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Dermatoglyphics in Schizophrenia: The Relevance of Positive Family History

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Summary. In the present study dermatoglyphic features were studied in schizophrenics with and without positive family history of schizophrenia. It was found that the difference between normals and schizophrenics was further exaggerated in those schizophrenics with a positive family history for schizophrenia. The implications of the findings and the need for further work are highlighted.

Dermatoglyphic studies in schizophrenia have been carried out by a large number of investigators since 1935. So far the evidence has been controversial, some authors claiming definite diagnostic features (Raphael and Raphael, 1962), while other studies point to no significant clinical value (Rosner and Steinberg, 1968). One major factor contributing to these contradictory findings has been the heterogeneity of schizophrenic illness; thus, the studies of Mellor (1968) and Srinivasa Murthy (1975) showed significant differences among the schizophrenic subcategories. The findings of earlier investigations have been reviewed in detail elsewhere (Mellor, 1968; Holt, 1972).

At present there is no single theory of inheritance of schizophrenia acceptable to all investigators. Slater and Cowie (1971) think that a single dominant gene with irregular penetrance is responsible, while Gottesman and Shields (1973) support the polygenic theory. There is greater support for the relevance of a positive history of schizophrenia in the family to aetiology, clinical features and outcome. Rosenthal (1959) reports a higher concordance in twins for schizophrenia in those with genetic predisposition. Dementeva (1963) observed differences in the type of onset, presence or absence of precipitating factors and premorbid personality between those with and those without schizophrenic traits. Electroencephalographic differences have been reported by Ivanitskiy and Natalevich (1969) and by Solomon (1967). Recently Schooler *et al* (1971) and McCabe *et al* (1971) found that a poor prognosis was correlated with an increased number of relatives with a diagnosis of schizophrenia.

In view of these noted differences it is interesting that to date no one has investigated the relation between a positive family history of schizophrenia and the dermatoglyphic features. The present report is intended to fill this lacuna.

Material and Methods

The sample consisted of ethnically similar groups (based on parentage, residence, religion and caste) of Punjabi normal and schizophrenic subjects in North India. One hundred and twenty schizophrenics, of each sex, were fingerprinted and studied. The diagnosis was arrived at with the use of clinical data and a check list of symptoms (Breakey and Goddell, 1972). Only those patients with clear-cut clinical picture and whose diagnosis was not in doubt were included. The schizophrenics belonged to four subcategories, 30 each, namely acute schizophrenic episode, catatonic, paranoid and chronic undifferentiated schizophrenia, classified according to criteria in APA-DSM II (1968). The presence or absence of a family history of schizophrenia was ascertained by detailed interview of family members and cross-checking of the clinical records. Patients with relatives having

other psychiatric illnesses were excluded. Normal subjects (120 of each sex) belonging to the same ethnic group and not having any known family history of mental illness or of other congenital or hereditary illnesses were used as controls. These normal subjects were not related to each other or to the patients. Finger and palm prints were taken, using the ink and pad method described by Cummins and Midlo (1961). Analysis was carried out for both qualitative and quantitative characteristics, namely the frequencies of finger-print patterns, the total ridge count and the maximal 'atd' angle, along the standard criteria (Cummins and Midlo, 1961; Penrose, 1968).

Results

Finger patterns

These are set out in Tables I and II.

Table I

Frequency of finger-print patterns in male schizophrenics with and without family history of schizophrenia

Patterns	With family* history (35)	Without family* history (85)	Normals (120)
Arches ..	6·57%	3·41%	2·25%
Loops ..	49·43%	56·35%	50·58%
Whorls ..	44·00%	40·24%	47·17%
Total ..	100·00%	100·00%	100·00%

* $\chi^2 = 8{\cdot}6934$; df = 2; $p < 0{\cdot}05$

Table II

Frequency of finger-print patterns for female schizophrenics with and without family history of schizophrenia

Patterns	With family* history (N = 21)	Without family* history (N = 99)	Normals (120)
Arches ..	2·38%	3·33%	4·67%
Loops ..	57·62%	62·12%	56·92%
Whorls ..	40·00%	34·55%	38·41%
Total ..	100·00%	100·00%	100·00%

* $\chi^2 = 2{\cdot}5243$; df = 2; P = NS

Total ridge count

The difference between those with and without family history was not significant in either males (128·50 *vs* 142·525) or females (130·225 *vs* 125·875). However, the difference in males was approaching significance. The normal values for males and females were 148·04 and 128·45, respectively.

'atd' angle

The differences between the two groups in regard to maximal 'atd' angle was not significant in either males (77·929 *vs* 79·560) or females (84·50 *vs* 82·48). The values for normal males and females were 72·42 and 78·75, respectively.

In the present study, the differences noted between those schizophrenics with and those without a positive family history is an accentuation of the noted differences between normals and schizophrenics. Thus, in males the frequency of arches is 2·25 per cent, 3·41 per cent, 6·57 per cent in normals, in schizophrenics without family history and those with such history, respectively. Similar percentages are noted in females in the reverse order (4·67 per cent *vs* 3·33 per cent *vs* 2·38 per cent). Further, the noted 'tendency for levelling off of the dermatoglyphic sex differences' in schizophrenics is accentuated in those with a positive family history. Similar observations are noted for the total ridge count. The levelling of sex differences has also been described by Duis (1937) and Mellor (1968) for finger patterns and by Mellor (1968) for total ridge count.

Discussion

The above differences, largely tentative in view of the limited numbers studied, add another dimension to the reported differences in those having 'genetic loading' reviewed earlier. The findings also support the need for studying schizophrenia as a syndrome and not as a single disease entity, and for selecting clearly defined subgroups for intensive study. It is interesting to note that the levelling off of the sex differences has been reported for another anthropometric measure, namely androgyny, by Cowie *et al* (1960). Studies to correlate changes in androgyny and dermatoglyphic features are called for.

The problem of identifying the 'predisposed' in the affected families of schizophrenics is still with us. Earlier investigators considered 'ridge

dissociations' to be indications of schizophrenic stigmata (Raphael and Raphael, 1962 Lucas; and Lehrenbecher, 1969). Though the evidence available at present is insufficient for such a view, intensive study of families with more than one schizophrenic member could provide further important clues.

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REFERENCES

APA-DSM II (1968) *American Psychiatric Association—Diagnostic and Statistical Manual—II*. Washington.

BREAKEY, W. & GODELL, H. (1972) Thought disorder in mania and schizophrenia evaluated by the grid test. *British Journal of Psychiatry*, **120**, 391.

COWIE, V., COPPEN, A. & NORMAN, P. (1960) Nuclear sex and body build in schizophrenia. *British Medical Journal*, *ii*, 431.

CUMMINS, H. & MIDLO, C. (1961) *Finger Prints, Palms and Soles: an Introduction to Dermatoglyphics*. New York: Dover.

DEMENTEVA, N. F. (1963) The factors causing schizophrenia in connection with psychogenesis. (*NIMH Abstract 4719*).

DUIS, B. T. (1937) Fingerleisten bei Schizophrenen. *Zeitung für Morphologie und Anthropologie*, **36**, 391. (Quoted by Cimmins and Midlo, 1961.)

GOTTESMAN, I. I. & SHIELDS, J. (1973) Genetic theorizing in schizophrenia. *British Journal of Psychiatry*, **122**, 15.

HOLT, S. B. (1972) Dermatoglyphics in medicine. CRC critical reviews in *Clinical Laboratory Sciences*, June 1972, pp 227–53.

IVANITSKIY, A. M. & NATALEVICH, E. S. (1969) Comparative clinico-electroencephalographic investigation of schizophrenic patients with and without heredity loading (*NIMH Abstract 73740*).

LUCAS, G. J. & LEHRENBECHER, W. (1969) Dermatoglyphics in schizophrenia. (C) *British Journal of Psychiatry*, **115**, 1347.

MCCABE, M. S., FOWLER, R. C., CADORET, R. J. & WINOKUR, R. G. (1971) Familial differences in schizophrenia with good and poor prognosis. *Psychological Medicine*, **1**, 326.

MELLOR, C. S. (1968) Dermatoglyphics in schizophrenia. *British Journal of Psychiatry*, **114**, 1387.

PENROSE, L. S. (1968) Memorandum on dermatoglyphic nomenclature (ed. Bergsma, D.). *Birth Defects Original Articles Series*, Vol. IV, No. 3. The National Foundation—March of Dimes, New York.

RAPHAEL, T. & RAPHAEL, L. G. (1962) Finger prints in schizophrenia. *Journal of American Medical Association*, **18**, 215.

ROSENTHAL, D. (1959) Some factors associated with concordance and discordance associated with respect of schizophrenic twins. *Journal of Nervous and Mental Disease*, **129**, 1.

ROSNER, F. & STEINBERG, F. S. (1968) Dermatoglyphic patterns of negro men with schizophrenia. *Diseases of the Nervous System*, **29**, 739.

SCHOOLER, N. R., BOOTHE, H. & GOLDBERG, S. C. (1971) Life history and symptoms in schizophrenia. *Archives of General Psychiatry*, **25**, 138.

SLATER, E. & COWIE, V. (1971) *Genetics of Mental Disorders*. Oxford Monographs on Medical Genetics, Oxford University Press.

SOLOMON, S. (1967) The neurological evaluation. In *Comprehensive Textbook of Psychiatry* (eds. Freedman, A. M. and Kaplan, M. I.), p 420. Baltimore: Williams and Wilkins.

SRINIVASA MURTHY, R. (1975) Dermatoglyphics in schizophrenia. M.D. Thesis. Postgraduate Institute of Medical Education and Research, Chandigarh, India.

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