ASSESSMENT OF DERMATOGLYPHIC PATTERNS IN POST PRIMARY SCHOOL STUDENTS IN ABAKAL1KI EBONYI STATE NIGERIA

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Abstract

The finger print ridge count for ail of a person's fingers provides an excellent example of polygenic inheritance that is largely unaffected by environmental factors. The number of finger print ridges is "fixed" at about the twelfth week after conception. There are three basic patterns of ridge development: the Arch, the loop, the whorl and the compound. In this investigation it was observed that out of five hundred (500) students studied 174 (34.8%) were males while 326 (65.2%) were females. Relative frequency distribution of the respective finger prints had for males 15 (8.6%) for Arches; 97 (55.7%) for loops 49 (28.2%) for whorls and 13 (7.5%) for compound. In females: 16 (4.9%) are for Arches; 182 (55.9%) for loops; 85 (26.1%) for whorls and 43 (13.2%) for compound. The two patterns of loop finger print distribution had for ulna loop in males 95 (54.6%) and radial loop 79 (45.4%). In females ulna loop had the distributions 228 (69.9%) against Radial loop of 98 (30.1%). The Average Ridge Count (ARC.) for both Males and Females were recorded at!31 and 125 respectively. From the result of this investigation it is recommended that for crime detection and in forensic medicine care should be taken while assessing finger prints of people suspected to belong to the arches and loops as certain features of the two are somewhat striking.

Introduction

The finger prints of different individuals are different from one another. Okeke (1990) qualified finger prints as the pattern of ridges on the end of the finger and thus classified them according to the Henry System into four main groups called Arches, loops, whorls and compounds. The finger print count is made from the triradius to the centre of the pattern. Carter, (1969) observed that the number of finger print ridges is "fixed" at about the twelfth week after conception. The Arch appears to be the simplest of the patterns.

The arch is formed as the ridge arches upward near the centre of the finger. Stine (1954) reported that approximately 5% of all finger tip dermatoglyphic patterns are arches. The loop, forms, as ridges go to the centre and loop back to the edge. Approximately 65% to 70% of all finger tip patterns are of the loop type. The whorl pattern is circular in appearance and spreads out from the centre of the finger tip. It is also on approximation that 25% to 30% of all finger tip patterns are of the whorl type (Deaton, 1974). Deaton suggested methods to obtain the number of ridges on finger lips. This is by drawing a line from each triradius, which is the point where the ridges of the loop or whorl interrupt ridges from the opposite sides of the finger to the centre of the loop or whorl. Arches themselves do not cross ridges and therefore do not give ridge counts. To count the total ridge count, the ridge count for all the fingers should be counted. In females the average ridge count is 127 and in Men 144.

Deaton *et* a/ (1974) report that finger print patterns, palm print patterns and sole print patterns are associated with the expression of various inherited diseases. For example, palm and sole patterns are associated with the chromosome disorder causing Down’s syndrome. In about half the Downs children, there is the simian crease. Stine (1977) noted that most patients suffering from Down's syndrome have ulnar loops triradius and that a number of single gene disorder have a characteristic dermatoglyphic pattern.

Purpose of Study -

The aim of this study was to ascertain the finger print distribution among the post primary Students of, ten (10) secondary schools in Abakaliki urban of Ebonyi State of Nigeria. The investigation was structured to further ascertain if the dermaloglyphic distribution is similar to the findings of Deaton (1974) Okeke (1990) and ikeh (1993). If the findings are synchronized it will however be a basis For a quick pointer to the prevalence pattern in a given community, thus narrowing down the errors associated with quick and urgent dermatoglyphic detection in criminal cases. More so, it will be a guide for further research into the polygenic or multifactoral inheritance and other areas of classical genetics as it pertains to Down's, Klinefelter's and Turner's syndrome.

Materials and Methods

A population size of five hundred students were sampled for this investigation. Fifty students per school were randomly selected using a secret ballot paper system of "YES" and "NO" The students that picked "YES" made up the population sample of this research. Respective finger prints of the students were collected using an ink pad and plain white sheets ruled 2 cm squarely all over one side of the paper. The papers were designated for males and females. The thumb was used to press on the ink pad with, reasonable pressure and afterwards pressed into the 2 cm square provided in the white sheets. Care was taken to ensure that it does not cross over to the next square. Observed crosses were disregarded during analysis. In the analysis of the samples a "X10" magnifying lens was used to trace the finger print ridges and thus classified them accordingly based on the Henry system. The ridgc count was made by counting from the centre of a whorl to a triradius. As whorls usually have two triradii, the highest of the two counts was taken. To ascertain the total ridge count, all the ridge counts of the total fingers were counted using the Dermatoglyphic ridge pattern formular of John Deaton for approximation :

Where

TRC = 5 (HRC-i-LRC)

TRC - Total Ridge count HRC - Higher Ridge count . LRC - Lower Ridge count For the pentadactyl limb indicating the thumb and the four fingers.

5

Average Ridge count (ARC) was worked out using the formular

ARC = x(J) + ...xn

\- N

Result

Table 1 Distribution of Dermatoglyphic Patterns Among the Males Sampled.

Finger print	Arches (A)	Loop (L)	Whorl (W)	Compound (c)	Total
Distribution.	**15**	**97**	**49**	**13**	**374**
%agc dist.	**8.6%**	**55.7%**	**28.2%**	**7.5%**	**100%.**

Table 2 **Distributions of Dermatoglyphic Patterns for Females Sampled.**

Finger print	Arches (A)	Loop (L)	Whorl (WL	Compound (c)	Total
Distribution.	16	182	85	43	326
. %agc dist.	4.9%	55.8%	26.5%	13.2%	100%

Table 3 **Distribution of Dermatoglyphic Loop in both Males and Females Sampled.**

	Dist. in males	%	Dist. in females	%	Total
Ulna loop	95	54.6%	228	69.9%	323
Radial loop	79	45.4%	98	30.1%	177
Total	174	100%	326	100.00%	500

Table 4 Combined Percentage Distribution of Dermatoglyphic Patterns in both Males and Females Studied.__ Arches

F		%	Loop	%	Whorl	%	Compound	%	Total	%
	15	48.4%	97	34.8%	49	36.6%	13	23.2%	174	34.8%
	16	51.6%	182	65.2%	85	63.4%	43	76.8%	326	65.2%
	31	100%	279	100%	134	100%	56	100%	500	100%

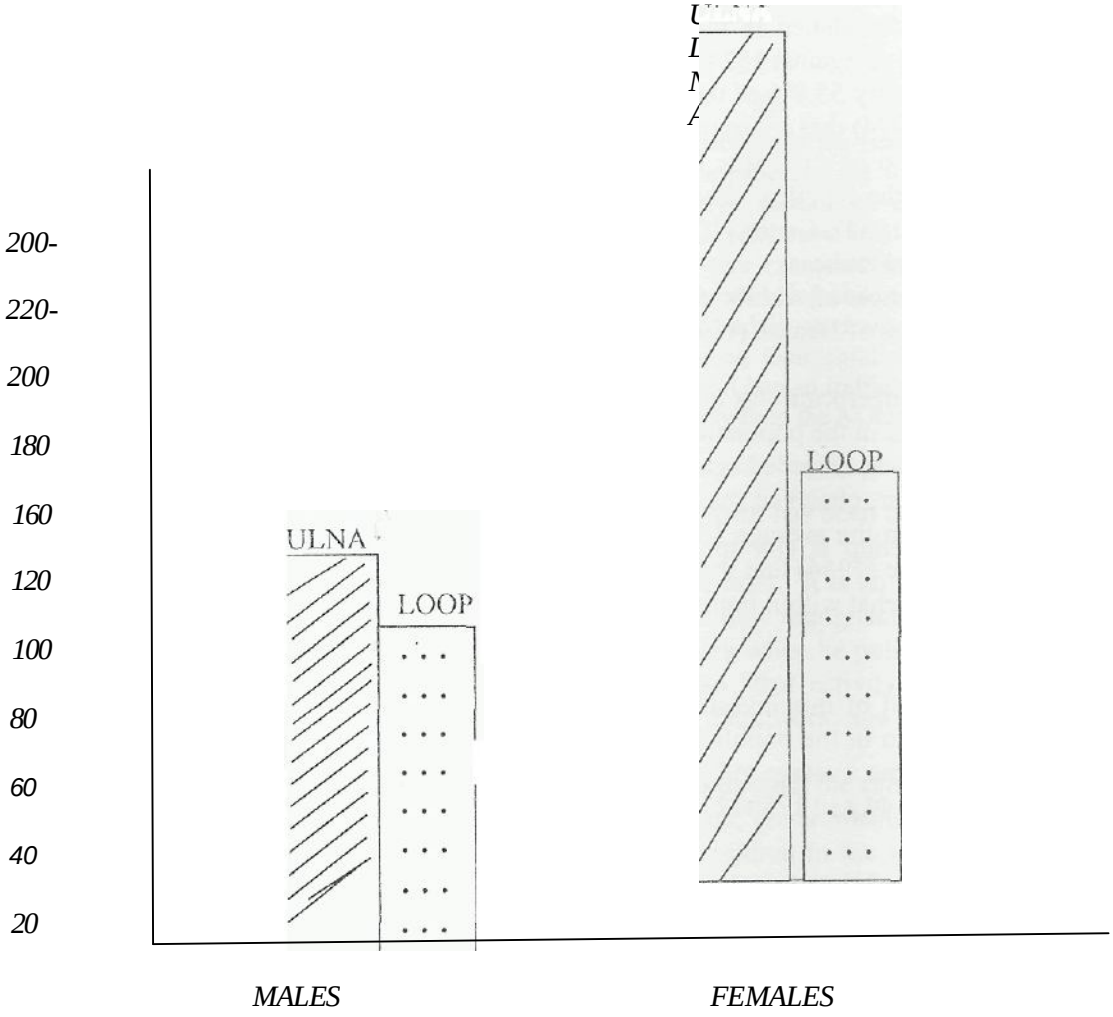
Table 5

Males (M)	Higher Ridge Count HRC	Lower Ridge Count LRC	Total Ridge Count TRC	Females (F)	Higher Ridge Count HRC	Lower Ridge Count LRC	TRC
M(i)	21	9	150	F(i)	17	09	125
M(ii)	16	11	135	F(ii)	16	09	125
M(iii)	14	8	110	F(iii)	18	08	130
M(iv)	17	10	135	F(iv)	17	09	130
M(v)	20	9	145	F(v)	15	09	120
M(vi)	19	10	145	F(vi)	17	08	125
M(vii)	15	10	125	F(vii)	17	10	135
M(viii)	14	9	115	F(viii)	16	08	120
M(ix)	18	8	130	F(ix)	16	08	120
M(x)	16	8	120	F(x)	15	09	120

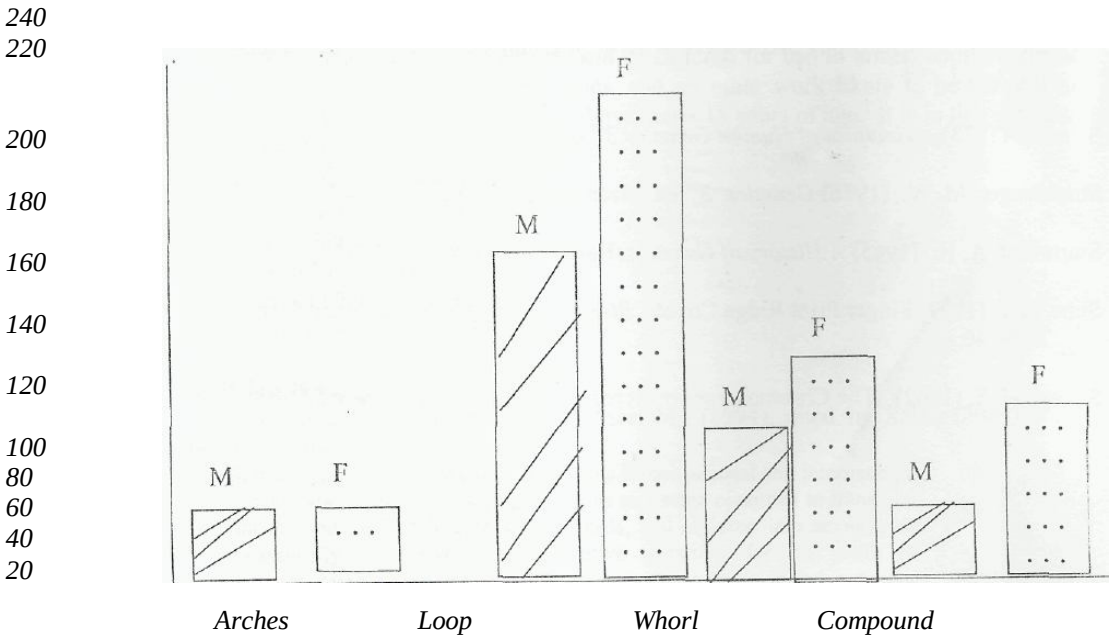
Average Ridge Count (ARC) - 131 and 125 respectively for both Male and Females sampled.

$$ARC = \frac{M(i) + M(ii) \ldots\ldots + M(n)}{N}$$

*Fig. **1: Distribution** of Ulna and Loop Patterns in Both Males and Females.*



Distribution of Dermatoglyphic Patterns in the Student Population Sampled



Discussion

From the results of this investigation it was discovered that the four Henry sys'em of finger print distribution are distributed in the population studied. The percentage distribution of loop in males was 97 (34.8 %) as against 182 (65,2 %) of females. The loop appears to be more distributed in the population as virtually 55.8% of the populations sampled are of loop origin. This partly supports the work of Deaton (1974) that approximately 65 % of all finger print pattern are of the loop type.

The distribution of Arch was least in the population studied as male showed 15 (48.4%) as against J6(51.6%) of the females. This result indicated only 7.6 % distribution. This confirms the observation of Stine (1964), Carter (1969) and Deaton (1974) that approximately only about 5 % of all fingertip patterns are arches.

In the distribution of whorls only 26.8 % of the population exhibited whorl patterns. This agrees with the findings of Deaton (1974) that 25 % to 30 % of all fingertip patterns are of the whorl type.

As the loop fingerprint was observed more prevalent further investigation showed that ulna loop is more distributed in the population studied as 326 (65.2 %) of ulna loop was recorded against 174 (34.8%) of Radial loop.

It was, however, observed that the Dermatoglyphic ridge count of 10 samples each of males and females showed on the average 131 for males and 125 for females. This had a slight deviation from the report of Stine (1954) that the Average ridge count (ARC) in males is 144 and females, 127. The disparity is somewhat within limits.

From the result of this investigation, It has been deduced that Loops is the most prevalent Dermatoglyphic pattern in the population studied, followed by Whorl and the least is Arch. It was also made clear that the average ridge count of the fingers for both Males and Females is In the neigbourhood of 131-144 and 325-127 respectively.

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