ORIGINAL ARTICLE ASIAN JOURNAL OF MEDICAL SCIENCES

Evaluation of normal distribution of palpebral fissure among the medical and paramedical students of Eastern Nepal

Surendra Kumar Sah[1], Deepak Chaudhary[2], Shubrato Ghosh[3], Amit Kumar Shah[4]

[1]Assistant Professor, [3]Professor and Head, Department of Anatomy, Nobel Medical College Teaching Hospital, Biratnagar, [2]Lecturer, Department of Anatomy, Devdaha Medical College Teaching Hospital, Butwal, [4]Medical Officer, Department of Medicine, Dadeldhura Hospital, Dadeldhura, Nepal

Submission: 23-01-2022 Revision: 24-03-2022 Publication: 01-05-2022

ABSTRACT

Background: The palpebral fissure (PF) is the space between the upper and lower eyelids when the eye is open. The bilateral orbital region which is located in the face acts as one of the important determinants in the perception of facial attractiveness, youthfulness, and health conditions of the individuals. The PF dimensions may get altered in cases of facial deformities and road traffic traumas. **Aims and Objectives:** The aim of this study was to analyze the mode of distribution of PF dimensions in medical and paramedical students in correlation with gender. **Materials and Methods:** The study was a cross-sectional study conducted in the duration of August 2021–November 2021 including the sample of 300 medical and paramedical students in an equal number of male and female of age group 16–22 years from Nobel Medical College Teaching Hospital, Biratnagar, Nepal. We measured the dimensions of PF during the normal gaze. The data analysis was done using the SPSS version 16. **Results:** The mean length of PF (LPF) in males and females was 23.24 mm and 22.72 mm, respectively. The mean height of PF (HPF) in male and female was 8.52 mm and 8.60 mm, respectively. The difference between males and females LPF and HPF was significant (<0.05). The mean PF index (PFI) in male and female subjects was, respectively, 37.20 and 38.68 which were statistically significant. **Conclusion:** It was found that the LPF and HPF were more in males and PFI was slightly more in females than the male which confirms the sexual dimorphism. The data obtained will be helpful in the esthetic consideration of the student'spersonality as well.

Keywords: Aesthetic; Anthropometry; Medical students; Palpebral fissure; PFI

Access this article online

Website: http://nepjol.info/index.php/AJMS

DOI: 10.3126/ajms.v13i5.42566

E-ISSN: 2091-0576

P-ISSN: 2467-9100

INTRODUCTION

The palpebral fissure (PF) is the space between the upper and lower eyelids when the eye is open. The bilateral orbital region which is located in the face acts as one of the important determinants in the perception of facial attractiveness, youthfulness, and health conditions of the individuals. The PF dimensions may get altered in cases of facial deformities and road traffic traumas. To analyze such deformity, the patient's measurements have to be compared with that of the normal subjects of that particular age, sex, and ethnicity. There is some literature that showed that the morphology and anatomy of PFs vary based on age, sex, and ethnicity.[1] The dimensions of the PF have been found to vary between the different ethnic origins. Since the normal database of one ethnic group may not represent the others, there are the requirements of an ethnically specific database. As esthetically, the orbital region is the most crucial for any plastic surgeon to get the exact value by the help, of which they can easily analyze the parameters.[2]

Establishing a range of normal values is important in formulating a pre-operative plan for an esthetic oculoplastic procedure, as well as in diagnosing and treating abnormalities related to globe projection, trauma, and congenital deformities such as telecanthus

Address for Correspondence:
Dr. Surendra Kumar Sah, Assistant Professor, Department of Anatomy, Nobel Medical College and Teaching Hospital, Biratnagar, Nepal.
Mobile: +977 9842457021. **E-mail:** suren.anat2010@gmail.com

and hypertelorism.[3] Furthermore, the normal values for interpupillary distance are useful in the diagnosis of various syndromes and in surgeries after craniofacial trauma.[4] Farkas studied patients from various races and ages to establish norms, in which he published in his textbook on anthropometry. There are several reports regarding anthropometry of the Asian eyelid, but the articles published so far are concerned with measurements for only a specific age group or anatomical area.[5]

Personality is defined as the differences regarding how a person expresses feelings, emotions, thinking, and behaviors. Different types of personalities might have either a positive or a negative impact on communication skills.[6] Communication is a very useful tool for medical students, especially in terms of doctor-patient communication influencing the patient's trust in the physician's medical judgment, his or her compliance to treatment, and eventually his or her chance to become healthy.[7]

MATERIALS AND METHODS

Study setting

This was a cross-sectional study conducted from August 2021 to November 2021with a sample size of 300 young adults (n=300) consisting of 150 males and 150 females of age groups 16–22 years from the medical and paramedical students of Nobel Medical College.Informed consent was taken from the students regarding the advantages and disadvantages of the study undertaken. The following are the criteria to include and exclude participants.

Inclusion criteria

Apparently, healthy subjects of MBBS I and II year, BDS I and II year,and Paramedics I and II year were included in the study.

Exclusion criteria

The following criteria were excluded from the study:

History of periocular trauma and surgery. Individuals with any congenital abnormalities.

Data collection method

We used a structured questionnaire to record the age. For the purpose of this study, the subjects were made to sit comfortably on a chair in such a way that the subject looked straight forward keeping the face in Frankfurt's line, that is, the inferior border of orbit and the center of external acoustic meatus lies in the same horizontal line. The subjects were also instructed to avoid any voluntary or involuntary facial movement that might disturb the periorbital area and instructed to give the normal gazing of the eye to keep the eyelids open. A digital vernier caliper was used for measuring the different parameters.The procedure of measuring the parameters is shown in Figure 1a-c.

The following anthropometric parameters were measured by direct method and variation according to the gender:

1. Length of PF (LPF): Distance between the medial canthus and lateral canthus.
2. Height of PF (HPF): Distance between the superior margin of eyelid to the inferior margin of eyelid over the pupil.
3. PF Index (PFI) = height of PF/length of PF × 100.

Ethical approval and informed consent

Ethical approval was obtained from the Institutional Review Committee of Nobel Medical College, Biratnagar. Informed consent was obtained from all the participants after providing them brief information about the study.

Statistical analysis

The results were calculated as Mean ± Standard Deviation. The data were analyzed using BM SPSS Statistics for Windows, version 20.0.Armonk, NY; IBM Corp., and $P \leq 0.05$ is considered as the level of significance.

RESULTS

Results are presented in the tabulated form in Tables 1 and 2. The minimum value of the length of palpebral fissure in male was 14.84 mm and 16.44 mm in females. The maximum value of the length of PF in males was 32.35 mm and 29.74 mm in females. The mean length of PF in males and females was 23.24 mm and 22.72 mm, respectively. The difference between male and female LPF was significant (<0.05). The minimum value of the height of PF in males was 5.67 mm and 6.71 mm in females. The maximum value of the height of PF in males was 10.70 mm and 9.86 mm in females. The mean height of PF in males and females was 8.52 mm and 8.60 mm, respectively. The difference between male and female LPF was significant (<0.05). The PFI was also calculated, where it was observed that the mean PFI in male and female subjects was, respectively, 37.20 and 38.68 which are statistically significant.

DISCUSSION

There are few reference works and little literature on the anthropometry of the Asian eyelid. Furthermore, the studies conducted in Asia were limited to the Eastern population. This lack of literature shows the urgent need to establish reference values for the eyelid in the Indian population. We believe that the present study is not only intended to establish normal values, but also to provide a denominator for the future studies on the subject.

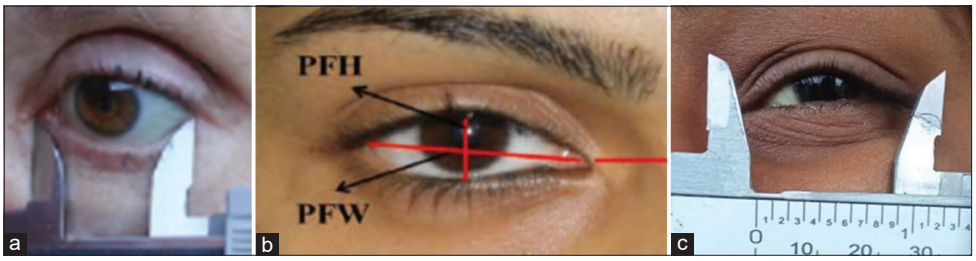

Figure 1: (a-c) The procedure of measuring the parameters taken for the study

Table 1: Showing parameters of students

	MBBS stream			BDS stream			Paramedical stream		
	1st Year	2nd Year	Total	1st Year	2nd Year	Total	1st Year	2nd Year	Total
Male (150)	73	47	**120**	01	04	**05**	17	08	**25**
Female (150)	27	43	**70**	05	10	**15**	35	30	**65**
Total (300)	100	90	**190**	06	14	**20**	52	38	**90**

Table 2: Palpebral fissure of students

Parameters	Minimum(in mm)		Maximum(in mm)		Mean(in mm)		
	Male	Female	Male	Female	Male	Female	P value
Length of Palpebral Fissure	14.84	16.44	32.35	29.74	23.24	22.72	0.038(<0.05)
Height of Palpebral Fissure	5.67	6.71	10.70	9.86	8.52	8.60	0.036(<0.05)
Palpebral Fissure Index	25	28	47	48	37.20	38.68	0.036(<0.05)

The LPF is important for the overall size and appearance of the eye. Adler reported a mean value of 25 mm in a heterogeneous population.[8] Farkas et al., reported a mean value of 31.0 mm in Caucasian adults of both sexes. Many studies of such anthropometry have been reported from South Korea. These studies are primarily referred to as the "prototype studies" in the Asian populations.[9] Baek et.al, reported to the average value of 29.1 mm in adults.[10] Park et al., reported mean values of 29.7 mm in men and 28.4 mm in women.[11] Cho et al., reported values of 34.2 mm in men and 33.4 mm in women.[12] Park et al., found slightly lower values, 27 mm in men and 26.8 mm in women. Their data suggest that the PFW reaches its peak level of growth by 10–13 years of age.[13] In the present study, the mean value of LPF in males was 23.24 mm and in the female, it was calculated as 22.72 mm. These values are slightly less than the study done by Farkas and Park et al.

The mean height of the PF has been extensively studied in various racial groups. Moses reported peak values of approximately 8–10 mm, with no significant difference between Caucasians and Africans.[14] Duke-Elder reported a mean value in the Western population of 9–13 mm.[15] In Asia, Jung and Hong reported mean values of 8.2 mm in Korean men and 8.5 mm in women.[16] In the present study, the mean value of the HPF in the male subjects was 8.52 mm and 8.60 mm in females which are similar to the study done by Jong and Hong in Korean populations. The study done by Vasantha kumar et.al., constructed that there was a statistically significant gender difference in palpebral parameters between males and females.[17] The present study also showed the similar type of results while comparing gender-wise. In a study done by Kim, in elder women of Korea suggested that the PF and exophthalmos showed a significant relationship in the mean value which was correlating the eyeball diameter.[18] In the present study, the PFI was also considered for the study and the value calculated was 37.20 and 38.68 in males and females, respectively, which were not considered in previously done studies.

Limitations of the study

The study was confined to the Palpebral fissure. Nasal Index was not studied.

CONCLUSION

In the present study, it was found that the LPF and HPF were more in male and PFI was slightly more in females than the males which confirm the sexual dimorphism. In forensic investigation, sex determination is a convincing standard for identification in various cases. The difference in the PFI of males and females was found to be 1.0 and this fact can be of some help for gender identification. As the study was conducted regarding the medical and paramedical students, the data collected will be helpful in the esthetic consideration of the student's personality as

well, as now a days, the students are more concerned about the esthetic importance of their personality.

ACKNOWLEDGMENT

First of all, I would like to thank the managing director of Nobel Medical College Teaching Hospital, Biratnagar, Nepal for providing the platform to carry out the study in the Department of Anatomy and special thanks goes to the respondents and subjects in cooperating in data collection.

REFERENCES

1. Kunjur J, Sabesan T and Ilankovan V. Anthropometric analysis of eyebrows and eye-lids: An inter-racial study. Br J Oral Maxillofac Surg. 2006;44(2):89-93.
   https://doi.org/10.1016/j.bjoms.2005.03.020
2. Osuobeni EP and Al-Gharni SS. Ocular and facial anthropometry of young adult males of Arab origin. Optom Vis Sci. 1994;71(1):33-37.
   https://doi.org/10.1097/00006324-199401000-00007
3. Mathog RH and Bauer W. Posttraumatic pseudo hypertelorism. Arch Otolaryngol. 1979;105(2):81-85.
   https://doi.org/10.1001/archotol.1979.00790140027005
4. Hanson JW Jones KL and Smith DW. Fetal alcohol syndrome experience with 41 patients. JAMA. 1976;235(14):1458-1460.
   https://doi.org/10.1001/jama.235.14.1458
5. Farkas LG. Anthropometry of the Head and Face. 2nd ed. New York: Raven Press; 1994. p. 103-111.
6. Personality. Available from: https://www.apa.org/topics/personality [Last accessed on 2021 Jun 29].
7. Borţun D, and Matei CS. Aspects of communication in medical life. Doctor-patient communication: Differentiation and customization. J Med Life. 2017;10(1):60-65.
8. Adler FH. Physiology of the Eye. 2nd ed. St Louis, MO: Mosby; 1975. p. 13.
9. Farkas LG, Sohm P, Kolar JC, Katie MJ and Munro R. Inclination of the facial profile: art versus reality. Plast Reconstr Surg. 1985;75(4):509-519.
   https://doi.org/10.1097/00006534-198504000-00011
10. Baek SW, Kim H, Park SH and Bang YH. Anthropometric analysis of palpebral fissure. Korean Soc Aesthetic Plast Surg. 1995;1:221.
11. Park DM, Song Han KW and Kang JS. Anthropometry of Korean eyelids. Korean Soc Aesthetic Plast Surg. 1990;17:822.
12. Cho JH, Han KH and Kang JS. Normal anthropometric values and standardized templates of Korean face and head. Korean Soc Aesthetic Plast Surg. 1993;20:995.
13. Park DH, Choi WS, Yoon SH and Song CH. Anthropometry of Asian eyelids by age. Plast Reconstr Surg. 2008;121(4):1405-1413.
   https://doi.org/10.1097/01.prs.0000304608.33432.67
14. Moses RA. Adler's Physiology of the Eye. 8th ed. St Louis, MO: Mosby; 1987. p. 13.
15. Duke-Elder S. System of Ophthalmology. St Louis, MO: Mosby; 1916. p. 205.
16. Jung TM and Hong SK. The exophthalmometry, extraorbital width and height of lid fissure of Koreans. Korean Ophthalmol Soc. 1974;15(4):305-311.
17. Vasanthakumar P, Kumar P and Rao M. Anthropometric analysis of palpebral fissure dimensions and its position in South Indian Ethnic Adults. Oman Med J. 2013;28(1):26-32.
   https://doi.org/10.5001/omj.2013.06
18. Kim DH. Correlation between Palpebral fissure and exophthalmos of the elder women in Korea. J Korean Clin Health Sci. 2015;3(3):427-34.
   https://doi.org/10.15205/kschs.2015.3.3.427

Authors Contribution:
SKS- Concept and design of study and prepared the first draft of the manuscript; **DC-** Interpreted the results and manuscript preparation; **SG-** Reviewed the manuscript; and **AKS-**Revision of the manuscript

Work attributed to:
Nobel Medical College Teaching Hospital, Biratnagar, Nepal

Orcid ID:
Dr. Surendra Kumar Sah - https://orcid.org/0000-0002-3264-1510
Dr. Shubrato Ghosh - https://orcid.org/0000-0001-5840-8867
Deepak Chaudhary - https://orcid.org/0000-0003-3358-0198
Dr. Amit Kumar Shah - https://orcid.org/0000-0002-1450-6550

Source of Support: Nil, **Conflict of Interest:** None declared.