ORIGINAL ARTICLE

A Study of Facial Index among Patients Visiting Orthodontics Department at Nishtar Institute of Dentistry, Multan

UMAL ASIM[1], ZUBAIR HASSAN AWAISI[2], ZUBAIR AHMED[3]
[1]Postgraduate Resident, [2]Associate Professor & Head, [3]Assistant Professor, Department of Orthodontics, Nishtar Institute of Dentistry, Multan
Correspondence to: Umal Asim, Email: umal-18@hotmail.com, Cell: 0331-4361097

ABSTRACT

Objective: To determine mutifarious facial types of the patients and also determine gender dimorphism.
Study Design: Case-control study
Place and Duration of Study: Department of Orthodontics, Nishtar Institute of Dentistry Multan from 1st December 2020 to 30th June 2021.
Methodology: One hundred patients were included in the study having 50 females and 50 males. The patients were asked to sit up straight with eyes focused on a distant point at eye level. The Bertillon caliper was utilized to measure the morphological face height as a vertical distance from nasion (n) to gnathion (gn). The facial width was estimated transversely as a distance between the right and left zygion (zy) points employing the same caliper.
Results: According to the Banister classification the most common facial type was found to be hypereuriprosopic (52%) which symbolizes very short and broad faces. Euriprosopics were 28% and mesoprosopics were 15%.Pertaining to gender dimorphism both males and females were predominantly hypereuriprosopic (31% in females and 21% in males). The second common face type reported was euriprosopicin males (20%) and for females it was mesoprosopic (10%).
Conclusion: Facial phenotype is strongly influenced by genetic and environmental factors. The most common facial type was hypereuriprosopic followed by euriprosopic.
Keywords: Facial index, Facial type, Gender dimorphism

INTRODUCTION

Face is paramount for an individual's recognition each having its own respective features. There are diverse facial types that are of utmost significance in anthropology, forensics, anatomy and surgery.[1-5] Facial features are a hallmark of various racial and ethnic origins each having a distinctive trait of its own thereby assisting in their identification and also helping in reconstructive surgeries. Facial shape is also a sexually dimorphic trait thereby manifesting distinctive features amongst males and females.[6,7]

Precise quantification of the face such as face height, breadth and facial index are therefore helpful in diagnosing the acquired and genetic aberrations, study of standard and atypical facial contour and also for morphologic measurements.[1,8] The facial index is measured as a ratio of facial height to breadth which is deemed imperative to determine the multifarious facial types. It can be computed utilizing the formula as Facial Index = facial height/facial width × 100.

In orthodontics determination of facial type is indispensable for treatment planning. Variations in facial types should be kept in mind during treatment so as to prevent changing the proportions erroneously at the end of treatment. According to Banister's classification of face types the various type of faces are hypereuriprosopic, euriprosopic, mesoprosopic, leptoprosopic and hyperleptoprosopic. euriprosopics are broad, short faces having facial index range from 80-84.9 Mesoprosopics are average round faces having facial index values between 85-89.9. Leptoprosopic is the long narrow face with facial index values ranging from 90-94.9. Facial index values less than 79.9 and greater than 95 were categorized as hypereuriprosopic and hyperleptoprosopic respectively.[1,3,9,10] Henceforth, orthodontic treatment planning should be done taking into account the facial types, their ethnic disparity and gender dimorphism.

The rationale of this study was to discern mutifarious facial types of the patients and also determine gender dimorphism. This will help in devising the treatment plan so as to improve the facial aesthetics which is the cornerstone of orthodontic treatment. Pertaining to the racial disparity, this study will also assist in identifying the facial types amongst our population aiding the orthodontists in formulating treatment plan. Moreover, this study is the first of its kind and has not been executed in Pakistan earlier.

MATERIALS AND METHODS

Our study comprised 100 subjects with 50 males and 50 females and their ages ranged from 19-30 years. All the patients were in a normal healthy state without any facial asymmetry, scarring or a prior history of cosmetic or reconstructive surgery. The ethical board of the institute approved the study. The patients were notified about the study, its merits and the confidentiality of the collected data. Bertillon caliper was customized that read upto 25 cm to measure facial height and width. The patients were instructed to sit up straight with the eyes looking at a faraway point, at eye level. The morphological height of the face was measured as a vertical distance from nasion (n) to gnathion (gn) utilizing the Bertillon caliper. The facial width was measured transversely between the right and left zygion (zy) points with the aid of the same caliper. The anatomical landmarks were defined as follows:
Nasion (n): The anterior point of the intersection between the nasal and frontal bones.
Gnathion (gn): The most inferior and anterior point on the mandibular symphysis i.e. the point of the chin.
Zygion (zy): The most laterally placed point on the zygomatic arch.
Facial Index: Facial height/Facial width × 100
Banister's classification

Type of Face	Facial Index
Hypereuryproscopic	<79.9
Euryproscopic	80.0-84.9
Mesoproscopic	85.0-89.9
Leptoproscopic	90.0-94.9
Hyperleptoproscopic	95.0 - >95

The facial index was discerned on the basis of anatomical descriptions that are accepted worldwide. The Banister's classification was used to classify the different face types on the basis of facial index values. The data was entered and analyzed using SPSS-20. P≤0.05 was considered as significant.

RESULTS

In accordance with the Banister classification the most common facial type was found to be hypereuriprosopic (52%) which symbolizes very short and broad faces, while 28% were euriprosopics and 15% were mesoprosopics. Pertaining to gender dimorphism both males and females were predominantly hypereuriprosopic (31% in females and 21% in males). The second common face type for males was euriprosopic (20%) while for females it was mesoprosopic (10%). The least common face type amongst males was leptoprosopic (4%) whilst for females it

was hyperleptoprosopic [1%] (Table 1). The gender dimorphism is shown in Table 2.

Table 1: Frequency of Banister classification (n=100)

Banister classification	No.	%
Euriprosopic	28	28.0
Mesoprosopic	15	15.0
Leptoprosopic	4	4.0
Hypereuriprosopic	52	52.0
Hyperleptoprosopic	1	1.0

Table 2: Frequency of genders according to facial index (n=100)

Facial Index	Gender	
	Male	Female
Euriprosopic	20 (40%)	8 (16%)
Mesoprosopic	5 (10%)	10 (20%)
Leptoprosopic	4 (8%)	-
Hypereuriprosopic	21 (42%)	31 (62%)
Hyperleptoprosopic	-	1 (2%)

DISCUSSION

Face is considered the most important feature of human body since it's crucial for one's identity and communication. It is also vital for expressing emotions. Facial Index plays a pivotal role in orthodontics pertaining to different facial types and devising treatment plans accordingly. A regional and ethnic disparity together with gender dimorphism exists amongst numerous facial types. In the present study reported hypereuriprosopic (52%) as the prevalent face type followed by euriprosopic (28%). Ghosh and Malik[2] found out euriprosopic and hypereuriprosopic to be the predominant face type among Santhals of West Bengal. Females were hypereuriprosopic (40.3%) which is in accordance with the results of our study whilst males were dominantly euriprosopic which slightly varies with our results which found males to be hypereuriprosopic. Shah et al also found in her study on Gujarati, Indians, the most prevalent facial type to be hypereuriprosopic and euriprosopic which conforms to the results of this study.[6]

Ozsahin et al[8] in a study on facial shape evaluation amongst Turkish population found out euriprosopic as a predominant face type amongst both males and females which was found out to be the second common face type in our study.

Jeremic et al[11] in a study of facial index in the population of Central Serbia found the dominant facial type to be leptoprosopic which varies considerably from the results of this study. This was one of the least occurring facial types in our study accounting for about 4%.

Multiple studies on Facial Index have also been carried out in different states of India to determine the common facial types in their population, with varying results.[12-17]

This regional and ethnic dissimilitude is pertinent to genetic and environmental factors such as health and life style changes. Gender dimorphism is apt to testosterone levels which lead to changes in the face structure of males. Testosterone levels have been reported to surge 20-30 folds during puberty which has been postulated to explain the increased gender dimorphism in facial appearance as broader forehead, nose, jaw and chin.[18] Moreover, growth peaks late in males as compared to females, around 15 years; so they achieve complete facial development late, yielding a more distinct appearance of features.[19]

CONCLUSION

Face is an idiosyncratic and the most dynamic feature. Genetics and environment have a strong impact on the phenotype of the face and hence is the reason for the regional and ethnic divergence. This study found out hypereuriprosopic and euriprosopic as the prevalent facial types.

REFERENCES

1. Yesmin T, Thwin SS, Afrin Urmi S, Wai MM, Zaini PU, Azwan K. A study of facial index among Malay population. J Anthropol 2014;2014.
2. Ghosh S, Malik SL. Sex differences in body size and shape among Santhals of West Bengal. Anthropologist 2007;9(2):143-9.
3. Vangara SV, Kumar D, Arora NK. A cross-sectional study of facial index in Western Uttar Pradesh population between 18-25 years of age. Asian J Med Sci 2021;12(6):95-100.
4. Kumar M, Muzzafar Lone M. The study of facial index among Haryanvi adults. Int J Sci Res 2013; 2(9):51-3.
5. Amin AA, Rashid ZJ, Noori AJ. Study of facial index among Kurdish population. IJDRD 2016;6(4):9-14.
6. Shah T, Thaker MB, Menon SK. Assessment of cephalic and facial indices: a proof for ethnic and sexual dimorphism. J Forensic Sci Criminol 2015;2(4):101.
7. Osunwoke EA, Amah-Tariah FS, Obia O, Ekere IM, Ede O. Sexual dimorphism in facial dimensions of the Bini's of South-Southern Nigeria. Asian J Med Sci 2011;3(2):71-3.
8. Ozsahin E, Kizilkanat E, Boyan N, Soames R, Oguz O. Evaluation of face shape in Turkish individuals. Int J Morphol 2016; 34(3): 904-8.
9. Pandeya A, Atreya A. Variations in the facial dimensions and face types among the students of a Medical College. JNMA 2018;56(209):531-4.
10. Shetti VR, Pai SR, Sneha GK, Gupta C, Chethan P. Study of Prosopic (Facial) Index of Indian and Malaysian Students. Int J Morphol 2011;29(3).
11. Jeremić D, Kocić S, Vulović M, Sazdanović M, Sazdanović P, Jovanović B, et al. Anthropometric study of the facial index in the population of central Serbia. Arch Biol Sci 2013;65(3):1163-8.
12. Rao CV. Study of Facial Index in Andhra Pradesh Population. Medico Legal Update 2019;19(2): 227-9.
13. Kataria SK, Sharma P, Kataria KR. Comparative Study of Prosopic (Facial) Index of Sindhi Community of Jodhpur District of Rajasthan and other Communities and Races. Int J Anatomy Res 2013;1(3):171-73.
14. Kumar M, Muzzafar Lone M. The study of facial index among Haryanvi adults. Int J Sci Res 2013;2(9):51-3.
15. Saini V, Meena KR. Anthropometric comparison of facial parameters between male and female of Rajasthan. IJHSR 2017; 17(9): 96-9.
16. Devi TB, Singh TN, Singh SJ, Tamang BK. Facial morphology and facial index: A study on secular trend of Meitei male population of Bishnupur District, Manipur, India. Int J Anat Res 2016; 4(4):3279-83.
17. Prasanna PL, Suresh P, Srinivasan K. Anthropometric study of the facial (prosopic) indices: a proof for gender dimorphism. Indian J Dent Educ 2020;13(2).
18. Whitehouse AJ, Gilani SZ, Shafait F, Mian A, Tan DW, Maybery MT, et al. Prenatal testosterone exposure is related to sexually dimorphic facial morphology in adulthood. Proceedings of the Royal Society B: Biol Sci 2015;282(1816): 20151351.
19. Koudelová J, Dupej J, Brůžek J, Sedlak P, Velemínská J. Modelling of facial growth in Czech children based on longitudinal data: Age progression from 12 to 15 years using 3D surface models. Forensic Sci Int 2015;248:33-40.