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PALMAR FLEXION CREASE IN MALE SCHIZOPHRENICS AND THEIR FIRST DEGREE RELATIVES

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132 male schizophrenics who met APA-DSM III criteria for the diagnosis of Schizophrenia were selected. They were further subclassified into subtypes. 73 healthy normal males and 60 first degree male relatives of patients were also taken into study. They were matched for palmar flexion crease pattern. Few sub-types only differed from normals, hence heterogeneity in Schizophrenia has been noted. Implications of findings has been discussed and need for further investigation is highlighted.

"It was possible, over a period of years to examine the inheritance of the position of axial triradius in relation to mongolism before anything could be known about its chromosomal origin"

- *L.S. Penrose (1963)*

Perhaps this may be present day position of Schizophrenia where changes in Palmar Flexion crease and Dermatoglyphics has been observed by many investigators in the past, (Duis, 1973; Pon's, 1959; Raphael and Raphael, 1962; Mellor, 1968; Bali, 1971; Dasgupta *et al*., 1973; Murthy and Wig, 1987; Eswaraiah, 1978), but ignorance about the way of genetic transmission still prevails. At present there is no single theory of inheritance of Schizophrenia acceptable to all investigators. Slater and Cowie (1971) thought that single dominant gene with irregular penetrance is responsible, while Gottesman and Shields (1973) supported polygenic theory.

Regarding the genesis of the dermatoglyphic patterns and palmar flexion crease there is agreement among investigators that these are laid down as early as 7th to 14th week of development and as such any alteration in it is possible due to genetic and parental environmental factors (Worth, 1937; Humphrey, 1964; Mulvilhill and Smith, 1969; Popich and Smith, 1970). In case of genetic transmission it is to be expected that correspondence of chromosomal aberration and patterns should follow generation after generation; so somewhat more definite result can be obtained if groups of relatives are also studied.

The findings of earlier investigators of dermatoglyphics had been reviewed elsewhere (Mellor, 1968; Balgir and Murthy, 1982). In brief the contradictory findings of the past studies were due to lack of standard criteria for selection of patients, disregard to heterogeniety of Schizophrenia, absence of well matched control groups and also nonconsideration of male-female differences.

This study is a tiny attempt to fill the paucity of studies in Palmar crease and to overcome the drawbacks of previous studies. It is interesting to include the first degree relatives of patients as one of control group, which has never been done before.

MATERIAL AND METHODS

The present study was conducted in the Department of Psychiatry, S.N. Medical College, Agra, India. The 132 consecutive male patients who met APA-DSM III diagnosis of schizophrenia were selected. Their age ranged between 15-60 years and they were not suffering from any illness known to be associated with

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alteration of palmar crease. The patients were further classified according to same criteria. There were two control groups to compare with patients. First control group consisted of 73 normal males from the same geographical place of residence, religion and caste. They were screened for absence of mental illness in themselves, and absence of family history of mental illness was ascertained by detailed interview. Similarly second group of control consisted 60 first degree male relatives of patients. They were also screened for mental illness or physical illness which is known to alter the palmar crease pattern. The mean age of Schizophrenics, normal and relatives were 39.8, 34.2 and 35.5 years respectively. There was no statistically significant differences in mean age of the three study groups.

The palm prints of both the hands of all the subjects were taken by ink and pen method. The palmar flexion crease were analysed according to Bali and Chaube (1971). According to them main palmar crease are classified into distal transverse crease, proximal transverse crease and radial transverse crease. These crease do take origin from a common place on interdigital pad I. This origin point is called radial base point. On the basis of having one common point of distinction that is radial base point they are classified into three types.

i) Single Radial Base crease (SRBC)

ii) Double Radial Base crease (DRBC)

iii) Triple Radial Base crease (TRBC)

RESULTS

(Table No. 1 and 2)

SINGLE RADIAL BASE CREASE PATTERN

This type of pattern was found to be varying from one subtype to another subtype. Its frequency was more than normal in Disorganized and Undifferentiated, while in Paranoid and Residuals it was lower than the normal. Catatonic had nearly the same frequency of SRBC as the normal. Schizophrenia combined (pooled prints of all subtypes) had an edge over normal control. When subtype of schizophrenia were compared individually for SRBC with normal, no subtype except Paranoid did differ from normal. Paranoid only had significant lowering of SRBC, that too in the Rt. hand prints only.

SRBC pattern was found to be significantly higher in the Ist degree relatives of Schizophrenia when compared with normal, but it was limited to the Rt. hand print only.

The different subtypes when compared with the relatives group of control it was noted that those subtypes (Paranoid, Catatonic and Residual) having nearly same frequency of SRBC as the normal, differed from the relatives group of control. These subtypes were having very low frequency of SRBC on their Rt. hands so it made than altogether different from relatives. Disorganized and Undifferentiated subtypes having more SRBC as compared to normal and these subtypes were very near, in frequency of SRBC to the relative group.

DOUBLE RADIAL BASE CREASE PATTERN

This type of pattern was also found varying in frequency in different subtypes. The Paranoid and Catatonic were on the higher side of frequency and others being on lower. The lowering of DRBC only in undifferentiated was

Table-1 : Showing the percentage of palmar crease pattern in Normal, Schizophrenics combined, their subtypes, their Ist degree Relatives and Z statistics with Normal.

					Z value		
		Rt + Lt	Rt	Lt	Rt + Lt	Rt	Lt
Normal	No. of Palm Prints	146	73	73			
	Single Radial Base Crease (%)	6.18	6.84	5.48			
	Double Radial Base Crease (%)	86.93	84.93	89.04			
	Triple Radial Base Crease (%)	6.84	8.21	5.47			
Schizophrenic Combined	No. of Palm Prints	264	132	132			
	Single Radial Base Crease (%)	9.46	8.33	10.6	1.2238	0.3921	0.3580
	Double Radial Base Crease (%)	83.71	83.33	84.09	1.0157	0.3024	0.8100
	Triple Radial Base Crease (%)	10.60	12.12	9.09	1.3380	0.9178	0.9917
Paranoid	No. of Palm Prints	44	22	22			
	Single Radial Base Crease (%)	4.55	-	9.09	0.4381	2.3108*	0.5405
	Double Radial Base Crease (%)	90.9	95.45	86.36	0.7708	1.7245	0.328
	Triple Radial Base Crease (%)	4.55	4.55	4.55	0.6074	0.6878	0.1779
Catatonic	No. of Palm Prints	38	19	19			
	Single Radial Base Crease (%)	7.9	5.26	10.52	0.2208	0.2673	0.6702
	Double Radial Base Crease (%)	92.1	94.73	89.47	0.9980	1.4803	1.4803
	Triple Radial Base Crease (%)	-	-	-	2.5333*	2.5656*	2.1038*
Disorganized	No. of Palm Prints	44	22	22			
	Single Radial Base Crease (%)	11.37	9.09	13.63	1.0010	0.3308	1.0472
	Double Radial Base Crease (%)	77.26	68.18	86.36	1.4041	1.5654	0.3308
	Triple Radial Base Crease (%)	11.37	22.72	-	0.8236	1.5436	2.1038*
Undifferentiated	No. of Palm Prints	94	47	47			
	Single Radial Base Crease (%)	13.82	14.89	12.76	1.8771	1.3903	1.3140
	Double Radial Base Crease (%)	74.46	74.46	74.46	2.3572*	1.3758	1.9890
	Triple Radial Base Crease (%)	11.70	10.63	12.76	1.2429	0.9257	1.3158
Residual	No. of Palm Prints	54	27	27			
	Single Radial Base Crease (%)	3.7	3.7	3.7	0.7654	0.6709	0.3955
	Double Radial Base Crease (%)	77.77	77.77	77.77	1.4539	0.7929	1.2821
	Triple Radial Base Crease (%)	18.51	18.51	18.51	2.0545*	1.2669	1.6443
Relatives	No. of Palm Prints	120	60	60			
	Single Radial Base Crease (%)	18.60	23.33	13.33	3.0515**	2.6596*	1.5096
	Double Radial Base Crease (%)	75.00	68.33	2.4854*	81.66	2.5479*	1.1922
	Triple Radial Base Crease (%)	6.40	8.33	5.00	0.1442	0.0250	0.1270

* *significant difference ($p < 0.05$)* ** *significant difference ($p < 0.01$)*

Table-2 : Showing the percentage of palmar crease pattern in Relatives, Schizophrenics Combined, their subtypes and Z statistics with Relatives.

					Z value		
		Rt + Lt	Rt	Lt	Rt + Lt	Rt	Lt
Relatives	No. of Palm Prints	120	60	60			
Single Radial Base Crease (%)		18.60	23.33	13.33			
Double Radial Base Crease (%)		75.00	68.33	81.66			
Triple Radial Base Crease (%)		4.40	8.33	5.00			
Schizophrenic Combined	No. of Palm Prints	264	132	132			
Single Radial Base Crease (%)		9.46	8.33	10.6	2.3618*	2.5767*	0.5311
Double Radial Base Crease (%)		83.71	83.33	84.09	2.0639*	2.1994*	0.3996
Triple Radial Base Crease (%)		10.60	12.12	9.09	1.4383	0.8366	1.0877
Paranoid	No. of Palm Prints	44	22	22			
Single Radial Base Crease (%)		4.55	-	9.09	2.9641	4.0573**	0.8396
Double Radial Base Crease (%)		90.9	95.45	86.36	2.6720*	3.6353**	0.5239
Triple Radial Base Crease (%)		4.55	4.55	4.55	0.4805	0.6643	0.0857
Catatonic	No. of Palm Prints	38	19	19			
Single Radial Base Crease (%)		7.9	5.26	10.52	1.9005	2.4125*	0.3389
Double Radial Base Crease (%)		92.1	94.73	89.47	2.8643*	3.3460**	1.0317
Triple Radial Base Crease (%)		-	-	-	2.8699*	2.3396*	1.2077
Disorganized	No. of Palm Prints	44	22	22			
Single Radial Base Crease (%)		11.37	9.09	13.63	1.2151	1.7365	0.0327
Double Radial Base Crease (%)		77.26	68.18	86.36	0.3045	0.0129	0.5402
Triple Radial Base Crease (%)		11.37	22.72	-	0.9280	1.4989	1.2077
Undifferentiated	No. of Palm Prints	94	47	47			
Single Radial Base Crease (%)		13.82	14.89	12.76	0.9521	1.1208	0.0870
Double Radial Base Crease (%)		74.46	74.46	74.46	0.0892	0.7013	0.8780
Triple Radial Base Crease (%)		11.70	10.63	12.76	1.3283	0.4013	1.3807
Residual	No. of Palm Prints	54	27	27			
Single Radial Base Crease (%)		3.7	3.7	3.7	3.4018**	2.9969*	1.6924
Double Radial Base Crease (%)		77.77	77.77	77.77	0.3974	0.9440	0.3735
Triple Radial Base Crease (%)		18.51	18.51	18.51	2.1171*	1.2294	1.6929

** significant difference ($p < 0.05$) ** significant difference ($p < 0.01$)*

making the Rt. and Lt. hand pooled prints significantly low in DRBC as compared to normal.

Ist degree relatives of patients were also having significantly lower presence of DRBC, when Rt. hands were compared with normal.

Paranoid, Catatonic subtypes and pooled prints of all subtypes had significantly higher frequency of DRBC when their Rt. hands were matched with Lt. hands of relatives groups of control. Other subtypes were having nearly the same frequency of DRBC as the group of relatives.

TRIPLE RADIAL BASE CREASE PATTERN

The complete absence of this pattern in Catatonic and excessive presence in Residual made these subtypes to differ significantly from both control groups.

While in respect to SRBC and DRBC pattern the Control groups differentiated with each other, but in TRBC pattern there was no significant difference between them.

Paranoid, Disorganized and Undifferentiared did not differ regarding TRBC pattern from either control groups.

DISCUSSION

The variation of palmar crease pattern in subtypes is queit evident in present study. Only Disorganized and Undiffernetiated subtypes had shown a trend of increment in SRBC pattern and decrement of DRBC patttern. The statistically significant lowering of DRBC was noted only in Undifferentiated subtypes. These findings are similar to earlier noted findings by Bali (1971) and Eswaraiah (1978), with a difference that they reported it in Schizophrenics as whole and both pattern showed significant difference. Similarly the TRBC pattern was found to be significantly higher in the Residual Schizophrenics which was earlier reported by Eswaraiah (1978) though difference was insignificant.

The pooled prints of all subtypes when compared with normals did not show significant difference in any of the palmar crease patterns. The narrowing of palmar crease pattern difference between pooled prints of all subtypes of Schizophrenia and normal was simply because of the opposite trend of palmar crease pattern in Paranoid and Catatonic Schizophrenia.

The Ist degree relatives group was found to be very near in their palmar crease pattern to the subtypes Disorganized and Undifferentiated which differed much with normal controls and reverse was true for other subtypes. The differences in palmar crease pattern found in certain subtypes and normal and the fact that these subtypes were near to the relatives group in their palmar crease pattern, indicate that the subtypes Disorganized, Undifferentiated and relative's group of control belong to same genetic pool that is different from normal. Similarly the subtypes Paranoid and Catatonic have shown palmar crease pattern which is more nearer to normal in regard to SRBC and DRBC and differs much with relatives group. It seems to be genetically unrelated to other subtypes. In other words genetic predisposition is lesser possibility for these subtypes while Disorganized and Undifferentiated seems to have more genetic predisposition. The heterogeneity in schizophrenia is queit evident by variability of palmar crease pattern in different subtypes.

Lastly this study also differs from previous studies because both hand prints of Schizophrenics has not differed them from normal but it was Rt. hand prints which made them different while Lt. hand prints kept them near. The type of bilateral asymmetry which is compara-

ble to fluctuating asymmetrical presence of dermatoglyphic features in Schizophrenics (Markow and Wandler, 1986) was not seen by the previous investigators of palmar crease. Markow and Wandler (1986) feel thatthe nondirectional asymmetries are indicative of polygenic transmission as cause of illness.

Thus there was no peculiar pattern of palmar crease, uniformly differentiating Schizophrenic from normal, but different subtype could be differentiated from normal due to excessive presence or absence of some kinds of palmar crease. Hence only proportionately higher risk than normal to develop the specific subtype may be predicted by seeing palmar crease pattern but in no other way can it help in diagnosis of Schizophrenia or any subtype of it. There is need for further studies in this field to identify palmar crease patterns.

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