

Dermatoglyphic Study in Psoriasis

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Abstract—Dermatoglyphics or study of the palmar prints is constant and individualistic. Any genetic abnormality if there is inherited and is reflected in finger prints. Psoriasis is a common familial chronic papulosquamous inflammatory skin disorder of unknown cause. Dermatoglyphics of psoriasis has been studied by various authors all over the world. The present study was conducted with an aim to find any change in dermatoglyphics of psoriatics among Coastal Odia population. The study was carried out in the department of Anatomy, MKCG Medical College and Hospital, Berhampur, Odisha. It consists of 420 cases (210 psoriatics and 210 controls). Various parameters of dermatoglyphics like total ridge count, palmar patterns, atd angle and a-b ridge count were analyzed by using statistical calculations to find out the mean, standard deviation and standard error of mean. Significance of the statistical analysis was established after finding p value and t value. After complete analysis it is concluded from the study that there is definitely a statistically significant difference in the dermatoglyphic patterns of psoriatics and controls.

Keywords— Dermatoglyphics, psoriasis, ridge count, palmar pattern, atd angle.

I. INTRODUCTION

Dermatoglyphics or study of the palmar prints are constant and individualistic. It can be used in prediction of the genetic disorder (cumins and Midlo 1926)¹. If there is any abnormality in the genetic make-up of the parents it is inherited to the children and is reflected in dermatoglyphic pattern (Walker 1964)².

Psoriasis is a common familial chronic papulosquamous inflammatory skin disorder of unknown cause having an incidence of 1 to 3% throughout the world (Sutton 1948 and Bereston 1950)³. Psoriasis from its mode of inheritance appears to have both genetic and environmental etiologic factors Farber E.M. and Vanscott E.J. 1979)⁴. Higher concordance rates for the disease in monozygotic over dizygotic twins emphasizes the role of heredity in the pathogenesis of the disease (Farber et al 1974)⁵. Psoriasis is inherited by a single dominant gene on chromosome number '6' (Marks Ronald 1963)⁶.

Dermatoglyphics in psoriasis is carried by many workers all over the world⁸⁻¹⁶. This piece of work is carried out with an aim to study dermatoglyphics in psoriatics, compare it with that of unaffected general population of Coastal Odisha and to compare it with the works studied by other researchers and so to establish some particular changes in dermatoglyphic patterns in psoriasis.

II. MATERIALS AND METHODS

The present study was carried out in the department of anatomy M.K.C.G. Medical College, Berhampur.

120 male and 90 female psoriatic patients and similar number of controls of the corresponding sex with no family history of psoriasis were selected from the population of Southern Coastal Odisha. Extreme care was taken to rule out other diseases producing dermatoglyphic changes. The study was approved by the institutional ethical committee.

Procedure

The dermatoglyphic prints were taken by the "INK METHOD" described by Cummins and Midlo (1961)⁷. The prints of both the hands were taken on plane white papers and then they were subjected for detailed dermatoglyphic analysis with the help of magnifying hand lens and ridge counting was done with the help of sharp needle.

Parameters: 4 parameters were applied for the study.

1. **Total Ridge Count:** The total ridge count was calculated as the total of the ridges of all the ten fingers.
2. **'a-b' ridge count:** The ridge counting was done along a straight line that connects the digital triradius 'a' to triradius 'b'.
3. **The palmar pattern configuration:** A pattern is a group of ridges with a core. The palm has been divided into several anatomical areas to carry out dermatoglyphic analysis. They include the thenar, hypothenar and interdigital areas.
4. **The 'atd' angle:** The angle is formed by the lines drawn from the triradius 'a' to axial triradius 't' and from 't' to digital triradius 'd'.

Statistics: Parameters were analyzed to find out mean, SD, & SE. Parameters were confirmed by applying test of significance like 't' test.

Observations

TABLE I. Statistical calculation of total finger ridge count among psoriatics and controls.

Sex	Subject	\bar{x}	S.D	S.E of \bar{x}	t value	p	Remark
Male	PSORIATICS	165.8	26.0	2.37	3.68	0.001	S
	CONTROLS	153.2	27.1	2.47			
Female	PSORIATICS	154.4	25.7	2.71	3.6	0.001	S
	CONTROLS	133.0	20.7	2.18			
M+F	PSORIATICS	157	27.7	1.91	5.11	0.001	S
	CONTROLS	144.5	26.5	1.82			

TABLE II. Statistical calculation of a-b ridge count among psoriatics and controls.

SEX	Side	Subject	\bar{x}	S.D	S.E of \bar{x}	t value	p	Remark
M A L E	RT	PS	35.4	3.86	0.35	7.98	0.001	S
		CTRL	40	5.1	0.40			
F E M A L E	LT	PS	38.3	4.06	0.37	1.96	0.05	S
		CTRL	39.5	5.3	0.48			
F E M A L E	RT	PS	37.9	4.5	0.47	2.86	0.01	S
		CTRL	39.9	4.87	0.51			
F E M A L E	LT	PS	36.8	7.6	0.8	3.34	0.001	S
		CTRL	40.0	4.95	0.52			

TABLE III. Percentage wise distribution of palmar patterns in psoriatics and controls.

Areas	Psoriatic males	Control males	Psoriatic females	Control females
Th & ID-1	27	20	8.8	6.1
ID-2	9.5	8.7	4.4	4.4
ID-3	67.9	45.4	46.1	42.2
ID-4	55.8	31.2	62.2	44.4
Hyp	24.1	17	33.3	33.8

TABLE IV. Statistical calculation of a.t.d. angle among psoriatics and controls.

Sex	Side	Subject	\bar{x}	S.D	S.E OF \bar{x}	t value	p	Remark
Male	RT	Psoriatics	42.3	6.3	0.58	0.53	0.3	NS
		controls	41.9	5.17	0.47			
Male	LT	Psoriatics	41.1	4.36	0.4	1.74	0.04	NS
		controls	40.1	4.6	0.42			
Female	RT	Psoriatics	41.9	4.83	0.51	2.47	0.02	S
		Controls	44.1	6.95	0.73			
Female	LT	Psoriatics	41.7	5.69	0.60	5.6	0.001	S
		controls	46.4	6.45	0.68			

III. DISCUSSION

Table I:

Total Ridge Count was found to be significantly increased in male patients (165.8) in comparison to control males (153.2). Similarly the value was increased in case of female patients (psoriatics- 145.4, controls- 133). Same finding was observed while taking the combined series to account (psoriatics- 157, controls- 144.5). On statistical analysis, the P value being more than 0.001, the observations are significant at 0.1% level in all the groups. These findings coincide with Verma K.C. (1980)⁸, Singh P.K. (1983)⁹ and Miljenko C. (2016)¹⁰.

Table II:

a-b ridge count: the mean value is decreased in male psoriatics(R-35.4, L-38.3) in comparison to male controls(R-40, L- 39.5). In psoriatic females(R- 37.9, L-36.8) also this value is lower than that of control females(R- 39.9, L- 40.0). These findings coincide with the study of Nagar K.S.(1981)¹¹, Singh P.K.(1983)⁹ and Dehankar R.(2013)¹².

Table III:

In male psoriatics the percentage of palmar patterns is increased in all areas (Th & ID1- 27, ID2- 9.5, ID3-67.9, ID4-55.8 & Hypothenar24.1) in comparison to control males (Thenar & ID1- 20, ID2-8.7, ID3- 45.4, ID4-31.2 &

Hypothenar-17). In female psoriatics the percentage of palmar patterns was increased in thenar, 3rd and 4th interdigital areas (Thenar & ID1- 8.8, ID3- 46.1, ID4-62.2) in comparison to controls (Thenar & ID1- 6.1, ID3-42.2, ID4- 44.4). These findings coincide with the studies by Kreiger T. (1934)¹³, Verbov J.L. (1968)¹⁴, Singh P.K. (1983)⁹, Kumar P.(2010)¹⁵ and Dehankar R. (2013)¹².

Table IV:

The mean value for atd angle are increased in psoriatic males(R-42.3, L-41.1) than control males(R-41.9, L-40.1). However the increase is not significant. These findings coincide with the findings of Gibbs R.C.(1968)¹⁶ and Kumar P.(2010)¹⁵ but against the observations by Singh P.K.(1983)⁹, Dehankar R.(2013)¹² and Miljenko C.(2016)¹⁰.

However among psoriatic females there is a significant decrease in the mean value of atd angle (R-41.9, L-41.7) compared to control females(R-44.1, L-46.4). The findings coincide with observations of Singh P.K. (1983)⁹, Dehankar R.(2013)¹² and Miljenko C.(2016)¹⁰.

IV. SUMMARY

- The total finger ridge count is significantly increased in all psoriatic groups.
- The a-b ridge count is significantly decreased in psoriatic males and females.
- The frequency of palmar patterns is increased in all areas in psoriatic males; but in female psoriatics it is increased in thenar, 3rd and 4th interdigital areas.
- 'atd' angle shows significant decrease in the mean value for female psoriatics only

V. CONCLUSION

The present study concludes that:

- There is definitely a statistically significant difference in the dermatoglyphic pattern in psoriatic patients as compared to non affected general population.
- There is very less or no regional variation in psoriatic dermatoglyphic patterns in subjects of coastal Odisha as compared to those of other regions.

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