DERMATOGYPHYCS IN MALE CATATONIC SCHIZOPHRENICS

H. P. JHINGAN, G. C. MUNJAL

SUMMARY

Dermatoglyphic features, qualitative as well as quantitative, of finger and palm prints of 50 male I. C. D.9 diagnosed catatonic schizophrenics and as many ethnically matched normal controls of the same sex, were examined. Patients were found to differ from the control group in qualitative as well as quantitative features quite similar to the findings of the past three investigators. These differences in the dermatoglyphic features of catatonic schizophrenics and normal controls might be a genetic marker for catatonic schizophrenia. A larger sample study is required to put this hypothesis on strong footing.

Search for the etiology of schizophrenia is continuing. Biological, psychological and social factors have been implicated but no consensus has emerged till now. One of the factors studied in this context is dermatoglyphics. Poll (1935) was the first one to publish a study of dermatoglyphics in schizophrenia. Since then a large number of dermatoglyphic studies in schizophrenia have been published (Moller, 1935; Duis, 1939; Wendt and Zell, 1951; Pons, 1959; Raphael & Raphael, 1962; Beckman and Norring, 1963; Biswas and Bardhan, 1966; Singh, 1967; Moller, 1968; Rosner and Steinberg, 1968; Sank, 1968; Lucas and Lehrenbecher, 1969; Stowens et al., 1970; Bali, 1971; Rothhammer et al., 1971; Kemali et al., 1972; Polaidnak, 1972 Dasgupta et al., 1973; Srinivasas Murthy, 1975; Kemali et al., 1976; Eswarain, 1978; Mericq, 1979; Karmarkar and Malhotra, 1980; Ponnudrai, 1981) but no clear picture has emerged. This can be attributed to small sample size, standard diagnostic criteria not being used, controls not being matched ethnically, schizophrenia not being considered heterogenous illness and incomplete analysis of dermatoglyphic features in most of the studies. Only three published studies have taken into account the sub-categories of schizophrenia (Moller, 1968; Rosner and Steinberg, 1968; Srinivasas Murthy, 1977). On the basis of this meagre data it is difficult to reach conclusions. So, there was a need for a well-controlled study taking into account the sub-categories of schizophrenia.

The present study was designed to highlight the significance of dermatoglyphics in male catatonic schizophrenics. The primary aim of the study was to compare the finger and palm prints of male catatonic schizophrenics with those of the normal male population sample for quantitative as well as qualitative features.

MATERIAL AND METHODS

Patients were taken from two sources viz. GB Pant Hospital, New Delhi and Hospital for Mental Diseases, Shahdara, Delhi. G. B. Pant Hospital is exclusively a referral hospital catering to the needs of patients from all parts of Delhi and surrounding states. Hospital for Mental Diseases, Shahdara, is the only mental hospital in the capital of India. Inpatients as well as outpatients were included for the study. Fifty male patients of catatonic schizophrenia diagnosed according to I.C.D.-9

1. Presently Assistant Prof. in Psychiatry at D. A. C., Dept. of Psychiatry, A. I. I. M. S., New Delhi.
2. Professor and Head, Department of Psychiatry, Maulana Azad Medical College and Associated I., N. J. P. and G. B. Pant Hospitals, New Delhi.
DERMATOGLYPHICS IN MALE CATATONIC SCHIZOPHRENCIS were taken for the present study. These patients diagnosed by a consultant psychiatrist as suffering from catatonic schizophrenia were further evaluated by either of the authors to check whether it fulfilled the 'ICD-9' criteria or not. All cases with a doubtful diagnosis were excluded. Those cases with an additional diagnosis of any other neuropsychiatric disorder or a hereditary physical illness were excluded. Only patients in the age group of 15-60 years were included. Patients with a family history of psychiatric illness other than schizophrenia were excluded. Ethnic data including religion, caste and place of residence—own as well as parental, was recorded for every patient.

Fifty normal males well-matched ethnically were taken as controls. These individuals were not related to each other. They had no family history of any mental illness, hereditary or congenital illness. They were volunteers from the general population of Delhi.

'Ink and Pad' method was used for taking dermatoglyphic prints of the subjects (Srinivasa Murthy and Wig, 1977). Rolled prints were taken to avoid incomplete configuration and erroneous classification. Soon after the print is taken it is examined with a magnifying lens for details and clarity in the different fingers and palmar areas. If the print is not clear it is taken again.

The finger and palm prints were then analysed for qualitative as well as quantitative features. Qualitative feature studied were patterns in the fingers, interdigital areas (I₂, I₃ & I₄), thenar/I₁, and hypothenar areas. Quantitative features studied were 'total ridge count' and 'atd' angle, individual hand and together. Cummins and Midlo (1961) were followed in the analysis of the dermatoglyphic features. Finger and palm prints were analysed blindly.

The data obtained was subjected to various statistical tests of significance viz chi-square test, z-test and t-test and difference were found between the two groups—patients and controls.

RESULTS

The patients were found to have more arches and loops and less whorls (Table 1.). This was statistically highly significant. The patients had more patterns in hypothenar palm area than the controls but the difference could not reach the level of significance. The frequency of patterns in thenar/I₁ palm area was less in patients than in the control group (Table 2). The two groups did not differ in the frequency of patterns in I₂ palmar area. The patient group had less patterns in I₃ (Table 3) and I₄ (Table 4) palmar areas.

Difference in the 'total ridge count' between the two groups could not reach the level of statistical significance. Patient group has a smaller 'atd' angle than the control group (Table 5). This difference was statistically highly significant.

TABLE 1. Comparison of the frequency of finger-print patterns in normal males and catatonic schizophrenics of the same sex

| Pattern | Normal(n = 50) | Patient(n = 50) |
|---------|---------------|----------------|
| Arches  | 1.6           | 6.8            |
| Loops   | 49.0          | 57.8           |
| Whorls  | 49.4          | 35.4           |

\[ X^2 = 31.28, \text{ d. f.} = 2, p < 0.001 \]

TABLE 2. Comparison of the frequency of patterns in thenar/I₁ palm area in normal males and catatonic schizophrenics of the same sex

| Group    | % of palms in which pattern is present | % of palms in which no pattern is present |
|----------|--------------------------------------|----------------------------------------|
| Normals  | 23                                    | 77                                     |
| Patients | 11                                    | 89                                     |

\[ X^2 = 5.10, \text{ d. f.} = 1, p < 0.05 \]
TABLE 3. Comparison of the frequency of patterns in $I_3$ palmar area in normal males and catatonic schizophrenics of the same sex

| Group | % of palms in which pattern is present | % of palms in which no pattern is present |
|-------|--------------------------------------|------------------------------------------|
| Normals | 70 | 30 |
| Patients | 53 | 47 |

$X^2 = 6.10$, d. f. = 1, $p < 0.02$

TABLE 4. Comparison of the frequency of patterns in $I_4$ palmar area in normal males and catatonic schizophrenics of the same sex

| Group | % of palms in which pattern is present | % of palms in which no pattern is present |
|-------|--------------------------------------|------------------------------------------|
| Normals | 80 | 20 |
| Patients | 59 | 41 |

$X^2 = 10.4$, d. f. = 1, $p < 0.005$

TABLE 5. Comparison of 'atd' angle in normal males and catatonic schizophrenics of the same sex

| Group | Mean | S. D. | Significance of difference |
|-------|------|------|---------------------------|
| Normals (n = 50) | 82.55 | 10.60 | $Z = 4.22$ |
| Patients | 74.48 | 8.37 | $p < 0.001$ |

DISCUSSION

There is enough evidence to indicate that schizophrenia is a heterogeneous illness (Eswareniah, 1978). However, most of the dermatoglyphic investigators have considered schizophrenia as one disease and hence the results have been variable. Only three investigators (Mellor, 1968; Rosner and Steinberg, 1968; Srinivasa Murthy, 1975) have studied the dermatoglyphic patterns of the subcategories of schizophrenia. All these investigators have used different criteria of classification of schizophrenia. Whereas Mellor used Leonhard's classification of schizophrenia as described by Fish (1958), Srinivasa Murthy used DSM II. Rosner and Steinberg have not specified their mode of classification. Different modes of classification might result in varying results. However, catatonic variety of schizophrenia in DSM II is no different from that of 'ICD-9' which has been used in the present study. Leonhard's classification includes only chronic cases in the category of catatonic schizophrenia; however the symptomatology of the patients is similar to that described in ICD-9. So these studies can be compared with the present study (Table 6).

Normal males and catatonic schizophrenics of the same sex differed significantly in finger pattern frequency and palmar patterns in this study. Patients had a higher frequency of arches and loops and a lower frequency of whorl patterns in the fingers, similar to the findings of Srinivasa Murthy (1975). Mellor (1968) also found a higher frequency of loops and a lower frequency of whorls in his study but this failed to reach level of significance; this could be attributed to small size of the sample.

Patients had a lower frequency of patterns in thenar/$I_1$, $I_3$ and $I_4$ palmar areas in the present study. Rosner and Steinberg (1968) also found a lower frequency of patterns in $I_3$ palmar area although this finding reached the level of significance only in the right hand. Mellor, however, found an increased frequency of patterns in $I_3$ area but his sample included male as well as female population.

Analysis of quantitative data shows that patients had significantly lower 'atd' angle as compared to male controls in contrast to the finding of Mellor who reported a higher 'atd' angle in the catatonic schizophrenic group. 'Total ridge count' has been found to be lower in male catatonic schizophrenics in all the investigations (Mellor, 1968; Srinivasa Murthy, 1975 and the present study). However, the difference could reach the
level of significance only in the Mellor's study.

These differences in dermatoglyphic features in male catatonic schizophrenics and controls suggest that the differentiating dermatoglyphic features might be 'genetic marker' for the category of catatonic schizophrenia. As is known that the dermatoglyphic patients are determined mainly by genes and less by environment (Holt, 1961; 1968), catatonic schizophrenia also seems to be determined at least to some extent by genes which are closely related to those of the various dermatoglyphic patterns which is a multifactorial character. As catatonic schizophrenia differs from the normal group in more than one dermatoglyphic features, this might indicate that this is an illness determined by many genes.

However, various studies differed from each other in two dermatoglyphic features viz. palm patterns and 'a&d' angle. These differences can be explained by the small sample size in most of the previous studies, differing diagnostic criteria and the possibility that catatonic schizophrenia is a heterogeneous illness and so a larger representation of one type of catatonic schizophrenia in one study may produce different results from another study in which another type of catatonic schizophrenia predominates. This is supported by varying response of different catatonic schizophrenics to same treatment.

It is recommended for further research that large sample studies (at least 100 patients) with standard diagnostic criteria should be conducted to strengthen or weaken the findings of the present study. Attempt should be also made to sort out subcategories of catatonic schizophrenia. There is a possibility that some of the sub-categories of catatonic schizophrenia may have a positive relation to the dermatoglyphic features. Predictive value of dermatoglyphics for development of catatonic schizophrenia can also be evaluated.
REFERENCES

Bali, R. S. (1971). Palmar Creases and Schizophrenia. International Symposium of Human Genetics, Waltair.

Beckman, I. and Norring, A. (1963). Finger and Palm Prints in Schizophrenia. Acta Genet. (Basel), 13, 170.

Biswas, P. C. and Bardhan, A. (1966). Palm Prints and Schizophrenia. Anthropologist, 13, 1.

Cummins, H. and Middlo, C. (1961). Finger Prints, palms and Soles. An introduction to Dermatoglyphics, New York: Dover.

Dasgupta, J.; Dasgupta, D. and Balasubrahmanyam, M. (1973). Dermatoglyphics in the diagnosis of schizophrenia. Indian Journal of Psychiatry, 15, 104.

Duits, B. T. (1939). Fingerleisten bei Schizophrenen. Z. Morphol. Anthropologie, 36, 391-417.

Eswaraiah, A. (1978). Palm Prints and Schizophrenia. Indian Journal of Psychiatry, 20, 349.

Fish, F. J. (1958). Leonard's Classification of Schizophrenia. Journal of Mental Sciences, 104, 943-971.

Holt, S. B. (1961). Inheritance of dermal ridge patterns. In: Recent Advances in Human Genetics, (Ed.) Penrose, L. S., London: Churchill.

Holt, S. B. (1968). The genetics of dermal ridges. Charles Thomas, Springfield Ill.

Karmarkar, B. and Malhotra, K. C. (1980). Palmar dermatoglyphics in schizophrenia. Paper read in international symposium on dermatoglyphics held from Feb. 18-23, Punjabi University, Patiala, India.

Kemali, D.; Polani, P. E.; Polani, N. and Amati, A. (1972). Dermatoglyphics in a small sample of Italian males, mostly with paranoid schizophrenia. Acta Neurol (Napoli), 27, 306.

Kemali, D.; Polani, B.; Polani, P. E. and Amati, A. (1976). A dermatoglyphic study of 219 Italian schizophrenic males. Clin. Genet., 9, 51.

Lucas, B. J. and Lehrer Becher, W. (1969). Dermatoglyphics in Schizophrenia (C). British Journal of Psychiatry, 115, 1347.

Mathysor, S. W. and Kidd, K. K. (1976). Estimating the genetic contribution to schizophrenia. American Journal of Psychiatry, 133, 2, 185.

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

Merics, H. R. (1979). Finger Print Pattern frequencies in schizophrenics; importance of ethnic origin and 'Plexus visualization scores' ratings. Hum. Hered., 29, 311.

Moller, N. B. (1935). Undersogelser over finger aftrykket som Konstitutionelt Kendetegn ved Sindssygdomme. Hospitalstidende, 1085-1111.

Poland, A. K. (1972). Dermatoglyphics of negro male schizophrenics. British Journal of Psychiatry, 120, 397.

Poll, H. (1935). Dactylographische Geschlechtsunterscheidung der Schizophrenen. Mchr. Psychiat. Neurol, 91, 65-71.

Ponnudurai, R. (1981). A study of dermatoglyphics in male schizophrenics. Acad. Med. Sci., 17, 21.

Pons, J. (1939). Relaciones entre esquizofrenia y líneas demopapilares. Genetica Iberica, 11, 1-25.

Raphael, T. and Raphael, L. G. (1962). Finger-prints in schizophrenia. Journal of American Medical Association, 180, 213-219.

Rosner, F. and Steinberg, F. S. (1968). Dermatoglyphic Patterns of negro men with schizophrenia. Dis. Nerv. Sys., 29, 733-743.

Rothhammer, F.; Pereira, G.; Camousseight, A. and Benado, M. (1971). Dermatoglyphics in schizophrenic patients. Hum. Hered., 21, 198.

Sank, D. (1968). Dermatoglyphics of childhood schizophrenia. Acta Genet. Stat. Med. (Basel), 18, 304.

Singh, S. (1967). Dermatoglyphics in Schizophrenia. Acta Genet. (Basel), 17, 348.

Srinivasa Murthy, R. (1975). Dermatoglyphics in schizophrenia. M. D. thesis (Psychiatry), Post Graduate Institute of Medical Education and Research, Chandigarh.

Srinivasa Murthy, R. and Wig, N. N. (1977). Dermatoglyphic study of male schizophrenics. Indian Journal of Psychiatry, 19, 40.

Stoever, D. Sammon, J. W. and Proctor, A. (1970). Dermatoglyphics in female schizophrenia. Psychiat. Quart., 44, 316.

Wendt, G. G. and Zell, W. (1951). Schizophrenie und Fingerleistemuster. Arch. Psychiat. Z. Neuroul., 186, 436-463.