Journal of Scientific and Innovative Research 2013; 2 (3): 525-528
Available online at: www.jsirjournal.com

Short Communication

ISSN 2320-4818
JSIR 2013; 2(3): 525-528

Received: 30-07-2013
Accepted: 10-08-2013

Abue A. D.*
Department of Anatomical Sciences, College of Health Science, University of Abuja, Nigeria

Didia B. C.
Department of Anatomy, College of Health Science, University of Port Harcourt, Nigeria

Correspondence:
Abue A. D.
Department of Anatomical Sciences, College of Health Science, University of Abuja, Nigeria
E-mail:
drandrewabuee@hotmail.com

Loop Dermatoglyphics Patterns on the Plantar Surface of the Sole in Hausa Ethnic Group of Nigeria

Abue A.D., Didia B.C.

Abstract

In science of dermatoglyphics involves the study of epidermal ridges present on the surface of the palms, fingers, soles and toes plantar. The dermatoglyphic loop pattern of the Hause had not been studied extensively. This prompted the study. Most research work will correlate these results with what is tenable in southern Nigeria and other part of the world. A cross-sectional survey was carried out on bilaterak plantar and digital prints of the sole. There was a significant difference in the percentage frequencies in both sexes and the feet, the distribution of loop patterns was found greatest on the right sole i.e Hallucal area (63%). They were more loops in the females than males in the Hausa.

Keywords: Dermatoglyphics, Digits, Loop, Patterns, Ridges.

Introduction

The Science of Dermatoglyphics involves the study of epidermal ridges present on the surface of the palms, fingers, soles and toes.[1] Sir Francis Galton in 1892 classified patterns in the soles, palms, toe and digits into (i) Arches (ii) Loops and whorls.

Anthropologically, the Hausas as a people are in the Northern part of Nigeria. They lie between the Kanuris in the East and Songhai in the West, and they extend from the Niger-Benue sometimes to the South of Agades. The Hausa speaking states in Nigeria include Borno, Yobe, Taraba, Sokoto, Zamfara, Katsina, Kano, Kaduna, Jigawa, Nasarawa and Niger states.

Materials and Method

A cross sectional survey was carried out on bilateral plantar and digital prints of the sole. Prints were obtained using the ink procedure of Cummins and Midlo. Different plantar and digital patterns of Arches, loops and whorls were counted and classified with the aid of a hand lens using Loesch and Skrinjaric method. The frequencies of the ridge pattern were expressed as percentages of the total pattern type and analyze using Cummins and midlo method.

The plantar surface of the feet were divided into10 zones based on Cummins and

midlo's – Nomenclature, here zones i – v represented the distal plantar surface while zones vi – x represented the proximal plantar surface.[1]

The pattern intensity index (PII) is the mean number of triradii found on toes per individual.

The Dankmeijer index (DI) is the total frequency of arches divided by the total frequency of whorls x 100.

These (PII and DI) are the determinant of variability of digital patterns.[2-9]

Results and discussions

Table 1:1 shows numerical count of loop patterns on the proximal and distal sole

Sample		NO.	I	I	I^t	I^f	II	II	III	III	IV	IV	V	V^F	V	VI	VI	X^t
Male	L	222	70	20	30	102	46	52	31	85	87	44	34	16	24	16	19	17
	R	222	92	20	31	95	46	54	31	73	82	43	46	16	24	15	30	16
Female	L	135	70	21	45	61	50	51	53	56	38	32	25	16	20	30	18	16
	R	135	85	25	42	51	48	53	37	42	60	30	30	18	22	12	21	17
Male & Female	L	357	140	41	75	163	96	103	68	141	125	76	59	32	44	46	37	33
	R	357	177	45	73	146	94	107	68	115	142	73	76	34	46	27	51	33
Total		714	317	86	148	309	190	210	126	256	267	149	135	66	90	73	88	66

Table 1:2 shows percentage frequency of loop patterns classifed on the roximal & distal sole of hausa ethnic group

	Sample no.		I	I	I^t	I^f	II	II	III	III	IV	IV	V	V^F	V	VI	VI	X^t
Male	L	222	31.5	9.0%	13.5	45.9	20.7	23.4	14.0	38.3	39.2	19.8	15.3	10.8	7.2	7.2	8.6	7.7%
	R	222	41.4	9.0%	14.0	42.8	20.7	24.3	14.0	32.9	36.9	19.4	20.7	10.8	7.2	6.8	13.5	7.2%
Female	L	135	51.9	15.6	33.3	45.2	37.0	37.8	25.9	41.5	28.1	23.7	18.5	14.8	11.9	22.2	13.3	11.9%
	R	135	63.0	18.5	31.1	37.8	35.6	39.3	27.4	31.1	44.4	22.2	22.2	10.0	13.3	8.9	15.6	12.6
Male & Female	L	357	39.2%	11.5	21.0	45.7	26.9	28.9	19.1	39.5	35.0	21.3	16.5	12.3	9.0	12.9	10.4	9.2
	R	357	47.6	12.6	20.5	41.0	26.3	30.0	19.1	32.2	39.8	20.4	21.3	12.9	9.5	7.6	14.3	9.2%
Total		714	44.4%	12.0	6.7	43.3	11.5	29.4	17.6	53.9	37.4	20.9	18.9	12.6	9.2	10.2	12.3	9.2%

Table 1: 3shows the Chi-Square Test Analysis for Loop Patterns On the Left Sole of Hausa Ethnic Group

	Male	Female	Total
Number of sample	(O) 222 (E) 220.50	(O) 135 (E_3) 136.50	357
Mean loop Pattern	(0) 3.12 (E_2) 4.60	(0) 4.33 (E_4) 2.80	7.45
Total	225.12	139.33	364.45

	(0)	(E)	(0-E)	$(0-E)^2$	$\frac{(0-E)^2}{E}$
1.	222	220.5	1.5	2.25	0.0102
2.	3.12	4.6	– 1.5	2.25	0.4891
3.	135	136.50	– 1.5	2.25	0.0165
4.	4.33	2.80	– 1.5	2.25	0.8036
				CHI-SQUARE X^2 =	1.3194

Table 1: Shows the Chi-Square Analysis for Loop Patterns on the Right Sole of the Hausa Ethnic Group

	male	female	total
Number of sample	(O) 222 (E_1) 220.5	(O) 135 (E_3) 136.5	357
Mean loop Pattern	(0) 3.2 (E_2) 4.7	(0) 4.4 (E_4) 2.9	7.6
Total	225.2	139.4	364.6

	(0)	(E)	(0-E)	$(0-E)^2$	$\frac{(0-E)^2}{E}$
1.	222	220.5	1.5	2.25	0.0102
2.	3.2	4.7	– 1.5	2.25	0.4787
3.	135	136.5	– 1.5	2.25	0.0165
4.	4.4	2.9	– 1.5	2.25	0.7759
				CHI-SQUARE X^2 =	1.2813

The percentage frequency of loop patterns in the two sexes differs significantly. There is difference in the percentage frequency of the loop patterns in the right and left soles. The distribution of loop patterns was found greater at the right sole in both sexes, while the percentage frequency of loop patterns was greater in females subjects them in males.

The percentage frequencies of the loops were greatest on the proximal sole and least on the distal sole. It was greatest at the Hallucal area (63%) of female on the right sole. The percentage frequency in both sexes was greatest in female. The percentage frequency was greater also on the right sole in both sexes. Igbigbi et got a similar result when they worked on the Urhobos ethnic group of southern Nigeria.

Conclusion

They appear to be more loops in the female than males in the Hausa ethnic group of Nigeria.

References

1. Cummins, H. & C. midlo. Fingerprints, palms and soles. An Introduction to Dermatoglyphics. Dover publications, New York, USA 1961.

2. Angrosino, M. V. Projects in ethnographic research. Long grove, IL: Waveland press 2004.

3. Bhasin M. K. Genetics of castes and tribes of india: Dermatoglyphics. Int. J. hum. Genet. 2007; 72: 175-215.

4. Blabber W J. Embryologic development of epidermal ridge and their configuration. Birth defects original articles series. 1991; 27(2) 95-112.

5. Chaabani H. and cox D. W. Genetic characterization and origin of Tunisian Berbers. Hum. Hered. 1988; 38: 308-316.

6. Crawford M.H., Duggirala A.R. Digital dermatoglyphics pattern s of Eskimo and Amerindian populations: relationships between geographic, dermatoglyphic, genetic and linguistic distances. Human biology, 1992; 64:683-704.

7. Gupta uk and Prakash S. Dermatoglyphics: a study of finger tips pattern in bronchial asthma and its genetic disposition.kathmandu University medical journal 2003; Vol. 1, No. 4, Issue 4, 267-271.

8. Igbigbi PS, Didia BC. Plantar dermatoglyphic features of the Urhobos of southern Nigeria. E Afr Med J 1999; 77: 12-15.

9. Igbigbi PS, Didia BC, Emenike UJC. Plantar dermatoglyphics in ibos of Nigeria. W Afr J Anat 1996; 4: 44-49.