

A STUDY ON THE DERMATOGLYPHIC PATTERNS OF OKRIKA AND IKWERRE ETHNIC GROUPS OF NIGERIA

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ABSTRACT

This study was carried out to compare the dermatoglyphic patterns of Okrika and Ikwerre ethnic groups. Dermatoglyphic analysis of five hundred and ten (510) subjects comprising of two hundred and seventy nine (279) Okrika indigenes and two hundred and thirty one (231) Ikwerre indigenes between the ages of 15- 70 years was carried out. The sample population was drawn at random from the University of Port Harcourt and National Secondary School Okrika. The parameters studied are the digital pattern, atd and dat angles. The result revealed that the ulnar loop had the highest occurrence, followed by the whorl, arches and radial loops. The percentage frequency distribution of the digital pattern of the ulnar loop for Okrika was 46.42%, whorl 37.77%, arch 14.12% and radial loops 1.71% while for Ikwerre the ulnar loop was 56.46%, whorl 24.42%, arch 15.89% and radial loop 3.23%. The pattern intensity index for Okrika was 11.69 while that of Ikwerre was 10.91. The mean atd angle for Okrika was 43.98 for the left hand and 43.75 for the right hand while for Ikwerre was 42.68 for the left hand and 41.69 for the right hand. There was no significant difference ($P>0.05$) in the digital pattern and atd angles between the two ethnic groups. The mean of the dat angles for Okrika was 60.36 for the left hand and 60.33 for the right hand. That of Ikwerre was 57.41 for the left hand and 57.76 for the right hand. There was however a significant difference between the dat angles of both ethnic groups ($P<0.05$). The digital pattern, whorls, ulnar and radial loops are important features for identification and forensic investigations of ethnic groups.

Key words: Dermatoglyphics, Okrika, Ikwerre.

INTRODUCTION

Dermatoglyphics is the scientific study of papillary ridges in the palm of the hand and soles of the feet (Purkinje 1823). The first classification of finger prints (digital patterns) into arches, loops and whorls was done by Sir Francis Galton (Galton 1892). Although the arrangement of skin ridges is never duplicated in two persons even in monozygotic twins, the similarities are closer among some individuals while in others the differences are marked, but

in spite of their peculiarities in arrangement all have certain likeness. Murad (1969) reported dermatoglyphic studies in the variations of the palm of 768 Eskimos. He found out that a C-line terminates more proximally on the ulnar margin of the left hand than the right hand. Ogunrati and Sorgia (1984) carried out a study on the dermatoglyphic pattern in the Southern Nigeria population of 859 people of Bodo city. Their results revealed that whorls had highest percentage frequency followed by

ulnar loop, arch and radial loop while *atd* angle was within normal range. Barta et al (1978), Shield et al (1995), Oladipo et al (2004) reported dermatoglyphic correlation in diabetics mellitus. Nearly all chromosomal disorders have been known to show characteristic dermatoglyphic patterns useful in the diagnosis of such disorders (David 1981). It is postulated that the first appearance of the ridges is on the distal segments of the finger while the sole is the last region to differentiate in accordance with the principle of cranio-caudal development (Cummins, 1943). The initial phase of ridge alignment is the most critical since the patterns established undergo no further alteration throughout life (David 1981). Since widespread dermatoglyphic variations exists between ethnic group, there is the need to determine the dermatoglyphic patterns of Okrika and Ikwerre ethnic groups of

South-Southern Nigeria in order to determine the parameters to be used in the identification of each of these ethnic groups.

MATERIALS AND METHODS

A total of 510 subjects which comprised of 279 Okrika indigenes and 231 Ikwerre indigenes between the ages of 15-70 years, chosen at random were used for this study. University of Port Harcourt constituted the sample population for the Ikwerre indigenes while the sample population for Okrika indigenes was drawn from National Secondary School, Okrika. The subjects were not grouped into males and females since sexual differences in dermatoglyphics are known to be less significant in ethnic considerations (Wertelechi,1991). The finger was cleaned with cotton wool, washed in foamy water and dried with a hand towel. The subjects were made to roll the tip of their fingers and thumb one after the other from side to side across the

surface of an already made ink-stained pad, ensuring that the ink covered the entire pattern area. The finger was then transferred to a white paper and rolled from side to side across the duplicating paper to obtain the print. Each sheet of paper was labeled to indicate the serial number of the digit using the roman numerals I- thumb; II- index; III- middle; IV- ring and V- little fingers respectively. Palmar prints were also obtained by placing the palm of the subjects on an ink pad whose size is big enough to accommodate the palm. The subjects then made an impression on the white paper, starting with the proximal part of the hand, lowering it until the digits came in contact with the white paper (Oladipo and Akanigha, 2005). The palm was firmly pressed to ensure that the centre was printed as well as the digits. The palms were then cleaned, washed and dried with a hand towel. The result was analyzed statistically using students' *t* and chi-square tests and data compared.

RESULTS

Table 1 showed the percentage frequency distribution of digital patterns in Okrika and Ikwerre populations. The ulnar loop for Okrika population was 46.42%, whorl 37.77%, arch 14.12% and radial loop 1.71%. The Ikwerre population had the ulnar loop of 56.46% which was higher than that of the Okrika population, whorl 24.42%, arch 15.89% and radial loop 3.23%. Tables 2 and 3 showed the frequency distribution of digital patterns in Okrika and Ikwerre populations respectively. The pattern intensity index was calculated as the total number of triradii/sample size. The pattern intensity index for Okrika was 11.69 while that of Ikwerre was 10.91. There was no significant difference ($P>0.05$) in the pattern intensity for both ethnic groups. The mean *atd* angle for Okrika was 43.98 for the left palm and 43.75

for the right palm while those of Ikwerre were 42.68 and 41.69 respectively. There was no significant difference ($P>0.05$) in the digital pattern and *atd* angles between the two ethnic groups. Table 4 shows the mean *atd* and *dat* angles in both Okrika and Ikwerre population.

The mean of the DAT angles for Okrika was 60.36 for the left and 60.33 for the right palm while those of Ikwerre were 57.41 and 57.76 respectively. There was a significant difference ($P<0.05$) between the *dat* angles of both ethnic groups.

Table 1. Showing percentage frequency distribution of digital patterns in Okrika and Ikwerre populations.

	Ulnar loop	Whorl	Arch	Radial loop
Okrika				
Percentage %	46.42	37.77	14.12	1.71
Ikwerre				
Percentage %	56.46	24.42	15.89	3.23

$P> 0.05$

Table 2; Frequency distribution of digital patterns in Okrika population.

Patterns	LEFT HAND DIGITS					RIGHT HAND DIGITS				
	LV	LIV	LIII	LII	LI	RI	RII	RIII	RIV	RV
Ulnar loop	189	135	129	90	87	72	75	132	120	195
Whorl	57	114	84	123	114	138	117	72	126	51
Arch	15	12	48	51	57	51	57	54	12	15
Radial loop	3	3	3	3	3	3	15	3	6	3

Table 3; Frequency distribution of digital patterns in Ikwerre population.

Patterns	LEFT HAND DIGITS					RIGHT HAND DIGITS				
	LV	LIV	LIII	LII	LI	RI	RII	RIII	RIV	RV
Ulnar loop	201	132	120	81	72	102	102	147	153	201
Whorl	27	75	51	66	81	90	54	39	66	18
Arch	3	24	54	63	75	36	54	45	12	3
Radial loop	3	3	3	21	6	3	21	0	6	9

Table 4: Mean atd and dat angles (°) of Okrika and Ikwerre ethnic populations.

Okrika		Ikwerre	
Left hand	Right hand	Left hand	Right hand
Mean (ATD) 43.98	43.75	42.68	41.69
Mean (DAT) 60.36	60.33	57.41	57.76

DISCUSSION

The data obtained in the present study on the dermatoglyphic patterns of the Okrika and Ikwerre population is in line with what have been obtained in previous studies. The variables implicated with dermatoglyphic correlation include digital patterns, atd angle, dat angle, digital ridge count and palmar crease pattern (Schaumann and Alter, 1976; Borroffice, 1978; Penrose, 1965; Shield et al, 1995; Oladipo et al, 2005). In both ethnic groups, the highest percentage 42.46% in okrika population and 56.46% in Ikwerre population, this was higher in ikwerre than okrika population. Though this little difference in value occurred, it not statistically significant. This was followed by whorl, arch and radial loop confirming the studies carried out by Cummins, 1926; Borroffice, 1978; Ogunrati, 1984 in which they stated that the ulnar loop has the highest frequency of occurrence followed by whorl, arch and radial loop in normal subjects. The order of increase is the same in both ethnic groups. The ulnar loop occurred more frequently on the little finger in both ethnic groups, the radial loop occurred more on the index finger while the whorl and arch was more common on the thumb and index fingers. There was absence of simean crease in all the subjects that participated in this study. It was observed that there was no significant difference in the position of axial triradius between both ethnic

groups. All the subjects had their axial triradii at the position T.

However, in the dat angles, it was observed that there was a significant difference in both ethnic groups when compared statistically ($P < 0.05$). Since dermatoglyphic variables have been shown to have ethnic and racial variations (Harich et al, 2002; Kusuma et al 2002; Igbigbi and Msamati, 2001; Oladipo and Akanigha, 2005) the difference in dat angles can be deduced to be as a result of variations in ethnicity.

This study has given an insight into the finger and palmer print patterns predominant in Okrika and Ikwerre populations in the south- southern part of Nigeria. This analysis could be of immense importance to forensic scientists, anthropologists and clinicians in respect to genetics in the identification of the ethnicity of a particular individual and criminal investigation.

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