The midpoint of the vermillion border of the upper lip.
2. **Labiale inferius(Li): -** The midpoint of the vermillion border of the lower lip.

3. **Chelion (Ch): -** The point at which the outer ends of the upper and lower lip meet.
4. **Subnasale (Sn): -** The midpoint at the base of the columella.
5. **Crista philtre (Cp): -** The point on the crest of the philtrum, i.e. the vertical groove in the median portion of the upper lip just above the vermillion border.

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Conflict of Interests: - None

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