PALMAR DERMATOGLYPHICS IN SCHIZOPHRENIA

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Palm prints of 55 male and 33 female schizophrenic patients from Assam Medical College, Dibrugarh were examined for a possible association between palmar dermatoglyphic characteristics and the disease. There was a marked difference between patients and normal controls with regard to palmar C line termination, axial triradii, number of ridges at the a-b interdigital area and the frequency of various palmar flexion creases.

Key words: dermatoglyphics, palm, schizophrenia, clinical aspects.

INTRODUCTION

In the last few decades quite a large number of congenital and hereditary diseases are being investigated for dermatoglyphic markers. Cummins (1936, 1939) was the first to demonstrate the existence of characteristic dermatoglyphic features associated with Down’s syndrome. Alter (1966), Holt (1968), Schauman and Alter (1976) have, among others, reviewed in detail the existing literature on this subject.

Contemporary dermatoglyphics research has shown a large number of behavioral abnormalities to be associated with typical dermatoglyphic characteristics. Mental retardation of unknown origin also shows significant frequent patterning of the palmar fields, particularly on the hypothenar, thenar and distally located axial triradii. Mavalwala (1977) lists an extensive bibliography on dermatoglyphics in schizophrenia.

Surveying the literature on palmar dermatoglyphics in schizophrenia, it appears that very little work has been done on Indian schizophrenics. Till date only a few studies are available (Biswas & Bardhan, 1966; Singh, 1967; Bali, 1971a & 1971b; Laha, 1978; Kurien et al, 1978; Dasgupta, 1978; Eswaraiah, 1978; Balgir et al, 1980; Karmakar & Malhotra, 1981; Jain, 1991). It is somewhat surprising that similar studies from north east India are conspicuous by their absence. In this regard, it must be pointed out that the results obtained so far are inconclusive and often contradictory. In view of inconsistent findings, the purpose of the present study is to examine a few dermatoglyphic features in a further series of schizophrenics from Assam.

MATERIAL AND METHODS

Dermatoglyphic prints of eighty eight patients (55 male and 33 females) diagnosed according to usual clinical criteria, formed the actual study sample and these were collected from the psychiatry department of Assam Medical College, Dibrugarh by one of us (SDB). Prints of 79 healthy individuals (45 males and 34 females) were taken to serve as controls. The controls were drawn from the same stock of population which represented the disease group.

Termination of palmar main lines and formulation of axial triradii were done following the guidelines of Cummins and Midlo (1961). The classification of C line termination of palm established by Plato (1970) was followed and palmar a-b ridge counts were obtained according to Pons (1964). The maximal ad angle was measured according to Mavalwala (1963) and the analysis of palmar flexion creases were done following the methods proposed by Bali and Choube (1971). The data was subjected to Chi square and t test analysis.

RESULTS

Termination of main lines:

Table 1 shows the percentage frequencies of termination of main line C in schizophrenics and controls. The frequency of ulnar type of C line termination is higher than other types and both the control and patient population show consistency in this regard. The frequency of absent category is considerably higher in schizophrenics in both sexes as compared to normal controls. Computed Chi square values between normals and patients on this trait are given in Table 6, which reveal a significant difference. One point which merits mention is that, with the exception of main line C, none of the other main lines (D, B, and A) show any significant difference between schizophrenics in both sexes as compared to normal controls. Computed Chi square values between normals and patients on this trait are given in Table 6, which reveal a significant difference. One point which merits mention is that, with the exception of main line C, none of the other main lines (D, B, and A) show any significant difference between schizophrenics in both sexes as compared to normal controls. Computed Chi square values between normals and patients on this trait are given in Table 6, which reveal a significant difference. One point which merits mention is that, with the exception of main line C, none of the other main lines (D, B, and A) show any significant difference between schizophrenics in both sexes as compared to normal controls. Computed Chi square values between normals and patients on this trait are given in Table 6, which reveal a significant difference. One point which merits mention is that, with the exception of main line C, none of the other main lines (D, B, and A) show any significant difference between schizophrenics in both sexes as compared to normal controls. Computed Chi square values between normals and patients on this trait are given in Table 6, which reveal a significant difference. One point which merits mention is that, with the exception of main line C, none of the other main lines (D, B, and A) show any significant difference between schizophrenics in both sexes as compared to normal controls. Computed Chi square values between normals and patients on this trait are given in Table 6, which reveal a significant difference. One point which merits mention is that, with the exception of main line C, none of the other main lines (D, B, and A) show any significant difference between schizophrenics in both sexes as compared to normal controls. Computed Chi square values between normals and patients on this trait are given in Table 6, which reveal a significant difference. One point which merits mention is that, with the exception of main line C, none of the other main lines (D, B, and A) show any significant difference between schizophrenics in both sexes as compared to normal controls. Computed Chi square values between normals and patients on this trait are given in Table 6, which reveal a significant difference. One point which merits mention is that, with the exception of main line C, none of the other main lines (D, B, and A) show any significant difference between schizophrenics in both sexes as compared to normal controls. Computed Chi square values between normals and patients on this trait are given in Table 6, which reveal a significant difference. One point which merits mention is that, with the exception of main line C, none of the other main lines (D, B, and A) show any significant difference between schizophrenics in both sexes as compared to normal controls. Computed Chi square values between normals and patients on this trait are given in Table 6, which reveal a significant difference. One point which merits mention is that, with the exception of main line C, none of the other main lines (D, B, and A) show any significant difference between schizophrenics in both sexes as compared to normal controls. Computed Chi square values between normals and patients on this trait are given in Table 6, which reveal a significant difference.

Position of axial triradii:

The percentage frequencies of axial triradii at different levels in these samples is set out in Table 2. The frequency of type t is overwhelmingly dominant among the males of control series, t is highest among schizophrenic males while occur-
Table 1

Percentage distribution of palmar main line C

| Group          | Sex | Palms | Nodal Terminations | Ulnar | Radial | Prox | Abs |
|----------------|-----|-------|--------------------|-------|--------|------|-----|
|                |     |       |                    | (5,6,7) (9,10,11) (X, x) | (o)   |
| Schizophrenics |     |       |                    |       |        |      |     |
| Male           | Rt  | 64.13 | 28.32              | 7.54  |        |      |     |
| (n=53)         |     |       |                    |       |        |      |     |
| Male           | Lt  | 69.80 | 20.75              | 9.43  |        |      |     |
| Female         | Rt  | 66.97 | 34.51              | 8.49  |        |      |     |
| (n=27)         |     |       |                    |       |        |      |     |
| Female         | Lt  | 59.24 | 33.32              | 7.40  |        |      |     |
| M + F          | R + L | 61.10 | 33.32              | 5.55  |        |      |     |
| (n=80)         |     |       |                    |       |        |      |     |
| Controls       |     |       |                    |       |        |      |     |
| Male           | Rt  | 40.00 | 53.33              | 2.22  | 4.44   |      |     |
| (n=45)         |     |       |                    |       |        |      |     |
| Male           | Lt  | 62.22 | 33.33              | 2.22  | 2.22   |      |     |
| Female         | Rt  | 51.11 | 43.33              | 2.22  | 3.33   |      |     |
| (n=94)         |     |       |                    |       |        |      |     |
| Female         | Lt  | 64.71 | 23.41              | 2.94  | 2.94   |      |     |
| M + F          | R + L | 54.41 | 39.70              | 1.47  | 4.41   |      |     |
| (n=78)         |     |       |                    |       |        |      |     |

Table 2

Percentage frequencies of axial triradii

| Groups       | Sex | Palms | Types |
|--------------|-----|-------|-------|
|              |     |       | t     |
|              |     |       | t'    |
|              |     |       | t''   |
| Schizophrenics |     |       |       |
| Male         | Rt  | 50.00 | 50.00 |
| (n=50)       |     |       |       |
| Male         | Lt  | 54.00 | 42.00 |
|              | R + L | 52.00 | 46.00 |
| Female       | Rt  | 59.33 | 29.17 |
| (n=24)       |     |       |       |
| Female       | Lt  | 45.83 | 50.00 |
|              | R + L | 52.08 | 39.58 |
| M + F        | R + L | 52.03 | 43.92 |
| (n=74)       |     |       |       |
| Controls     |     |       |       |
| Male         | Rt  | 84.09 | 11.36 |
| (n=44)       |     |       |       |
| Male         | Lt  | 79.54 | 13.63 |
|              | R + L | 81.82 | 12.50 |
| Female       | Rt  | 76.47 | 23.53 |
| (n=34)       |     |       |       |
| Female       | Lt  | 61.76 | 32.36 |
|              | R + L | 69.11 | 27.94 |
| M + F        | R + L | 76.28 | 19.23 |
| (n=78)       |     |       |       |

Table 3

Mean distribution of maximal add angle

| Groups          | Sex | Palms | Mean | ± S.E. |
|-----------------|-----|-------|------|--------|
| Schizophrenics  |     |       |      |        |
| Male            | Rt  | 40.90 | 3.30 |
| (n=50)          |     |       |      |        |
| Male            | Lt  | 43.30 | 1.40 |
| Female          | Rt  | 41.80 | 1.50 |
| (n=24)          |     |       |      |        |
| Female          | Lt  | 43.42 | 2.12 |
| M + F           | R + L | 42.38 | 2.08 |
| (n=74)          |     |       |      |        |
| Controls        |     |       |      |        |
| Male            | Rt  | 42.32 | 1.55 |
| (n=44)          |     |       |      |        |
| Male            | Lt  | 43.00 | 2.70 |
| Female          | Rt  | 44.03 | 1.02 |
| (n=34)          |     |       |      |        |
| Female          | Lt  | 45.65 | 1.36 |
| M + F           | R + L | 44.84 | 1.18 |
| (n=78)          |     |       |      |        |

Maximal add angle:

Table 3 lists the mean maximal add angle in schizophrenics and control groups. Both the sexes of schizophrenics as compared to normals record a lower mean add angle on both hands, either considered separately or together. However, the t value in respect of the trait fails to record any significant difference between schizophrenics and control groups.

The a-b ridge count:

Means of a-b ridge counts of patients and control groups are given in table 4. The schizophrenics show a comparatively lower ridge count. Significant bisexual difference is found only among schizophrenics. The Chi square values for females and pooled sample between patients and normals were also found to be significant.
Table 4

Mean distribution of a-b ridge counts

| Groups     | Sex  | palms | Mean  | ± S.E. |
|------------|------|-------|-------|--------|
| Schizophrenics | Male | Rt    | 37.14 | 0.85   |
|             |      | Lt    | 37.81 | 0.81   |
|             |      | R + L | 74.95 | 0.83   |
|             | Female | Rt    | 33.55 | 1.42   |
|             |      | Lt    | 35.04 | 1.30   |
|             |      | R + L | 68.59 | 1.36   |
|             | M + F | R + L | 71.77 | 1.09   |

Table 5

Percentage distribution of palmar flexion creases

| Groups     | Sex  | palms | SRBC | DRBC | TRBC |
|------------|------|-------|------|------|------|
| Schizophrenics | Male | Rt    | 10.91| 80.00| 9.09 |
|             |      | Lt    | 12.73| 80.00| 7.27 |
|             |      | R + L | 11.82| 80.00| 8.18 |
|             | Female | Rt    | 36.36| 51.51| 12.12|
|             |      | Lt    | 24.24| 66.66| 9.09 |
|             |      | R + L | 30.30| 59.09| 10.61|
|             | M + F | R + L | 18.75| 72.16| 9.09 |

Controls

| Groups     | Sex  | palms | SRBC | DRBC | TRBC |
|------------|------|-------|------|------|------|
| Male       | Rt    | 20.00 | 64.44| 15.56|
| (n=55)     |      | Lt    | 22.22| 66.67| 11.11|
|            | R + L | 21.11 | 65.56| 13.33|
| Female     | Rt    | 2.94  | 64.70| 32.35|
| (n=34)     |      | Lt    | 5.88 | 70.59| 23.53|
|            | R + L | 4.41  | 67.65| 27.94|
| M + L      | R + L | 13.92 | 66.46| 19.62|

Table 6

Values of test of significance

| Line C | Axial | X value | a-b Palmar flexion |
|--------|-------|---------|--------------------|
|        | angle | t value | ridge count crease |
|        | atd   |         |                    |
| Bimanual Variation: |
| Schizophrenics | 0.85 | 2.42 | 0.66 | 0.57 | 0.18 |
| Controls | 0.36 | 2.68 | 0.62 | 0.77 | 1.54 |
| Bisexual Variation: |
| Schizophrenics | 1.61 | 3.52 | 0.17 | 4.00* | 10.43* |
| Controls | 0.43 | 6.21* | 0.89 | 0.47 | 11.99* |

Variation between schizophrenics and normal controls:

Schizophrenic male

X

Normal male 11.73* 25.34* 0.18 0.21 5.33

Schizophrenic female

X

Normal female 1.45 4.06 1.03 3.59* 18.66*

Schizophrenic

X

Normal 11.76* 21.78* 0.52 2.19* 8.9*

* indicate statistically significant at 5.0% level of probability.

Discussion

The results obtained in this study reveal that in the C main line endings of palm, schizophrenic patients and normals exhibit significant differences. Our results with regard to palmar main line however
are not in agreement with the earlier observation of Singh (1967), Kurien et al (1978), Rothhammer et al (1971), and Karmakar and Malhotra (1981), who noted that in the main line endings, schizophrenics and normals behave alike. It would be worthwhile to mention here that most of these authors used the main line index rather than direct main line terminations. With the exception of main line C, none of the other palmar main line (D,B and A) show any significant difference between schizophrenics and normals in the present study.

Regarding the position of axial triradius, the present findings show dominance of distal axial triradius among patients and extend support to the earlier observations made by Karmakar and Malhotra (1981) regarding existence of significant variation between the schizophrenics and the normals with regard to the trait.

Our results with respect to mean maximal atd angle record a rather lower mean count in schizophrenics than normal controls. It is noteworthy that with respect to the incidence of this trait in patients, our results are at variance with those of Rothhammer et al (1971) as well as Karmakar and Malhotra (1981), who reported marked difference between the patients and controls. However, the present series is in agreement with Singh (1967), who noted insignificant differences between both the sexes of schizophrenics and normals.

In the present study, with regard to a-b ridge count, while males among patients and controls show insignificant variation, females and pooled sample (males and females) show significant differences. However, in contrast to present results, Singh (1976) and Rothhammer et al (1971) found no difference in a-b ridge counts. Karmakar and Malhotra (1981) however noted significant variation in both the sexes between patients and normals.

The present findings that the incidence of single radial base crease is significantly higher among the schizophrenics as opposed to normals is highly noteworthy. Regarding palmar flexion creases, Bali (1971a) has reported significant association between crease and schizophrenia. In another study, Bali (1971b) also reported a higher frequency of single radial base crease and lower frequency of double radial base crease in schizophrenic patients. The findings of Eswaraiah (1978), Sharma (1989) and Jain (1991) also are in consonance with Bali's (1971a, 1971b) findings. It may be noted here that schizophrenic patients possess 'simian crease' in comparatively high frequency opposed to normals (Biswas & Bardhan, 1966).

The present study, as it is based on few palmar dermatoglyphic variables with a small sample size, prevents us from making any definite statement as to the diagnostic value of the palmar dermatoglyphics in schizophrenia. Our results, however, corroborate the earlier observations of marked differences in palmar dermatoglyphics between schizophrenic patients and normal controls. Of a greater diagnostic value in schizophrenics, perhaps, is the higher frequency of absent category of palmar C line termination, dominance of distal axial triradius, low a-b ridge count of palm, and higher frequency of single radial base palmar creases. Keeping in view the limitations of the present study, the present findings are encouraging. If confirmed by more detailed studies, these associations may have manifold significance. Further exploration in this potentially fruitful area are urgently needed to widen the scope of dermatoglyphics in medical disorders.

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