

DIGITAL DERMATOGLYPHIC PATTERNS OF IGBO TRIBE OF SOUTH EAST, NIGERIA.

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ABSTRACT

Dermatoglyphics is the scientific study of papillary ridges in the palm of the hand and soles of the feet. Digital dermatoglyphics refers to the term fingerprints and everyone possesses a unique set of fingerprints. It has always been of immense importance to forensic scientists, anthropologists and clinicians in respect to genetics in the identification of the ethnicity of a particular individual. This study was carried out to reveal the digital dermatoglyphic pattern of Igbos in South East Nigeria. Fingerprints were taken from 300 subjects (150 males and 150 females) between 15-70 years of age using an ink pad and a plain white A4 paper. The data's were analyzed to derive the percentage and pattern, arch, whorl & radial loop, pattern for the male and female subjects. The result revealed the ulnar loop pattern 66.06% whorl 19.54%, arch 10.40% and radial loop 4.00% in the male subjects

while the females had ulnar loop 61.52%, whorl 15.93%, arch 13.60% and radial loop 8.93%. The mean total finger ridge count (TFRC) of male and females subjects were 90.79 ± 5.48 and 79.25 ± 5.40 respectively though no significant difference was observed. In this study sex dimorphism was observed.

KEYWORDS: Dermatoglyphic, Finger prints, Radical loop, Ulnar loop, Igbos.

INTRODUCTION

Dermatoglyphics is the scientific study of papillary ridges in the palm of the hand and soles of the feet.^[1]

The first classification of finger prints (digital patterns) into arches, loops, and whorls was done by Sir Frances Galton.^[2]

All human possess a unique set of finger prints, knowledge used much by police forces around the world. These patterns do not change. Their use as a means of identification shows how significant they are as a measure of individuality. Anthropometry of the digits, palm and feet provides data that reveals the relative distribution of dermal ridges among people in different geographical zones. Indeed, scientific research has confirmed these patterns do not only have genetic significance but also betray certain distinctive psychological characteristics.^[3]

The role of dermatoglyphics is very important in the diagnosis of chromosomal disorders.^[4] Abnormal dermatoglyphic patterns have been observed in several non-chromosomal and other diseases whose etiology may be influenced directly or indirectly by genetic inheritance. Nearly all chromosomal disorders have been known to show characteristics dermatoglyphic patterns useful in the diagnosis of such disorders.^[5] Through decades of scientific research, the hand has been recognized as a powerful tool in the diagnosis of psychological, medical and genetic conditions. Digital and palmer dermatoglyphic patterns have been shown to be useful genetic markers for certain diseases. Oladipo *et al*^[6,7] studied the dermatoglyphic patterns associated with idiopathic dilated cardiomyopathy and malignant mammary neoplasm in Nigerian patients and concluded that idiopathic dilated cardiomyopathy and malignant mammary neoplasm present characteristic finger print features which can be used as non- invasive anatomical marker for early diagnosis of these diseases.

Hence the aim of this study is to evaluate the dermatoglyphic patterns of Igbo's in South Eastern part of Nigeria.

MATERIALS AND METHOD

Study Population

The study population of this study consists of 300 subjects (150 males and 150 females) of Igbos in South East Nigeria between the ages of 15-70 years for a period of one month.

Experimental Materials

This includes: 300 volunteers from Igbo origin. Endorsing ink and tray ink-stained pad, plain white or A4 paper, hypo super bleach, cotton wool and hand towel.

Inclusion Criteria

The population used in this study includes random selection of young adult Igbo residents in Nnewi between the ages of 15-70.

Exclusion Criteria

Individuals from other tribes were not included in this study. Individuals with signs of hand or finger injury/deformity were not used for the study.

Ethical Committee Approval

Research ethical committee permission relating to the use of human subjects for research purposes was gotten from Ethical Committee, Faculty of Basic Medical Sciences, College of Health Sciences, Nnamdi Azikiwe University, Nnewi Campus before commencement of the study.

Method of Data Collection

The 300 subjects were asked to wash their hands in foamy water and dried with a hand towel. The subjects were made to dip both their right and left hand one after another into a tray ink-stained pad ensuring that the ink covered the entire pattern area. The hands were transferred to a white paper and rolled from side to side across the duplicating paper to obtain the fingerprint. Each sheet of paper was labeled to indicate their age, sex, palm (left or right) and serial number of the digits using roman numerals I-thumb, II-index, III-middle, IV-ring and V- little fingers. The hands were then washed, cleaned and dried up with a hand towel. Screening was done on the white paper containing the prints with the aid of magnifying glass and the different patterns were identified and classified into arches, radial loop, whorl and ulnar loop. Interpretations of the patterns were carried out to achieve the following: the percentage frequency, the pattern frequency, and total finger ridge count and sex differentiation.

RESULTS

Table 1: Pattern Frequency Distribution of Fingerprint Patterns in Males

Pattern Frequency	Arch	Radial Loop	Ulnar Loop	Whirl
Right thumb (R1)	12	4	100	34
Right index (R2)	30	24	54	42
Right middle (R3)	12	5	113	20
Right Ring (R4)	5	0	102	43
Right little (R5)	5	0	129	16
Left thumb (L1)	22	4	97	27
Left index (L2)	35	14	62	39
Left middle (L3)	21	5	99	25
Left ring (L4)	3	4	116	27
Left little (L5)	11	0	119	20
Total	156	60	991	293

Table 2: Pattern Frequency Distribution of Fingerprint Pattern in Females

Pattern	Arch	Radial Loop	Ulnar Loop	Whorl
Right thumb (R1)	13	24	89	24
Right index (R2)	23	15	79	33
Right middle (R3)	25	12	90	23
Right Ring (R4)	26	8	95	21
Right little (R5)	12	13	109	16
Left thumb (L1)	20	18	86	26
Left index (L2)	24	12	81	33
Left middle (L3)	29	9	92	20
Left ring (L4)	19	8	92	31
Left little (L5)	13	15	110	12
Total	204	134	923	239

Table 3: Total finger ridge count in male and female subjects

Finger ridge count	Males (N=150)	Females (N=150)	P-Value
Right thumb (R1)	01.01 ₊ -1.72	9.07 ₊ - 1.52	0.174
Right index (R2)	10.0 ₊ - 1.56	8.29 ₊ - 1.54	0.331
Right middle (R3)	8.53 ₊ - 1.82	8.07 ₊ - 1.44	0.040
Right Ring (R4)	9.92 ₊ - 1.52	7.60 ₊ - 1.63	0.150
Right little (R5)	7.81 ₊ - 1.69	6.53 ₊ - 2.06	0.000
Left thumb (L1)	10.10 ₊ - 1.73	8.91 ₊ - 1.44	0.031
Left index (L2)	8.61 ₊ - 1.73	8.23 ₊ - 1.42	0.075
Left middle (L3)	9.30 ₊ - 1.89	8.01 ₊ - 1.35	0.006
Left ring (L4)	8.64 ₊ - 1.89	7.97 ₊ - 1.58	0.073
Left little (L5)	7.83 ₊ - 1.70	6.55 ₊ - 2.06	0.000
Total	90.79 ₊ - 5.48	79.25 ₊ - 5.40	0.088

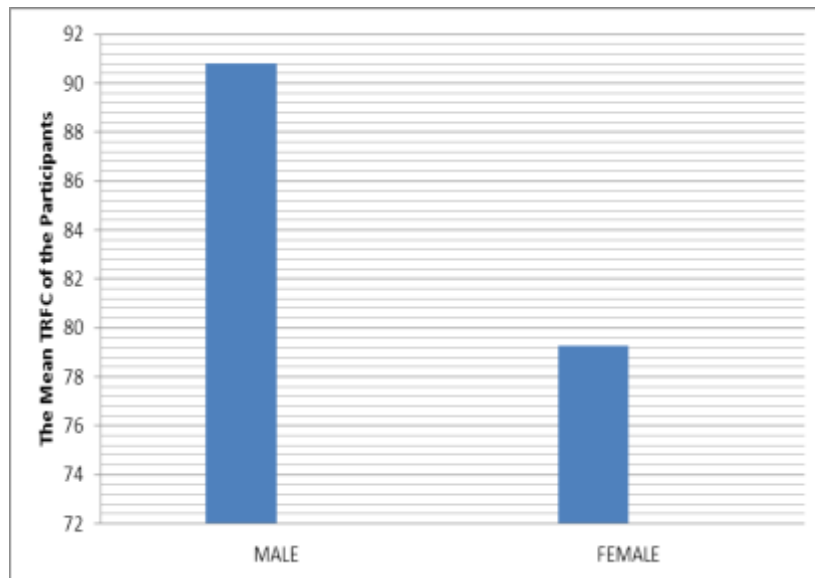


Fig 1. Bar chart showing the mean TRFC of male and female participants

DISCUSSION

Anthropometry refers to the taking of measurements of human body according to standardized units, landmarks and instruments. Anthropometric measurements are usually taken for medical, surgical and dental research and procedures, characterization of dysmorphic syndromes and their correction, forensic identification, industrial design, artistic expression of human body and for military purposes. Anthropometry studies physical variations in man through measurable parameters used to characterize race and tribes.^[8]

The present study obtained the digital dermatoglyphic patterns of Igbos in South East Nigeria. The result showed that the digital dermatoglyphic patterns of this ethnic group are in line with previous studies of other tribes done in Nigeria. In both sex group ulnar loop has the highest percentage and frequency distribution followed by whorl, arch and radial loop. In the previous study done by Udoaka *et al*^[9], the radial loop has the highest frequency, followed by whorl, arch and radial loop in normal subjects. The order of increase is the same in both sex groups.

Also, in the present study, the ulnar loop occurred more frequently on the little finger in both sex groups, the whorl occurred more on the index finger for females but for males, it occurred on both the ring and the index finger for right and left hand respectively while the radial loop and arch was more common on the index fingers for males and radial loop on the thumb, and arch on right ring and left middle fingers for females.

In contrast with the work by Udoaka *et al* ^[10], which showed that the males had a higher percentage of ulnar loop pattern and arch pattern while the females had higher percentage in whorl pattern and radial loop? The pattern and percentage frequency of Igbos in South East Nigeria showed a higher pattern and percentage frequency distribution of ulnar loop and whorl in male than female subjects, then a higher arch and radial loop pattern and percentage frequency distribution was observed in female than in male.

From the present study, the males demonstrated higher mean total finger ridge count than the females. The individual total finger ridge count for females were in the range of 70 – 90 for individual left and right palmar digits while the total finger ridge count of the male were in range of 80 – 105 for individual left and right palmar digit.

The sex dimorphisms for pattern types in also recorded in the present population in the total finger ridge count as the mean total finger ridge count in males and females are 90.79+- 5.48 and 79.25+- 5.40 respectively.

Sex dimorphism was also confirmed by Padmaja^[12] as the finger pattern intensity index showed higher mean value for the males (14. 73+- 0.29) than the females (13.50+- 0.28). The pattern symmetry also showed much difference as the males dominated in the ulnar loop and whorl pattern while the females dominated ion the arch and radial loop pattern.

CONCLUSION

This study has shown fingerprint patterns among Igbos in South Eastern part of Nigeria. The finger print patterns of Igbos in South East Nigeria are normal and share a close similarity with those of the other ethnic groups in Nigeria and also of Africans. The digital variables of arch whorl, loops and TFRC were distinct in each individual. No two fingerprints were exactly the same as seen by this study corroborating with all the earlier studies. Hence they may be useful as means of identification.

REFERENCES

1. Purkinye L.E. Physiological Examination of the Visual Organ and of the cutaneous system Bresua: viatisaviae Typis Universities American Journal of Criminal Law Criminology, 1823; 13: 343-356.
2. Galton F fingerprints, London Macmill and Co: 1892, Pp. 275-283.

3. Blue J, Candela P, Grother R, Chellapa R, Wilson L. Evaluation patterns classifiers for fingerprints and OCR Applications Pattern Recognition, 1994; 27(4): 485-501.
4. Holt S.B, Lindsterm J. Dermatologyphics in Turners Syndrome Ann. Hum Genet, 1964; 28:87-94.
5. Schauman B, Alter M Dermatology phics in Medical Disorders Springer Verlay Publication: 1976, Pp. 146- 203.
6. David J Dermatology Analysis of 50 Nigeria Cases with congenital Heart Diseases. Journal of Medical Genetic, 1981; 18: 344-349.
7. Oladipo GS, Paul CW Bob-Manuel IF, Fawehinimi HB, Okoh PD, Iboroma AD. Dermatoglyphics in Idiopathic (Primary) Dilated Cardiomyopathy in South Southern Nigeria; Scientific Research and Essay, 2007; 2(10): 416-420.
8. Oladipo GS, Olotu EJ, Fawehinimi HB, Edibamode EI. Anthropometric Comparism of Nasal Indices between Andoni and Okrika Tribes of Rivers State, Nigeria; International Journal of Medicine and Medical Sciences, 2009; 1 (4): 135-137.
9. Boroffice R, Down's syndrome in Nigeria: Dermatology Analysis of 50 Cases Nigerian Medical Journal, 1978; 8: 571-576.
10. Oguranti I (1984) Dermatology study of the southern Nigeria Population of Ogoni people of River State <http://www.fingerprints.com/wns/Pp14>
11. Udoaka A, Alaba E Digital Dermatology phics in Ijaw students of University of Port Harcourt, Nigeria, Continental J Biomedical Sciences, 2009; 3:1-5.
12. Ponchekina E, Benfer R, Verbioubskaya A, Kozlov A. Genetic and Environmental influence on symmetry on Dermatologyphics in Traits Am .J. Anthropol III, 2000; (4): 531-43.