Palmar Flexion Creases and Dermatoglyphics in Leprosy Patients [1]

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Palmar flexion creases and dermatoglyphics are valuable tools in understanding certain medical syndromes. Compared to dermatoglyphics, however, not much work on flexion creases has been done.

Leprosy is an infectious disease due to *Mycobacterium leprae*. Enna *et al* ([5]) found an association of some palmar and finger patterns with leprosy. They supported the hereditary susceptibility of the host to the organism as a predisposing factor. Satish Ghei ([12]) and other workers suggested that certain genetic factors are responsible for leprosy infection.

Bali ([1]) observed significant association of palmar creases with schizophrenia, leprosy and tuberculosis. He found more single transverse creases in leprosy patients. The central problem here is to know whether a relationship exists between leprosy and palmar flexion creases and dermatoglyphics.

MATERIALS AND METHODS

The subjects. The basis of this study was 115 male and 48 female leprosy patients. The patients were hospitalized in the Government Leprosy Hospital, Bangalore, Karnataka. The control population consisted of 536 males and 426 females of the same genetic population. The data is derived from three Nekararu (weavers) castes of Karnataka State. Care has been taken to avoid closely related individuals in both patients and controls. The data on patients include 93 male lepromatous, 22 male tuberculoid, 35 female lepromatous, and 13 female tuberculoid patients. They were classified on the basis of clinical data.

The analysis of palmar dermatoglyphics and C-line types followed the technics of Cummins and Midlo ([4]) and Plato ([9]), respectively. The analysis of palmar creases was done in accordance with the method of Bali and Chaube ([2]). The values in this study are of a qualitative nature. So the statistical interpretation of the data has been made by means of the Chi-square (X^2) test.

Bali and Chaube ([2]) classified the main flexion creases, distal transverse crease, proximal transverse crease, and radial longitudinal crease on the basis of a common point designated the "radial base point," a region occupied by the interdigital pad I. On the basis of this point or origin, the palmar creases are classified into three main categories: (S) single radial base crease (SRBC); (D) double radial base crease (DRBC); and (T) triple radial base crease (TRBC).

The double radial base creases are further classified into two groups on the basis of the doubling of the proximal transverse crease with the distal transverse crease (Fig. 1C-a) or with the radial longitudinal crease (Fig. 1C-b).

The finer classification of these principal types is based upon the initial bifurcation split of the transverse crease. If the split is radialward starting from the ulnarside, the subtypes are numbered according to the position of the splitting point (Fig. 1B). Double radial base creases are subdivided in accordance with the above definition into further subtypes (Fig. 1C). The subtypes of triple radial base creases have not been found so far (Fig. 1D).

The newly evolved classification of palmar flexion creases bears certain advantages over the classifications of Portius ([10]), Weninger and Navratil ([12]), Buchi ([3]), Kimura ([7]), Lestrange ([8]), and Gyenis and Gyorgy ([6]).

RESULTS

Table 1 shows palmar creases among leprosy patients and controls. Among male patients, the frequency of SRBC (35.1%) is more than among the controls (14.1%), but the frequency of DRBC in patients is less (56.9%) in comparison with the male con-

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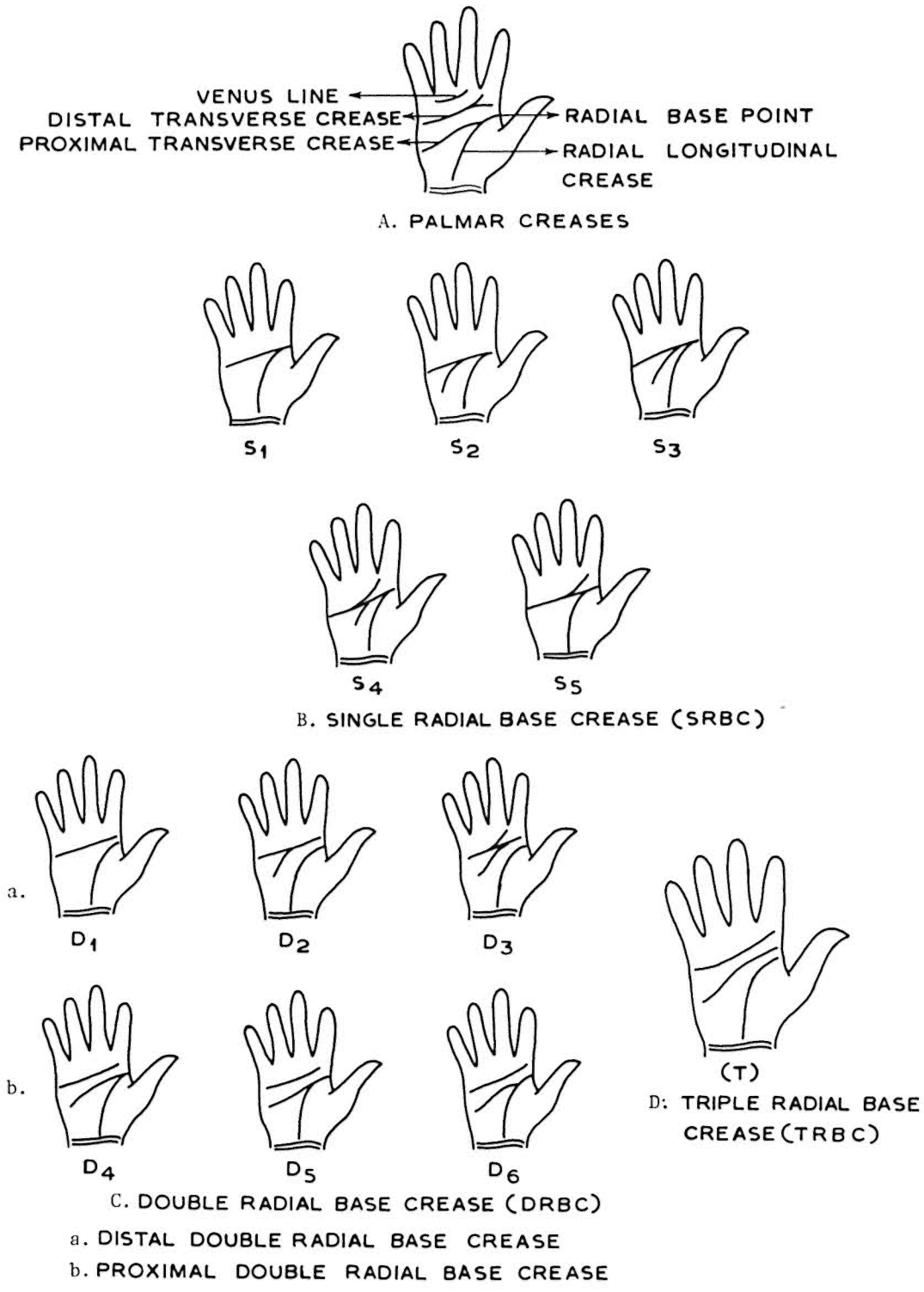

FIG. 1. Classification of palmar creases.

TABLE 1. *Palmar creases among leprosy patients and controls.*

		Disease						Control					
		SRBC		DRBC		TRBC		SRBC		DRBC		TRBC	
	Side	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Male	R	43	33.1	64	58.9	8	8.1	76	14.1	409	76.4	51	9.5
	L	39	37.1	58	54.9	9	8.0	76	14.1	428	79.7	32	6.0
	R+L	73	35.1	122	56.9	17	8.0	152	14.1	837	78.0	83	7.8
Female	R	10	20.7	33	69.1	5	10.2	34	8.3	324	75.2	68	16.0
	L	9	20.4	35	70.7	4	8.7	29	10.0	333	78.4	64	14.0
	R+L	19	20.5	68	69.9	9	9.5	63	9.1	657	76.8	132	15.0

M: $X^2 = 43.8$, df 2, $p < 0.001$ (S).
F : $X^2 = 15.2$, df 2, $p < 0.001$ (S).
Note: M = male patient vs. male control; F = female patient vs. female control; S = significant.

TABLE 2. *Main line formulas among leprosy patients and controls.*

Main line formulas	Male				Female			
	Disease		Control		Disease		Control	
	No.	%	No.	%	No.	%	No.	%
11.9.7-	71	(31.6)	358	(33.4)	33	(35.9)	153	(32.7)
9.7.5-	29	(13.1)	139	(13.0)	16	(17.4)	65	(13.9)
7.5.5-	35	(15.9)	168	(15.6)	14	(15.2)	80	(17.1)
Others	87	(39.4)	407	(38.0)	29	(31.5)	170	(36.3)

M: $X^2 = 0.18$; df 3, $p = 0.98$ (NS).
F : $X^2 = 0.74$, df 3, $p > 0.80$ (NS).
Note: M = male patient vs. male control; F = female patient vs. female control; S = significant; NS = not significant.

TABLE 3. *C-line types among leprosy patients and controls.*

C-line type	Male				Female			
	Disease		Control		Disease		Control	
	No.	%	No.	%	No.	%	No.	%
C-ulnar	69	(31.5)	389	(36.3)	38	(40.0)	183	(39.1)
C-radial	98	(43.9)	513	(47.9)	38	(40.0)	204	(43.6)
C-proximal	24	(11.0)	113	(10.5)	8	(7.4)	56	(12.0)
C-absent	30	(13.6)	57	(5.3)	11	(15.5)	25	(5.3)

M: $X^2 = 11.94$, df 3, $p = 0.001$ (S).
F : $X^2 = 6.1$, df 3, $p > 0.1$ (NS).
Note: M = male patient vs. male control; F = female patient vs. female control; S = significant; NS = not significant.

TABLE 4. *Axial triradii among leprosy patients and controls.*

"t"	Male				Female			
	Disease		Control		Disease		Control	
	No.	%	No.	%	No.	%	No.	%
Proximal	154	(66.9)	789	(73.6)	65	(68.4)	337	(72.0)
Distal	41	(17.8)	161	(15.0)	17	(17.9)	69	(14.7)
Multiple	30	(13.3)	122	(14.4)	13	(13.7)	62	(13.2)

TABLE 5. *Occurrence of patterns among palmar areas in leprosy patients and controls.*

Palmar area	Male				Female			
	Disease		Control		Disease		Control	
	No.	%	No.	%	No.	%	No.	%
Hypo.	57	(25.6)	292	(27.2)	37	(40.0)	163	(34.8)
Th/I intdg.	36	(16.6)	135	(12.6)	9	(8.4)	52	(11.1)
II intdg.	23	(10.3)	95	(8.9)	3	(3.4)	26	(5.6)
III intdg.	105	(42.3)	527	(49.2)	40	(42.0)	218	(46.6)
IV intdg.	111	(50.5)	614	(57.3)	49	(51.6)	283	(60.5)

M: IV intdg. $X^2 = 4.1$, df 1, $p = 0.05$ (S).
Note: M = male patient vs. male control; S = significant.
Some prints have been deleted due to incompleteness in Tables 2-5.

trols (78.0%). This shows that there is an inverse relationship between SRBC and DRBC of patients and controls which indicates some genetic association between male patients and male controls. Among female patients, the incidence of SRBC (20.5%) is remarkably more than among controls (9.1%); while the value of DRBC in the patients (69.9%) is lower than in the controls (76.8%). Here also an inverse relationship is observed between SRBC and DRBC. The frequency of TRBC among female patients (9.5%) is lower than among controls (15.0%). The differential trends of creases between male (df 2, $p = 0.001$) and female patients (df 2, $p = 0.001$) are significant in comparison with their control groups.

Among the subtypes of SRBC, the frequencies of S_3 and S_4 are high in patients of both sexes in comparison with the controls. Among the subtypes of DRBC, D_4 and D_5 are significantly lower in patients than controls. Similar observations were made by Bali ([1]). He found higher SRBC but lower DRBC among leprosy patients. He also observed a higher S_4 subtype and lower D_5 subtype among patients.

The differential trends of main line formulae between male patients and controls (df 3, $p = 0.98$) and female patients and controls (df, $p = 0.80$) are not significant. The C-absent lines are found in higher frequency in patients than controls. The deviations in C-line terminations between male patients and controls (df 3, $p = 0.001$) are significant but not in female patients and controls (df 3, $p = 0.1$). Lower differences are noticed in different types of axial triradii between patients and controls of both sexes. Among palmar pattern areas, the patterns in the IV interdigitial area of male patients are significantly lower than among controls (df 1, $p = 0.05$). A similar trend is also observed in female patients.

DISCUSSION

Enna *et al* ([5]) found significant association of finger and palmar dermal patterns with lepromatous patients. He emphasized the hereditary susceptibility of the host to this disease. Satish Ghei ([11]) and other workers also suggested that certain genetic factors are responsible for leprosy infection.

Palmar creases and dermatoglyphics are morphologic and genetic variables. The susceptibility to bacterial infection may be due to some genetic predisposition. More work in this respect merits further study.

SUMMARY

Palmar configurations of 115 male and 48 female leprosy patients were compared with 536 males and 426 female normal individuals of the same population. The data was derived from Nekararu (weavers) castes of Karnataka State, India. Among flexion creases, the single radial base crease (SRBC) especially showed more association with leprosy in both male and female patients than their respective controls. Among dermatoglyphics, only C-line types are significantly different in male leprosy patients as compared to their controls. The female patients also showed more C-absent lines than the control group. The susceptibility to bacterial infection may be due to some biologic deficiency which warrants continued investigation on a broader and more intensive basis.

RESUMEN

Se compararon las configuraciones palmares de 115 hombres y 48 mujeres con lepra con aquellas de 536 hombres y 426 mujeres normales de la misma población. El estudio se hizo en una población de tejedores del estado de Karnataka, India. Entre los surcos de flexión, los SRBC mostraron mayor asociación con lepra en los pacientes de cualquiera de los sexos que en sus controles respectivos. Entre los dermatoglifos, sólo las lineas del tipo C fueron significativamente diferentes en los pacientes hombres en comparación con sus controles. Los pacientes femeninos también mostraron mayor ausencia de lineas C que las mujeres del grupo control. La susceptibilidad a la infección bacteriana puede deberse a alguna deficiencia biológica que merece mayor investigación sobre bases más amplias e intensas.

RÉSUMÉ

Les configurations palmaires de 115 malades de la lèpre de sexe masculin, et de 48 malades de sexe féminin, ont été comparées aux configurations observées chez 536 hommes et 426 femmes normales de la même population. Les données ont été obtenues dans la caste des tisserands (Nekararu) de l'Etate de Karnataka, en Inde. Parmi les crêtes de flexion, c'est la SRBC plus particulièrement qui a présenté une association avec la lèpre, tant chez les malades de sexe masculin que chez ceux de sexe féminin, cette association étant beaucoup plus prononcée que chez les témoins. Parmi les dermatoglyphes, seuls les types de la ligne-C sont significativement différents chez les malades de la lèpre de sexe masculin, lorsqu'on les compare aux témoins. Les malades de sexe féminin présentent également plus de lignes avec absence de C, par rapport au groupe témoin. La susceptibilité à l'infection bactérienne peut être due à une déficience biologique. Il en résulte que ce problème mérite d'être exploré plus avant et de manière plus intensive.

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