

DERMATOGLYPHICS IN DARIER'S DISEASE

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Summary

9 cases of Darrier's disease were studied. All probands showed typical clinical lesions of Darier's disease. The clinical diagnosis was confirmed by histopathological study. Study of palmar dermatoglyphics by the standard Ink and Roller method revealed certain characteristic features. Whorl pattern was the predominant finger tip pattern observed in both sexes. Ridge dissociation, wide flexion creases, white lines and white dots were the main features found in those cases. Sydney line and extra digital transverse crease were also observed. The finger tip pattern in female probands was found to be statistically significant when compared with that of controls. As significant dermatoglyphic findings have been observed in the present study, an analysis of the palmar dermatoglyphics can be used as an important tool of significance in the study of Darier's disease.

As the development of dermatoglyphic pattern in utero is strongly influenced by genetic factors, it is worthwhile applying this mathematical science of genetics in various genodermatoses.

KEY WORDS: Dermatoglyphics, Darier's disease.

Materials and Methods

The cases of genodermatoses studied attended our skin clinic during the years 1977-1981. Study of palmar dermatoglyphics was carried out in 9 cases of Darier's disease. Clinical diagnosis made in those cases was confirmed by histopathological features. Family history with particular reference

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to consanguinity in the parents and similar disease in other family members was noted. The family pedigree was obtained. Palmar dermatoglyphic study was done in the affected family members and the non-affected very close relatives. One hundred normal individuals were used as the control group; 50 males and 50 females. The individuals in the control group were not related to each other. The Probands studied and the control subjects were South Indians.

Complete palm and rolled finger prints of both hands were recorded separately on smooth white papers by the standard Ink and Roller method. The palm and finger prints were studied for the following parameters.

1. Frequency of the finger tip pattern
2. Pattern study in thenar/ I_1 interdigital area, I_2 , I_3 & I_4 interdigital

- areas and hypothenar area of the palm.
3. Presence of simian crease, Sydney line, transitional crease and extra-digital transverse crease.
 4. Total finger ridge count (TFRC)
 5. a-b ridge count
 6. atd angle
 7. Position of axial triradius-t, t' and t''

The findings were analysed and tabulated. They were subjected to X² test and student 't' test. P value was noted for their statistical significance.

Results

9 cases of Darier's disease were studied (7 females and 2 males). The minimum age recorded was 5 years and the maximum age recorded was 47 years. 2 patients were born to consanguinous parents. Three cases showed involvement of family members. All cases had typical warty papular lesions in the characteristic distribution. In addition, 4 cases had flat topped papular lesions of acrokeratosis verruciformis over the dorsa of the hands and feet and 1 case showed bullous lesions of familial benign chronic pemphigus. All cases complained of pruritus except one which was asymptomatic. Skin

biopsy of the warty papular lesions showed typical histopathological features of Darier's disease in all cases. Onychauxis was present in 3 cases. In addition, one case showed longitudinal ridging and another case showed onychorrhhexis. 2 cases were mentally retarded. 2 cases had cardiovascular involvement. One of them had ischaemic heart disease and sinus bradycardia and another case had hypertension.

Dermatoglyphic study :

Qualitative analysis :-

Ulnar loop, whorl and arch patterns were observed over the finger tips. Whorl pattern was the predominant pattern in both sexes. The whorl pattern was 60% in the finger tips of the left hand and 80% in the finger tips of the right hand in the male probands. In the female probands it was 70% in the left hand and 50% in the right hand. The whorl pattern in the control group was 33.2% in the left hand and 36.4% in the right hand of males and the same pattern was 38.4% in the left hand and 39.6% in the right hand of females (Table 1). The finger tip pattern in female patients with Darier's disease was found to be statistically significant when compared with that of control group (Table 2). Arch pattern was present only in one female. No radial loop pattern was observed. No

TABLE 1
Percent of each finger tip pattern type in Darier's disease and controls.

	Ulnar loop (U)		Whorl (W)		Radial loop (R)		Arch (A)	
	L	R	L	R	L	R	L	R
Controls								
(n=50) M	60.0	57.6	33.2	36.4	4.0	2.8	2.8	2.8
(n=50) F	54.8	54.4	38.4	39.6	2.0	1.2	4.8	4.8
Darier's disease								
(n=2) M	40.0	20.0	60.0	80.0	—	—	—	—
(n=6) F	23.3	43.3	70.0	50.0	—	—	6.7	—

n=Number

M=Male; F=Female; L=Left hand; R=Right hand.

N.B :- One female case has been omitted in the finger tip pattern study owing to severe ridge dissociation.

TABLE 2
Finger tip pattern in Darier's disease compared with control group.
Females

	Control	Darier's disease	Total
Ulnar loop	273	20	293
Whorl	195	36	231
Radial loop & arch	32	4	36
Total	500	60	560

$\chi^2=9.788$

The variation in the finger tip pattern of Darier's disease from control group is significant.

$\chi^2=9.788$ with 2 df

P<0.01 Significant

identical finger tip patterns were observed in both hands. I_3 , I_4 and hypothenar areas showed patterns only in the females. 2 female cases showed small loop pattern (l) in I_3 area. One female case showed small loop pattern (l) in I_4 area. 6 females showed only radial loop (Lr) pattern in hypothenar area and that too mostly on the right palm.

Extradigital transverse crease (EDTC) was observed over the middle phalangeal regions of the ring fingers

(Fig. 1) of both hands in a female proband. Her mother also showed EDTC over the middle phalangeal and terminal phalangeal regions of the ring fingers (Fig. 2) of both hands.

Ridge dissociation (dotted ridges) (Fig. 3) was the characteristic feature observed in 8 out of 9 cases. Presence of wide flexion creases and white dots also were characteristic. White lines also were observed in 3 cases and one female case showed Sydney line in left palm (Table 3). White dots were observed in 8 cases.

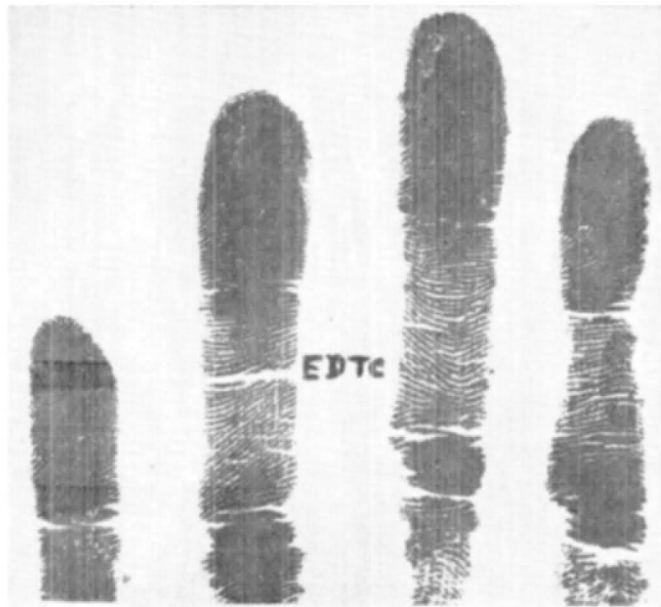
No Sydney line, wide flexion creases, ridge dissociation or white dots were observed in the control subjects. Only one female subject of the control group showed extradigital transverse crease. White lines were observed in 6 subjects of the control group.

Quantitative analysis :

The mean TFRC was 200 in males which was more than that of controls (146.7). The mean TFRC was 123.8 in females which was less than that of controls (141.8).

Fig. 1

Extra digital transverse crease (EDTC) over the middle phalangeal region of the ring finger (Daughter-Case No. 9)



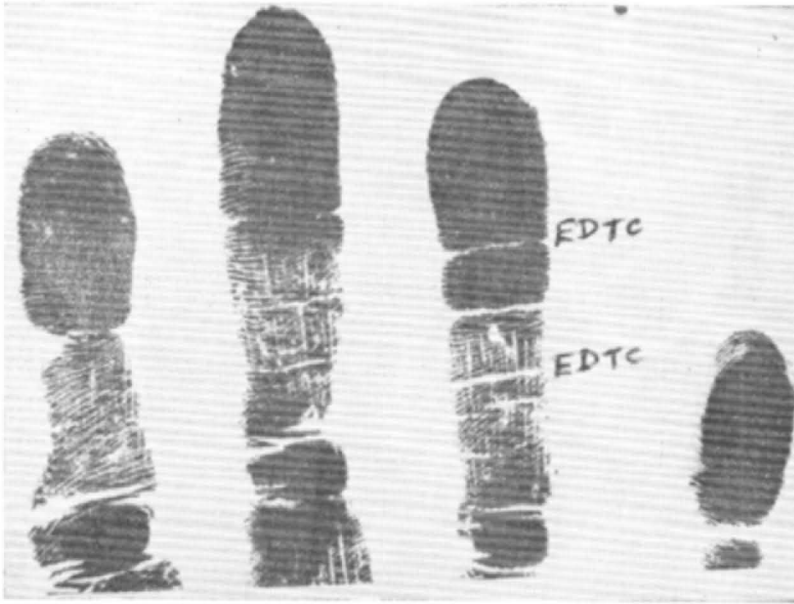


Fig. 2 Extradigital transverse crease (EDTC) over the middle and terminal phalangeal regions of the ring finger (Mother - Case No. 8)

TABLE 3

Percent of Palmar patterns and other features in 9 cases of Darier's disease.

Palmar pattern areas	No.	%	Others	No.	%
Th/I ₁	—	—	Sydney line	1	11.1
			EDTC	2	22.2
I ₂	—	—	Ridge dissociation	8	88.8
I ₃	3	25	Wide flexion creases	7	77.7
I ₄	3	25	White lines	3	33.3
H	9	75	White dots	8	88.8

EDTC = Extradigital transverse crease.

The mean summed a-b ridge count was difficult to obtain in males owing to severe ridge dissociation. The mean summed a-b ridge count was 37.8 in females which was slightly less than that of female controls (38.6). The mean summed atd angle was 40° in males and 41.1° in females and were slightly less than those of control subjects (41.1° in males and 42.5° in females) - (Table 4). t and t' position of axial triradius was observed (Table 5).

Discussion

The striking features observed were ridge dissociation (dotted ridges) and white lines and these findings were consistent with the findings already reported in literature^{1,2}. In addition, an increased frequency of whorls in both hands in both sexes, Sydney line, extradigital transverse crease, wide flexion creases and white dots were also noted in the present study. These findings have not been reported in literature so far.



Fig. 3 Ridge dissociation especially in hypothenar eminences, white lines in both palms and Sydney line in left palm in a case of Darier's disease.

TABLE 4

	Mean TFRC	Mean a-b ridge count	Mean atd angle
<i>Controls</i>			
(n=50) M	146.7	36.9	41.1°
(n=50) F	141.8	38.6	42.5°
<i>Darier's disease</i>			
(n=2) M	200.0	—	(n=1) M 40°
(n=6) F	123.8	(n=2) F 37.8	(n=4) F 41.1°

n=Number

M=Male: F=Female.

N.B: Some cases of Darier's disease have not been considered in the calculation owing to the presence of severe ridge dissociation.

The author would like to stress the importance of independent observation of such dermatoglyphic features in cases of Darier's disease by different authors in various parts of the world

to find out the true significance of their occurrence and racial variations.

TABLE 5

Position of axial triradius in 5 cases of Darier's disease.

Position of axial triradius	Left No. %	Right No. %
t	3 60	2 40
t'	2 40	3 60
t''	— —	— —

N.B: Four cases have been omitted in the data owing to the presence of severe ridge dissociation.

References

1. Cherril FR: Finger prints and disease. Nature, 1950; 166: 581-584.
2. Meinhof W: Morbus Darier (Dyskeratosis follicularis) XIII Congress Internationalis Dermatologiae, 1967; P, 26-28.