Journal of Biology, Agriculture and Healthcare
ISSN 2224-3208 (Paper) ISSN 2225-093X (Online)
Vol.4, No.16, 2014
www.iiste.org

Volar Digital Transverse Creases of the Nigerians

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Abstract
The volar transverse creases of the second to fifth fingers have been shown to be genetically influenced and not caused primarily by embryonic flexion movements. The presence of extra, displaced and missing volar digital transverse creases in individuals with normal joint anatomy may reveal abnormalities.
This study aims at documenting the prevalence patterns of volar digital transverse creases of digits II-V in the normal Nigerian hands.
Volar digital transverse creases of the digits II-V of 303 male and 168 female Nigerians were studied using palm prints obtained by ink method.
Single crease (M) had highest frequency in the distal crease, followed by proximal crease and then middle crease. Double crease (D) frequency was highest in the middle phalanx, followed by proximal crease and then distal crease. Triple (T) frequency was highest in the middle phalanx; it was not common in the proximal and distal phalanx. Frequency of E and E^+ creases were common in the middle phalanx, followed by distal phalanx and less common in the proximal phalanx.
No differences exist between male and female digital creases of Nigerians, there is reduced frequency of the crease types T, E and E^+ in all the fingers of male and female, and the male fingers II-IV showed absent E and E^+ in the proximal phalanx.
Keywords: Digital, Transverse, Creases, Nigerians.
Published: July 31st, 2014

Introduction
The dermatoglyphic ridges of the anterior (palmar or volar) of the fingers are interrupted by three transverse creases on digits II to IV and two transverse creases on digit V. These transverse creases are misnormally referred to as digital flexion creases, though embryological strong evidence revealed that these volar digital transverse creases are not caused primarily by embryonic flexion movements (Wurth, 1937, Aue-Hauser, 1979 and Okijama, 1980). The presence of extra, displaced and missing volar digital transverse creases in individuals with normal joint anatomy and unusual volar digital transverse crease variants in a number of syndromes indicate that genetic factors were involved in the formation of these creases. Supernumerary volar digital transverse creases had been reported in Allagile syndrome (Binita et al., 2002), foetal alcohol syndrome (Jones and Smith, 1973), partial deletions of chromosome 1q (Watson, et al., 1986), cerebro-oculo-facio-skeletal syndrome (Lurie et al., 1976). Okajima (1967) proved high heritability of metacarpophalangeal transverse volar creases.
This study aims at documenting the prevalence patterns of volar digital transverse creases of digits II-V in the normal Nigerian hands with the exception of the digit I (thumb) because of its different anatomy.

Materials and Method
Hand prints were taken randomly by ink from 303 male and 168 female Nigerians of 18 to 80 years of age. Prints that clearly revealed (proximal) metacarpophalangeal transverse creases, (middle) interphalangeal creases and distal interphalangeal creases were used and classified according to Aue-Hauser et al (1980) as **mono (M)** if a single crease is at the normal site, **double** (D) if two creases is at the normal site and **triple (T)** if three creases is at the normal site. **Extra** (E) crease is defined according to Dejong and Platou (1967) and Aue-Hauser et al (1980) as crease that is separated from the usual interphalangeal creases by two or more epidermal ridges and the crease must not connect the usual interphalangeal crease.
The **Extra+** (E^+) crease is the extra crease variation that is lying approximately in the middle of the phalanx.

Results and Discussion
Table I and Fig II show the frequency distribution of the types of creases on the proximal, middle and distal phalanges of the fingers II – IV. Single crease (M) had highest frequency in the distal crease, followed by proximal crease and then middle crease.
Double crease (D) frequency was highest in the middle phalanx, followed by proximal crease and then distal crease. Triple (T) frequency was highest in the middle phalanx; it was not common in the proximal and distal phalanx. Frequency of E and E^+ creases were common in the middle phalanx, follow by distal phalanx and less common in the proximal phalanx.
All the types of crease show higher frequencies in the male than female in the middle phalanx followed by distal phalanx and less common in the proximal phalanx.
There are no patterns differences in both right and left hand, both single and double creases tend to be more frequent in both hands and all the fingers contrary to Aue-Hauser et al (1980) which revealed that low numbered creases (M and D) tend to have higher frequencies in the proximal phalanx in comparison of crease forms of Japanese and Vietnamese. No obvious pattern differences exist between male and female digital crease pattern of Nigerians, except reduced frequency of the crease types T, E and E^+ in all the fingers of male and female, although the male fingers II-IV showed absent E and E^+ in the proximal phalanx.
Conclusions: Comparison of male and female single fingers revealed tendency of male to have higher frequencies of all the form of creases and this is found in both right and left hands of Nigerians.
It will be of interest in future analysis to evaluate the form of creases in different ethnic populations for identifications and medicolegal applications.

Table I Frequencies of creases for each phalanx in male and female Nigerians

Finger		II R	II L	III R	III L	IV R	IV L	V R	V L
Distal phalanx crease(DP)	M ♂	128	124	128.5	120.5	128.5	117	121.5	115
	M ♀	59.5	57.5	57	54	60.5	53	59	50.5
	D ♂	3	5.5	3	6.5	2.5	11	4	9.5
	D ♀	5.5	8.5					7.5	22.5
				8	12	3.5	11.5		
	T ♂	-	-						
	T ♀	0.5	-	-	0.5	-	1	-	0.5
				-	-	-	-	0.5	-
	E ♂	3	1.5						
	E ♀	1	2.5	7	6	4	2	0.5	0.5
				4	4.5	2.5	3.5	2.5	1
	E^+ ♂	2	3.5						
	E^+ ♀	1	1	3	4	3	6	1	1.5
				2	3.5	2	3	0.5	1
Middle phalanx creases(MP)	M ♂	23	23 12.5	23.5	22.5	20.5	16	20.5	14.5
	M ♀	12.5		16	14.5	10.5	9.5	9.5	8.5
	D ♂	104	98	100.5	96	103	98	103.5	99
	D ♀	48	40	47.5	34.5	43	38.5	46.5	39.5
	T ♂	3	6	5	9.5	5	9	5	11
	T ♀	4	9	5	10	7.5	12.5	6.5	11.5
	E ♂	13	18	20	24.5	14.5	18.5	7.5	7.5
	E ♀	9.5	11	16.5	5	12.5	8	3	5.5
	E^+ ♂	19.5	14	16	23.5	18.5	23.5	3	4
	E^+ ♀	11.5	8.5	12	16	10	15.5	2	4
Proximal phalanx creases(PP)	M ♂	88	83	40	39.5	53	38.5	69	53.5
	M ♀	35	35.5	16.5	18	17.5	13.5	25.5	24.5
	D ♂	13.5	12.5	21	20	25	25.5	22	32
	D ♀	13	16	15.5	17.5	23.5	23	24.5	22
	T ♂	-	-	-	-	-	-	-	0.5
	T ♀			1	1.5	1.5	3.5	1	1.5
		2.5	0.5						
	E ♂			-	1	-	0.5	1	0.5
	E ♀	-	-	1	1.5	0.5	-	1	1.5
	E^+ ♂	0.5	0.5	-	1.5	-	1	-	1
	E^+ ♀			0.5	-	0.5	-	-	1
		-	-						
		-	0.5						

Fig I

TYPES OF CREASE ACCORDING TO THE CLASSIFICATION

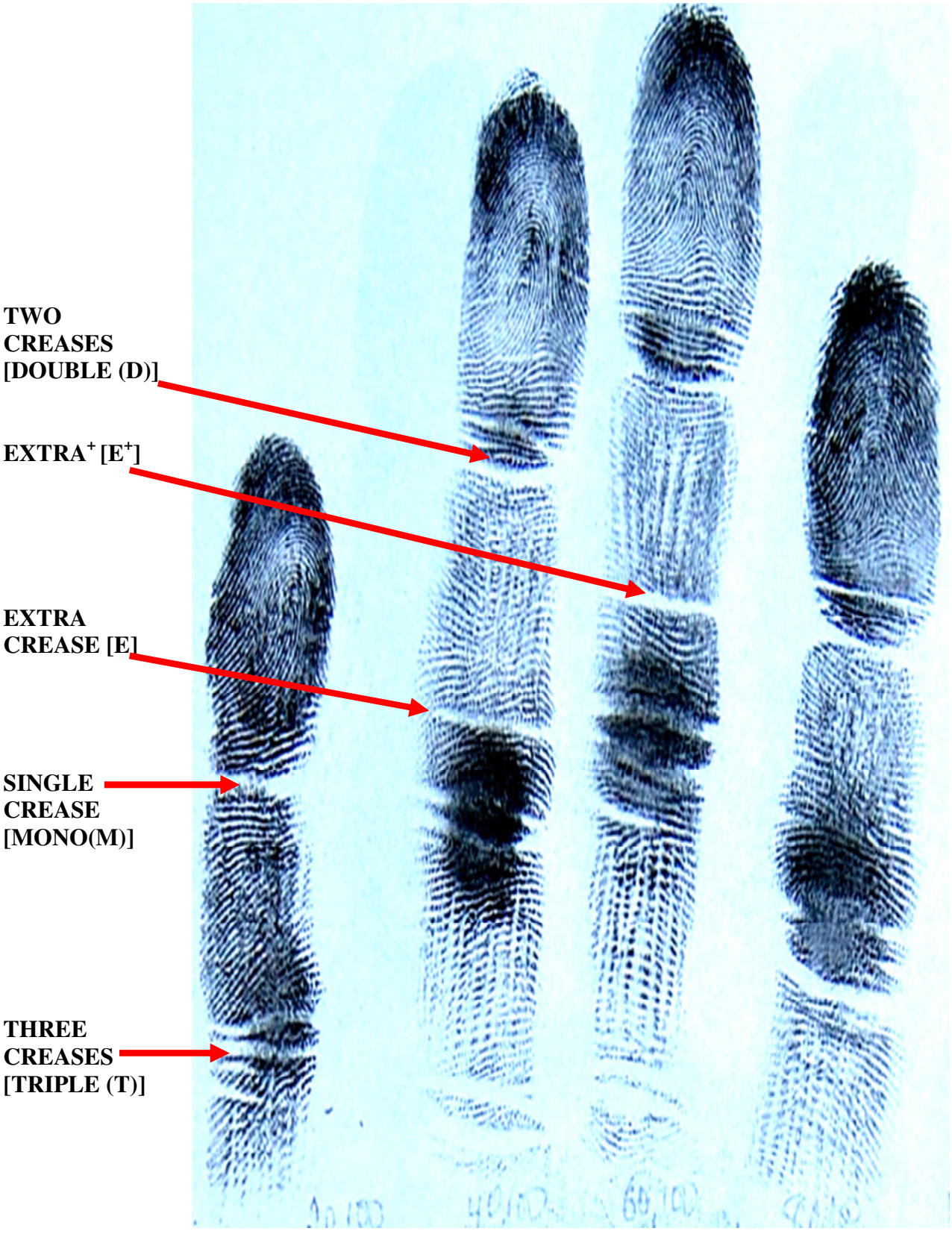
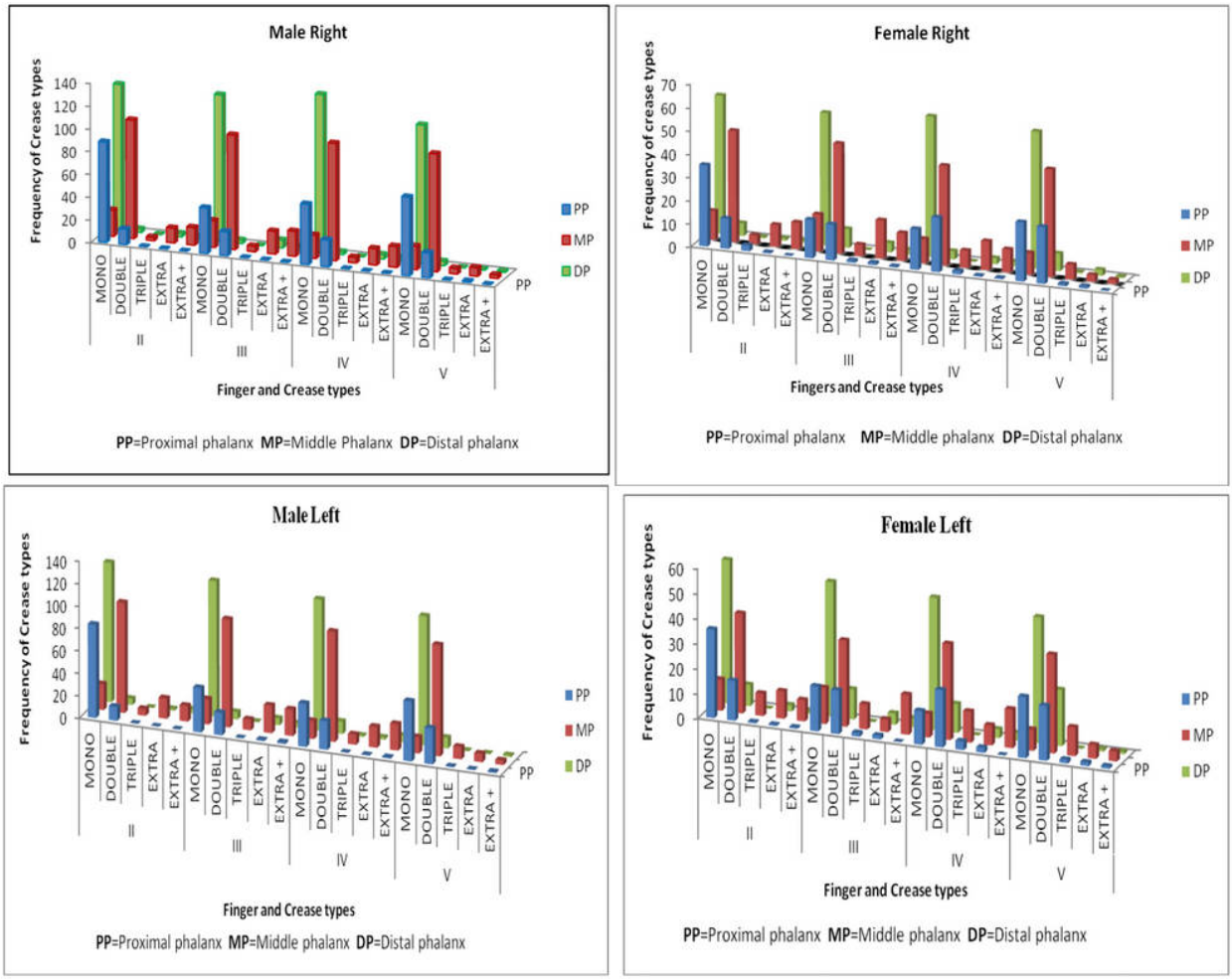


Fig II

Frequency of the Crease types of phalangeal lines of the fingers of Nigerians



References

Aue-Hauser G. (1979), Magna Brush technique in dermatoglyphic research. Amer. J. Phys. Anthrop., 51:97

Binita M. Kamath, Kathleen M. Loomes, Rebecca J. Oakey and Ian D. Krantz. (2002), Supernumerary digital flexion creases: An additional clinical manifestation of Alagille syndrome. American Journal of Medical Genetics 112:171-175.

Dejong R. and Platou R.V. (1967), Sickle cell hemoglobinopathy. Amer. J. Dis. Child., 113:271-273.

Jones KL, Smith DW. 1973, Recognition of the fetal alcohol syndrome in early infancy. Lancet 2:999-1001.

Lurie IW, Cherstvoy ED, Lazjuk GI, Nedzved MK, Usoev SS. (1976), Further evidence for the autosomal recessive inheritance of the COFS syndrome. Clin Genet 10:343-346.

Okajima. (1967), Metacarpophalangeal and ring creases in twins. Amer. J. Phys. Anthrop., 25:349-356

Watson MS, Gargus JJ, Blakemore KJ, Katz SN, Breg WR. (1986), Chromosome deletion 1q42-43. Am J Med Genet 24:1-6.

Wurth A. (1937), Die Entstehung der Beugefurchen der menschlichen Hohlhand. Z. Morph. Anthrop., 36:187-214.