DERMATOGLYPHICS IN COLOR BLINDNESS

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In four families of color blind subjects, a dermatoglyphic analysis was made and the results compared with data from normal subjects. The Student's t *test, however, failed to show any significant differences in the means of the two groups.*

In syndromes connected to anomalies of the X chromosomes, such as the syndromes of Turner, Klinefelter, etc., dermal patterns may serve as an auxiliary diagnosis. We therefore carried out a dermatoglyphic study in color blindness, whose inheritance is X-linked and which can be present in individuals who show anomalies of the X chromosome, aiming at detecting possible peculiarities which may lead to at least suspect the condition of hemizygote in the color blind, and heterozygote in the carriers.

MATERIAL AND METHODS

We studied four families, comprising 55 individuals: 34 men (13 color blind), 21 women (7 carriers), and compared these with a control group of 30 men and 30 women. In all, the total finger ridge count (TFRC), atd angle, palmar areas and a-b ridge count were determined. The techniques described by Saldanha (1968) were followed.

After a routine ophthalmological examination (visual acuity, biomicroscopy, ophthalmoscopy, refractometry, etc.), an examination of chromatic vision was made with Ishihara plates, Hardy-Rand-Rittler atlas, Farnsworth panel D 15, 100 Hue test, Roth D 28 and Nagel anomaloscope.

RESULTS

In the control group, we obtained in the anomaloscope an anomaly quotient within the limits accepted by Francescetti (1963) for normal trichromatics, that is, from 1.3 to 0.65.

The seven carriers showed normal chromatic sense.

The percentage distribution of patterns in palmar areas for the different groups is shown in Table 1.

The means and variances of TFRC, atd angle and a-b ridge count for the different groups are analyzed in Table 2.

DISCUSSION

In general, the findings we have obtained in our control group are in agreement with those obtained by François et al. (1969) and Toledo et al. (1969). More particularly, when our TFRC mean values are compared to those obtained by Holt (1968) in England and by Toledo et al. (1969) in São Paulo, and when our a-b ridge count values are compared to the family data obtained by Fang (1950), our pattern of normality may be considered satisfactory.

In our comparisons with carriers and color blinds, no significant differences were found, except for the a-b ridge count in the carrier vs. normal females: the overlapping of the means being very large, however, the clinical value of this finding is rather limited.

Among the color blind, the only characteristic appeared to be an S pattern in the Hypothenar area, which is, however, a still normal, though rare, occurrence. The pattern is in fact also found in the patients' male relatives, which makes us think of a family trait.

Among the carriers, a great number of radial loops has been found in the Thenar-I area. This too, however, would seem to be a normal, though unfrequent, finding.

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Table 1. *Percentage distribution of patterns in palmar areas*

Palmar areas	Group studied	Right hand	Left hand
Thenar-I	Male control	0	0
	Color blind	0	0
	Female control	0	0
	Carrier	4.2	4.2
II	Male control	6.6	0
	Color blind	7.6	0
	Female control	0	0
	Carrier	0	0
III	Male control	56.6	26.6
	Color blind	61.5	33.8
	Female control	43.3	36.6
	Carrier	51.4	47.1
IV	Male control	36.6	36.6
	Color blind	38.4	38.4
	Female control	33.3	40.1
	Carrier	28.5	32.8
Hypothenar	Male control	26.5	29.8
	Color blind	30.6	20.1
	Female control	36.6	23.3
	Carrier	39.0	24.2

Table 2. *Total finger ridge count (TFRC), atd angle and a-b ridge count in the various groups*

Trait	Group studied	X	SD	t
TFRC	Male control	132.73	36.67	0.1
	Color blind	134.15	43.93	
	Female control	125.53	35.24	2.25
	Carrier	156.71	32.42	
atd	Male control	41.08	5.14	0.65
	Color blind	42.31	5.96	
	Female control	44.07	4.92	0.78
	Carrier	45.71	5.03	
a-b	Male control	39.4	6.35	1.26
	Color blind	41.73	5.20	
	Female control	39.77	4.57	2.67*
	Carrier	43.14	2.51	

* $p = 0.01$, all other t values nonsignificant.

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