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Research Article

Periocular Anthropometric Measurements Among Adolescent Igbos In Asaba, Nigeria

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Abstract

This Study Was Conducted On Adolescents Who Were 10-19 Years Old. The Purpose Of This Study Is The Documentation Of The Anthropometric Analysis Of The Horizontal Palpebral Fissure, Vertical Palpebral Fissure, The Upper Eyelid Crease, The Brow Height And The Margin Reflex Distance.The Mean Age Recorded From The Descriptive Analysis Conducted On The Total Study Sample (N=384) Was 13 ± 2 Years. The Frequency And Percentage Distribution For Gender Revealed That Lesser Number Of Male Subjects Participated In The Study Having A Frequency Of 181 And A Percentage Of 47.1% When Compared To The Female Subjects Who Scored A Frequency Of 203 And A Percentage Of 52.9%. The Mean Value Of The Male Horizontal Palpebral Fissure Recorded Was 3 ± 0.090cm. The Female Subjects Recorded A Mean Horizontal Palpebral Fissure Value Of 3 ± 0.085 Cm. The Result Of The T-Test Analysis Conducted To Compare These Gender Means Showed No Significant Difference Between The Means (P>0.05). The Mean Value Of The Male Vertical Palpebral Fissure Recorded Was 0.957 ± 0.059 Cm. The Female Subjects Recorded A Mean Vertical Palpebral Fissure Value Of 0.951 ± 0.055cm. The Result Of The T-Test Analysis Conducted To Compare These Means Showed No Significant Gender Difference (P>0.05). The Mean Value Of The Male Upper Eyelid Crease Recorded Was 0.849 ± 0.131cm. The Female Subjects Recorded A Mean Upper Eyelid Crease Value Of 0.84 ± 0.114 Cm. The Result Of The T-Test Analysis Conducted To Compare These Gender Means Showed No Significant Difference Between The Means (P>0.05). The Mean Value Of The Male Brow Height Recorded Was 1.190 ± 0.089 Cm. The Female Subjects Recorded A Mean Brow Height Value Of 1.196 ± 0.082 Cm. The Result Of The T-Test Analysis Conducted To Compare These Means Showed No Significant Gender Difference (P>0.05). The Mean Value Of The Male Marginal Reflex Distance Recorded Was 0.410 ± 0.58 Cm. The Female Subjects Recorded A Mean Marginal Reflex Value Of 0.400 ± 0.58cm. The Result Of The T-Test Analysis Conducted To Compare These Means Showed No Significant Gender Difference Between The Means (P>0.05). Gender Is Not An Imperative Demographic Determinant Of The Periocular Anthropometric Parameters Of Adolescent Igbos In Asaba, Nigeria.

Keywords: Periocular, Anthropometric, Parameters, Adolescent, Igbos, Asaba

Introduction

Periocular Anthropology Is The Study Of The Structures That Surrounds The Eyeball Which Are Also Within The Orbit. Assessment Of Periorbital Landmarks Is Categorized Into Three Subclasses: Periorbital Soft Tissue, Bony Orbit, And Ocular Projection. Measurements Of Periorbital Soft Tissue Includes The Position Of Eyelids, Height Of Eyelid Skin Crease And Eyebrows, Palpebral Slant Angle, Position Of The Canthal Commissura, Epicanthal Folds, Horizontal And Vertical Palpebral

Apertures And Margin Reflex Distances, Which Reflect Eyelid Position Relative To The Eye Globe. The Bony Orbit Is The Socket That Encompasses The Extraocular Muscles, And The Eye With Its Appendages And Its Measurements Include Interorbital Distance, Interorbital Angles, Inter-Canthal Distances (Between Both Medial And Lateral Canthi), And Interpupillary Distance Which Are Parameters Included During Evaluation Of Subjects. The Last Parameter Of The Periorbital Anthropometry, The Ocular Projection Is One Of The Most Widely Used Parameters In Diagnosis Of Orbital Disorders. It Reflects The Intraorbital Volume To Content Relationship. It Is Especially Significant In Orbital Tumors And Graves' Orbithopathy (Umit *Et Al*., 2012).

The Horizontal Palpebral Fissure (Hpf) Is The Distance Between The Medial And Lateral Canthus. The Vertical Palpebral Fissure (Vpf) Is The Distance Between The Upper And Lower Lid Margins Measured At The Pupillary Midline. The Upper Eyelid Crease (Ulc) Is The Distance Between The Upper Eyelid Lash Line And The Upper Eyelid Crease In Down Gaze. The Brow Height (Bh) Is The Distance From The Upper Eyelid Lash Line To The Inferior Border Of The Eyebrow At Its Highest Point. The Margin Reflex Distance (Mrd) Is The Distance Between The Upper Eyelid Margin And The Corneal Light Reflex At The Centre Of The Pupil.

The Aim Of The Study Is The Documentation Of The Anthropometric Analysis That Defined The Horizontal Palpebral Fissure, Vertical Palpebral Fissure, The Upper Eyelid Crease, The Brow Height And The Margin Reflex Distance Among Adolescent Igbos In Asaba, Nigeria. A Paucity Of Data Exists On The Periocular Dimensions Of The Index Population And That Is The Validation Of This Inquiry. This Inquisition Recorded Information That Could Be Used For Clinical Appraisal, Craniofacial Surgical Procedures And Anthropologic Assessment In The Studied Populace.

Materials And Methods

This Study Is A Descriptive Cross-Sectional Type Of Observational Study Done In April, 2015. The Study Sample For This Research Work Was Composed Of Three Hundred And Eighty-Four (384) Subjects Who Were One Hundred And Eighty-One (181) Males And Two Hundred And Three (203) Females Within The Age Group Of 10-19 Years Old From Asaba In Nigeria. Before The Study, Approval Was Obtained From The Ethics Committee, Department Of Human Anatomy And Cell Biology, Faculty Of Basic Medical Sciences, Delta State University, Abraka. Consent Was Obtained From Each Participant As Voluntary Subjects Were Allowed To Participate In The Exercise And This Conformed To The Permission Of The Declaration Of Helsinki (Tyebkhan, 2003). The Materials That Were Used For The Measurements During The Course Of This Research Were: Calculator And A Non-Stretchable Plastic Ruler.

The Method That Was Used In Assessing The Periocular Dimensions Was That Of Ozturk *Et Al*., (2006). The Measurements Were Obtained With The Subject And The Observer Comfortably Seated In A Well-Illuminated Room And Their Eyes Placed At The Same Horizontal Level. Measurements Were Taken With The Subject's Eye In The Primary Position Of Gaze. Each Measurement Was Taken Thrice In Each Eye And Averaged; The Mean Of The Three Measurements Were Then Entered For Analysis. Data That Was Obtained Was Subjected To Statistical Analysis Using The Statistical Package For The Social Sciences (Spss) Version 18. Statistical Tests For Gender Differences Were Performed Using The Independent Sample T- Test. In All, A $P<0.05$ Was Considered Significant.

Results

Table 1: Descriptive Statistics For Age Of The Study Sample

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	N	Minimum	Maximum	Mean	Standard Deviation
Age Of Subjects (Years)	384	10.00	19.00	12.5573	2.38508

From Table1 Above, The Mean Age Recorded From The Descriptive Analysis Conducted On The Total Study Sample (N=384) Was 13 Years With Minimum And Maximum Age Values Of 10 And 19 Years.

Table 2: Gender Frequencies And Percentage Of The Study Sample

	Frequency (N)	Percentage (%)
Male	181	47.1%
Female	203	52.9%
Total (N)	384	100.0%

From Table 2 Above, The Frequency And Percentage Distribution For Gender Of The Sample Population (N=384) Revealed That Lesser Number Of Male Subjects Participated In The Study When Compared To The Female Subjects.

Table 3: Horizontal Palpebral Fissure

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Standard Error
Horizontal Palpebral Fissure Of Male Subjects	181	3.00	3.50	3.1676	.09076	.424	.181
Horizontal Palpebral Fissure Of Female Subjects	203	3.00	3.40	3.1692	.08513	.150	.171
Valid N (Listwise)	181						

The Mean Value Of The Male Horizontal Palpebral Fissure Was 3.168 ± 0.090cm With A Minimum And A Maximum Value Of 3.00cm And 3.50cm Respectively. The Female Subjects Had A Mean

Horizontal Palpebral Fissure Value Of 3.169 ± 0.085cm With A Minimum And Maximum Value Of 3.00cm And 3.40cm Respectively (Table3).

Table 4: Vertical Palpebral Fissure

	N	Minimum	Maximum	Mean	Standard Deviation	Skewness	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Standard Error
Vertical Palpebral Fissure Of Male Subjects	181	.70	1.07	.9574	.05952	-1.003	.181
Vertical Palpebral Fissure Of Female Subjects	203	.80	1.07	.9510	.05547	-.282	.171
Valid N (Listwise)	**181**						

The Mean Value Of The Male Vertical Palpabral Fissure Was 0.957 ± 0.059cm With A Minimum And A Maximum Value Of 0.70cm And 1.07cm Respectively. The Female Subjects Had A Mean Vertical Palpabral Fissure Value Of 0.951 ± 0.055cm With A Minimum And Maximum Value Of 0.80cm And 1.07cm Respectively (Table 4).

Table 5: Upper Eyelid Crease

	N	Minimum	Maximum	Mean	Standard Deviation	Skewness	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Standard Error
Upper Eyelid Crease Of Male Subjects	181	.10	1.10	.8491	.13156	-1.069	.181
Upper Eyelid Crease Of Female Subjects	203	.50	1.10	.8373	.11457	-.161	.171
Valid N (Listwise)	**181**						

The Mean Value Of The Male Upper Eyelid Crease Was 0.849 ± 0.131cm With A Minimum And A Maximum Value Of 0.10cm And 1.10cm Respectively. The Female Subjects Had A Mean Upper Eyelid Crease Value Of 0.837 ± 0.114cm With A Minimum And Maximum Value Of 0.50cm And 1.10cm Respectively (Table5).

Table 6: Brow Height

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	N	Minimum	Maximum	Mean	Standard Deviation	Skewness	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Standard Error
Brow Height Of Male Subjects	181	1.00	1.50	1.1901	.08957	.365	.181
Brow Height Of Female Subjects	203	1.00	1.57	1.1963	.08202	1.075	.171
Valid N (Listwise)	181						

The Mean Value Of The Male Brow Height Was 1.190 ± 0.089cm With A Minimum And A Maximum Value Of 1.00cm And 1.50cm Respectively. The Female Subjects Recorded A Mean Brow Height Value Of 1.196 ± 0.082cm With A Minimum And Maximum Value Of 1.00cm And 1.57cm Respectively (Table 6).

Table 7: Marginal Reflex Distance

	N	Minimum	Maximum	Mean	Standard Deviation	Skewness	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Standard Error
Marginal Reflex Distance Of Male Subjects	181	.30	.50	.4098	.05775	-.178	.181
Marginal Reflex Distance Of Female Subjects	203	.30	.50	.4001	.05780	.259	.171
Valid N (Listwise)	181						

The Mean Value Of The Male Marginal Reflex Distance Was 0.410 ± 0.577cm With A Minimum And A Maximum Value Of 0.30cm And 0.50cm Respectively. The Female Subjects Had A Mean Marginal Reflex Value Of 0.400 ± 0.578cm With A Minimum And Maximum Value Of 0.30cm And 0.50cm Respectively (Table7).

Table 8: Descriptive Statistics For Mean Values Of The Studied Anthropometric Parameters Of Horizontal Palpebral Fissure (Hpf), Vertical Palpebral Fissure (Vpf), Upper Eyelid Crease (Ulc), Brow Height (Bh) And Marginal Reflex Distance (Mrd) For Both Gender

		N	Minimum	Maximum	Mean	Standard Deviation
Horizontal Palpebral Fissure	**Male**	181	3.00	3.50	3.1676	0.09076

	Female	203	3.00	3.40	3.1685	0.08513
Vertical Palpebral Fissure	**Male**	181	0.70	1.07	0.9574	0.05952
	Female	203	0.80	1.07	0.9510	0.05547
Upper Eyelid Crease	**Male**	181	0.10	1.10	0.8491	0.13156
	Female	203	0.50	1.10	0.8373	0.11457
Brow Height	**Male**	181	1.00	1.50	1.1901	0.08957
	Female	203	1.00	1.57	1.1963	0.08202
Marginal Reflex Distance	**Male**	181	0.30	0.50	0.4098	0.5775
	Female	203	0.30	0.50	0.4001	0.5780

Table 8 Above Presents Descriptive Statistics Of The Studied Anthropometric Parameters Of Horizontal Palpabral Fissure (Hpf), Vertical Palpabral Fissure (Vpf), Upper Eyelid Crease (Ulc), Brow Height (Bh), And Marginal Reflex Distance (Mrd) For Both Genders.

The Result Of The T-Test Analysis Conducted To Compare The Mean Of Horizontal Palpebral Fissure (Hpf), Vertical Palpebral Fissure (Vpf), Upper Eyelid Crease (Ulc), Brow Height (Bh), And Marginal Reflex Distance (Mrd) For Both Genders Showed No Significant Gender Differences Between The Means (P>0.05).

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Table 9:   Showing Independent Samples T Test Of Horizontal Palpebral Fissure Of Male And Female Subjects.

Independent Samples T Test

		Gender Differences					T	Df	Sig. (2-Tailed)
		Mean	Standard Deviation	Standard Error Of Mean	95% Confidence Interval Of The Difference				
					Lower	Upper			
Pair 1	Horizontal Palpebral Fissure Of Male Subjects - Horizontal Palpebral Fissure Of Female Subjects	-.00094	.12081	.00898	-.01866	.01678	-.105	180	.917

Table 10:   Showing Independent Samples T Test Of Vertical Palpebral Fissure Of Male And Female Subjects.

Independent Samples T Test

Paired Differences		T	Df	Sig. (2-

		Mean	Standard Deviation	Standard Error Of Mean	95% Confidence Interval Of The Difference				**Tailed)**
					Lower	Upper			
Pair 1	Vertical Palpebral Fissure Of Male Subjects Vertical Palpebral Fissure Of Female Subjects	.00459	.07591	.00564	-.00655	.01572	.813	180	.417

Table 11:   Showing Independent Samples T Test Of Upper Eyelid Crease Of Male And Female Subjects.

Paired Samples Test									
		Paired Differences					**T**	**Df**	**Sig. (2-Tailed)**
		Mean	Standard Deviation	Standard Error Of Mean	95% Confidence Interval Of The Difference				
					Lower	Upper			
Pair 1	Upper Eyelid Crease Of Male Subjects Upper Eyelid Crease Of Female Subjects	.02204	.18316	.01361	-.00482	.04891	1.619	180	.107

Table 12:   Showing Independent Samples T Test Of Brow Height Of Male And Female Subjects.

Paired Samples T Test									
		Paired Differences					**T**	**Df**	**Sig. (2-Tailed)**
		Mean	Standard Deviation	Standard Error Of Mean	95% Confidence Interval Of The Difference				
					Lower	Upper			
Pair 1	Brow Height Of Male Subjects Brow Height Of Female Subjects	.00917	.11833	.00880	-.02653	.00818	1.043	180	.298

Table 13:   Showing Independent Samples T Test Of Marginal Reflex Distance Of Male And Female Subjects.

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Paired Samples T Test

		Paired Differences					T	Df	Sig. (2-Tailed)
		Mean	Standard Deviation	Standard Error Of Mean	95% Confidence Interval Of The Difference				
					Lower	Upper			
Pair 1	Marginal Reflex Distance Of Male Subjects Marginal Reflex Distance Of Female Subjects	.01072	.07877	.00585	.00083	.02227	1.831	180	.069

Discussion

This Present Study Is Reported On Adolescent Males And Females Who Are 10-19 Years Old. Similar Study In Age Range Has Been Reported In Nigeria (Jaja *Et Al*., 2001), (Boniface *Et Al*., 2013), Turkey (Cem *Et Al*., 2002) And In Zaire (Kiambo And Kayembe, 2014). Gender Distribution Of The Participants Were Similar To Those Reported In Indian (Gupta *Et Al*., 2003), Southern Thailand (Preechawai, 2011), Zaire (Kiambo And Kayembe, 2014), Ijaw And Igbos (Oladipo *Et Al*., 2008), Nigeria (Boniface *Et Al*., 2013, Jaja *Et Al*., 2001), Malay (Chung *Et Al*., 2014), Turkey (Cem *Et Al*., 2002, Ozturk *Et Al*., 2006). However, Studies On The Age Range Reported In Indian (Gupta *Et Al*., 2003), Ijaw And Igbos (Oladipo *Et Al*., 2008), Nigeria (Jaja *Et Al*., 2001), Malay (Chung *Et Al*., 2014), Bangladeshi Buddhist (Asma *Et Al*., 2014), Saudi Arabia (Amal *Et Al*., 2011) Are Dissimilar To This Present Study.

Participants' Gender Distribution In This Study Was Also Dissimilar To Those Reported In Bangladeshi Buddhist (Asma *Et Al*., 2014) And Saudi Arabia (Amal *Et Al*., 2011) Whose Reports Were Only On Females. In This Present Study, There Is No Significant Difference In The Mean Values Of The Horizontal Palpebral Fissure (Hpf), Vertical Palpebral Fissure (Vpf), Upper Eyelid Crease (Ulc), Brow Height (Bh), Marginal Reflex Distance (Mrd) Between The Males And Females. The Absence Of Gender Differences In The Mean Values Of The Hpf And Vpf Is Similar To The Findings Of Ozturk *Et Al*., 2006 But Differed From The Values Reported By Van Den Bosch *Et Al*., (1999). The Observed Differences Between Surveys Probably Reflect Ethnic Differences Between The Study Populations, Variable Age Of Study Participants Or Both (Boniface *Et Al*., 2013).

The Upper Eyelid Crease (Ulc) Values Of This Present Study Are Similar To Those Reported By Kristina *Et Al*., (2009) And Higher Than The Values Obtained By Ozturk *Et Al*., (2006). The Observed Discrepancies Of Ulc Measurements Between Surveys On Different Ethnic Groups And The Similarity Of The Measured Ulc Values With Those Of The Black African Americans Probably Further Underscore The Dominant Role Of Racial Background In The Determination Of Periocular Anatomical Parameters. These Findings Have Significant Clinical Implications For Clinicians (Boniface *Et Al*., 2013).

The Mean Brow Height Measurement Reported By Ozturk *Et Al*., (2006) Was Lower Than The Mean Values Obtained In This Present Study. According To Van Den Bosch *Et Al*., (1999), Epilation Of Eye Lashes And Cosmetic Brow Alopecia's Which Are Common Practices In The Females Could

Influence Brow Measurements. In Other Words, This Present Study Provided Gender-Specific Anthropometric Data In Adolescent Igbos In Asaba Delta State. Overall, The Marginal Reflex Distance (Mrd) Values Obtained From This Present Study Tend To Be Higher In Both Males And Female When Compared To The Values Obtained By Orientals And Brazilians Of Japanese Descent (Takahagi *Et Al*., 2008).

Conclusion

This Study Showed That Gender Is Not An Imperative Demographic Determinant Of The Periocular Anthropometric Parameters Of Adolescent Igbos In Asaba, Delta State.

References

1. Asma, M., Laila, A. & Azmeri, S. (2014). Periocular Anthropometric Study Among Adult Bangladeshi Buddhist Chakma Females. Journal Of Medical And Allied Sciences, 4(1): 28-34.
2. Boniface, I.E., Judith, N.U., Jude, O.S. & Chibuike, N.M. (2013). Oculopalpebral Dimensions Of Adult Nigerians: Report From The Enugu Normative Ocular Anthropometry Study. Journal Of Medical Principles And Practice, 22:75-79.
3. Evereklioglu, C., Dogany, S., Hamdi, E.R., Gunduz, A., Tercan, M., Balat, A. & Cumurcu T. (2002). Craniofacial Anthropometry In A Turkish Population. Cleft Palate Craniofacial Journal, 39(2):208-218.
4. Gupta, V.P., Sodhi, P.K. & Pandey, R.M. (2003). Normal Values For Inner Intercanthal Distances In The Indian Population. International Journal Of Clinical Practice, 57(1): 25-29.
5. Kristina, M., Preeya, K., Woodward, J., Stinnet, S. & Murchison, A. (2009). Eyebrow And Eyelid Dimensions: Anthropometric Analysis Of African Americans And Caucasians. Plastic Reconstructive Surgery, 124(1):615–623
6. Oladipo, G., Ugbonna, A. & Oyakhire, M. (2008). The Circumference Interorbital Index Of The Ijaw And Igbo Ethnic Groups In Nigeria. The Internet Journal Of Anthropology, 3(2).
7. Ozturk, F., Yavas, G. & Inam, U. (2006). Normal Periocular Anthropometric Measurements In The Turkish Population. Journal Of Ophthalmic Epidemiology, 13:145-149.
8. Prechawai, J. (2011). Anthropometry Of Eyelid And Orbit In Four Southern Thailand Ethnic Groups. Journal Of Medical Association Thailand, 94(2):193-199.
9. Takahagi, R., Schellini, S., Padovani, C., Ideta, S., Katori, N. & Nakamura, Y. (2008). Oriental Oculopalpebral Dimensions: Quantitative Comparison Between Orientals From Japan And Brazil. Clinical Ophthalmology, 2(1):563–567.
10. Umit, B. & Matej, B. (2012). Periorbital Anthropometric Measurements. Handbook Of Anthropometry, 1(1):641-654.
11. Van Den Bosch, W., Leenders, I., Mulder, P. (1999). Topographic Anatomy Of The Eyelids, And The Effects Of Sex And Age. Brazilian Journal Of Ophthalmology, 83(1):347–352.
12. Wu, K.H., Tsai, F.J., Li, T.C., Tsai, C.H., Peng, C.T. & Wang, T.R. (2000). Norma Values Of Inner Canthal Distance, Interpupillary Distance And Palpebral Fissure Length In Normal Chinese Children In Taiwan. Acta Paediatrica Taiwan, 41(1):22-27.
13. Zuhal, S. (1994). Craniofacial Anthropometry Of Kabui Naga. Anthropologist, 8(1):1-3.