International Journal of Medical Research Professionals
P-ISSN: 2454-6356; E-ISSN: 2454-6364
DOI: 10.21276/ijmrp

IJMRP

Original Research Article.

Study of Dermatoglyphics Patterns among Patients of Psoriasis: An Institutional Based Study

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ABSTRACT

Introduction: The study of patterns of fingerprints is important in anthropology and medical genetics, chiefly because of their diagnostic usefulness. These patterns may represent the genetic makeup of an individual and therefore his/her predisposition to certain diseases. The present study has been undertaken to study dermatoglyphic patterns in cases of Psoriasis.

Material and Methods: The present study was carried among cases of clinically diagnosed Psoriasis. Dermatoglyphic printing has been done using older and fairly good "Indian Ink Method". This method enabled us to record the complete imprints of palm including Palmar surfaces of all five digits in one attempt. These prints were studied with the help of a magnifying lens for observation under different heads. p value <0.05 is considered statistically significant.

Results: The present study found that loop pattern was seen in 192 (64%), out of which 179 were ulnar and 13 radial, followed by whorls 71 (23.67%) and arches 37 (12.33%). Increase in Loop and decrease in Whorls is statistically significant. Loop pattern was more over first, third and fifth digit of each hand and first digit of left hand. Maximum whorls were noticed over second digit of right hand and fourth digit of each hand.

Conclusion: The dermatoglyphic features of this study can be of help as a diagnostic tool to point towards the provisional diagnosis and person at risk but it still requires more elaborate study in large number of patient.

Keywords: Dermatoglyphics; Fingerprints; Hereditary Diseases; Psoriasis.

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Article History:

Received: 15-04-2018, **Revised:** 10-05-2018, **Accepted:** 27-05-2018

Access this article online	
Website: www.ijmrp.com	Quick Response code
DOI: 10.21276/ijmrp.2018.4.3.059	

INTRODUCTION

Dermatoglyphics is the study of dermal ridges and the patterns formed by them.[1] The dermatoglyphic science is based on two major facts; first, the ridges are slightly different for different fingers and no two persons, not even monozygotic twins, show exactly similar fingerprint patterns, and second, the ridges are permanent throughout life and they survive superficial injuries and also environmental changes after the 21st week intra-uterine life. Fingerprint patterns of dermal ridges can be classified into three major groups i.e. arches, loops, and whorls.[2]

The study of patterns of fingerprints is important in anthropology and medical genetics, chiefly because of their diagnostic usefulness.[3] Epidermal ridges have been useful in the diagnosis of hereditary diseases. Fingerprint studies in psoriasis will help in genetic counseling in relation to these diseases. It is assumed that genes take place in the development of dermal ridges and any gene predisposition to a familial disorder will alter dermatoglyphic pattern.[1] These patterns may represent the genetic makeup of an individual and therefore his/her predisposition to certain diseases.[4] Dermatoglyphics has shown specific patterns in various diseases with genetic predisposition like Psoriasis, Vitiligo, Alopecia areata, Icthyosis, Darier`s disease. [3]

Psoriasis is a multisystem inflammatory disease with predominantly skin and joint involvement. Pathogenesis is multifactorial, involving dysregulated inflammation and genetic associations. Beyond the physical dimensions of disease, psoriasis has an extensive emotional and psychosocial effect on patients; it can result in stigmatization, poor self-esteem, and increased stress, affecting social functioning and interpersonal relationships.[5] The present study has been undertaken to study dermatoglyphic patterns in cases of Psoriasis.

MATERIALS AND METHODS

The present observational, cross sectional hospital based study was carried in the department of Anatomy, SMS Medical College, Jaipur and 30 cases were taken from OPD of Dermatology for commencement of the study. Inclusion Criteria was adults (30-60 years) of either sex, clinically diagnosed case of Psoriasis. Patient with diseases affecting dermatoglyphics pattern like, leprosy, burn cases, bronchial asthma, celiac disease, CHD; type of profession destroying the normal dermatoglyphics like welders, chemical factory workers were excluded from the study. Dermatoglyphic printing has been done using older and fairly good "Indian Ink Method" (Cummins and Midlo, 1961).

The hands were washed with soap and water and the humidity was removed with the help of ether which also removes the greasy material. A small dab of printer's ink was squeezed out on inking slab and was spread with the help of a roller into a thin film. Palm was carefully smeared uniformly with inked roller to cover the whole area of palm to be printed for examination.

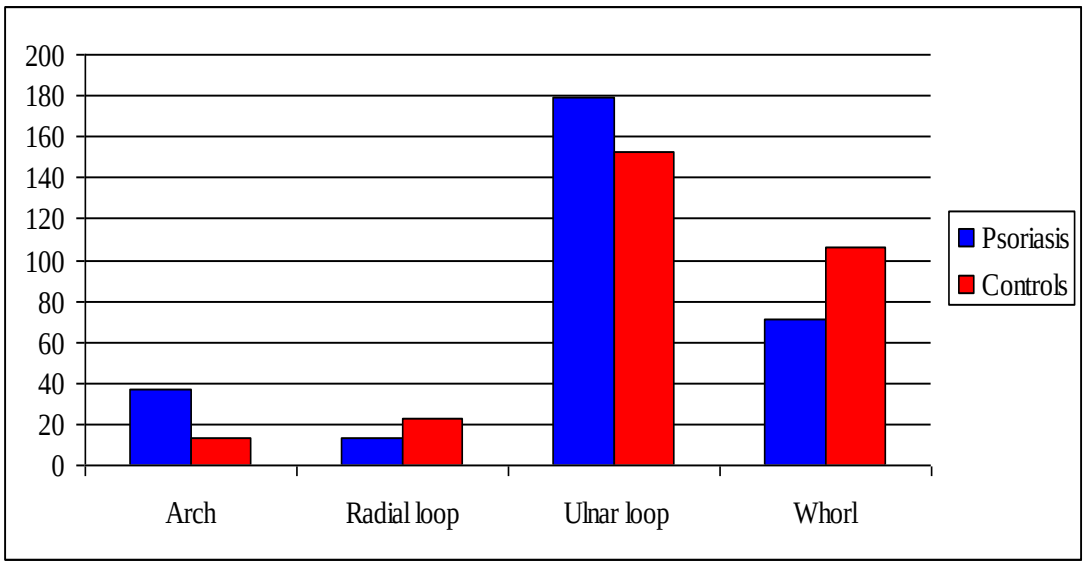
Paper was set over the round bottle and the partly open fingers and palm are successively rolled over with some pressure, permitting the bottle and paper to move forward, so that whole of the palm and plain or dab finger prints are properly obtained. Plain or dab prints in Cummins method have been recorded separately without rotation of digits by contact of ball of finger. The rolled finger prints were taken by rotation of the fingers both in inking and printing in order to obtain complete impression of finger tips (ball). The paper is laid edge to edge, upon rigid plain surface of smooth table top of glass sheet. Inking is completed by placing the edge down on the ink film and rolled till the opposite margin comes in contact with surface of inking slab, Next the finger is pressed edge down against paper margin and rolled to opposite edge in a manner, similar to that in inking. The knowledge of anatomical adaptation to rotation of hand and arm is applied to minimize awkward manipulations. Thus, thumb has to be placed with the ulnar edge downward and rolled toward the body and other digits are placed with the radial edge downward and rolled away from the body. This method enabled us to record the complete imprints of palm including Palmar surfaces of all five digits in one attempt.

These prints were studied with the help of a magnifying lens for observation under different heads. p value <0.05 is considered statistically significant.

RESULTS

Significant association was found between ulnar loops and whorls of both group. (graph 1 and table 1). Table 2 and 3 shows dermatoglyphic patterns of Psoriasis. Loop pattern was seen in 192 (64%), out of which 179 were ulnar and 13 radial, followed by whorls 71 (23.67%) and arches 37 (12.33%). Increase in Loop and decrease in Whorls is statistically significant. Loop pattern was more over first, third and fifth digit of each hand and first digit of left hand. Maximum whorls were noticed over second digit of right hand and fourth digit of each hand.

Total Ridge Count (TRC): Range of ridge count was 16-238 and TRC 139 in psoriasis.



Graph 1: Dermatoglyphic patterns of Psoriasis and normal Control group.

Table 1: Dermatoglyphic patterns of Psoriasis and normal Control group.

	A			C			RL			UL			W			
	RH	LH	Total	RH	LH	Total	RH	LH	Total	RH	LH	Total	RH	LH	Total	Grand Total
	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	
Psoriasis	18 (6)	19 (6.3)	37 (12.3)	0 (0.0)	0 (0.0)	0 (0.0)	9 (3.0)	4 (1.3)	13 (4.3)	82 (27.3)	97 (32.3)	179* (59.7)	41 (13.7)	30 (10.0)	71* (23.7)	300 (100)
Controls	4 (1.3)	9 (3.0)	13 (4.3)	0 (0.0)	5 (1.7)	5 (1.7)	13 (4.3)	10 (3.3)	23 (7.7)	83 (27.7)	70 (23.3)	153 (51)	50 (16.7)	56 (18.7)	106* (35.3)	300 (100)
Statistical evaluation	**		**													

RH: Right Hand; LH: Left Hand; UL: Ulnar loop; RL: Radial loop; A: Arch; W: Whorl

Table 2: Dermatoglyphic patterns of Psoriasis of right hand of subjects

	Right Hand					
	Th	**I**	**M**	**R**	**L**	**Total**
A	2	7	3	5	1	18
C	0	0	0	0	0	0
RL	0	5	0	2	2	9
UL	23	8	22	10	19	82*
W	5	10	5	13	8	41*
Total	30	30	30	30	30	150

UL: Ulnar loop; RL: Radial loop; A: Arch; W: Whorl; Th: Thumb; I: Index Finger; M: Middle Finger; R: Ring Finger; L: Little Finger

Table 3: Dermatoglyphic patterns of Psoriasis of left hand of subjects

	Left Hand					
	Th	**I**	**M**	**R**	**L**	**Total**
A	3	7	5	2	2	19
C	0	0	0	0	0	0
RL	0	3	1	0	0	4
UL	23	11	21	15	27	97*
W	4	9	3	13	1	30*
Total	30	30	30	30	30	150

UL: Ulnar loop; RL: Radial loop; A: Arch; W: Whorl; Th: Thumb; I: Index Finger; M: Middle Finger; R: Ring Finger; L: Little Finger

Table 4: Total loops (Right hand +left Hand)

Parameters compared	**P value**	**Results**
Control v/s Psoriasis (RL and UL)	0.042227	Significant

Table 5: Total Whorls (Right hand +left Hand)

Parameters compared	**P value**	**Results**
Control v/s Psoriasis	0.0379	Significant

DISCUSSION

Dermatoglyphics have been analyzed since ancient times. Harold Cummins first coined the word in 1926. The dermatoglyphic pattern makes their appearance as early as 10 weeks of intrauterine life. Development of ridges was found to be affected by genetic and environmental factors. Once formed these pattern do not change throughout one's life.[6] Dermatoglyphics as a diagnostic tool is well established in a number of other diseases having strong hereditary or genetic basis.[7-12]

These observations suggested that hereditary or environmental factors acting in early gestation may have played a role in the genesis of the disease.[13] The present study found that loop pattern was seen in 192 (64%), out of which 179 were ulnar and 13 radial, followed by whorls 71 (23.67%) and arches 37 (12.33%). Increase in Loop and decrease in Whorls is statistically significant. Loop pattern was more over first, third and fifth digit of each hand and first digit of left hand. Maximum whorls were noticed over second digit of right hand and fourth digit of each hand. Distribution of arches was almost similar to that found in controls. Comparing controls vs psoriasis, P value for total Loops was coming out as 0.04227 and thus making it statistically significant. Comparing whorls of controls vs psoriasis, the P value came out as 0.0379 thus making it statistically significant. In Psoriasis patients it is interesting to note that there is increase in Loop patterns approximately 64% with predominance over third and fifth digit of each hand and first digit of left hand in this series.

There was decrease in whorl pattern among the patients. Pour-Jafari H et al[3] studied the frequencies of various types of skin ridges of the first phalanx in patients with eczema, psoriasis and alopecia areata. The results showed that frequencies are not statistically different according to types of fingers, hands (left or right) and sexes as well. But they are significantly different in various case groups and between case groups and control group. It was concluded that frequencies of various patterns of skin ridges differ in eczema, psoriasis and alopecia areata from normal population.

Verma KC et al[14] studied forty cases of psoriasis and same number of controls were subjected to dermatoglyphic studies. Control cases did not show any arch pattern on 4th and 5th fingers. Increased incinerate of whorl pattern was observed in psoriatic females and incidence was decreased in psoriatic males. Whorl pattern was more commonly seen on 4th finger, and more on right hand in psoriatic cases. Total ridge count was found to be decreased in psoriatic males. Earlier also in a study carried out by Kapur TR et al[15] to correlate the specific dermatoglyphic pattern in the three dermatoses, viz Psoriasis, Vitiligo and Alopecia areata and control. They found significant changes in dermatoglyphic pattern in three diseases with that of controls.

The difference in preponderance when compared to our study may attribute to the different type disease study, small series of patients and ethnic variation in Indian subcontinent.

CONCLUSION

The present study found that loop pattern was seen in 192 (64%), out of which 179 were ulnar and 13 radial, followed by whorls 71 (23.67%) and arches 37 (12.33%). Increase in Loop and decrease in Whorls is statistically significant. Loop pattern was more over first, third and fifth digit of each hand and first digit of left hand. The dermatoglyphic features of this study can be of help as a diagnostic tool to point towards the provisional diagnosis and person at risk but it still requires more elaborate study in large number of patient**.**

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Source of Support: Nil.

Conflict of Interest: None Declared.

Cite this article as: K C Dagal, Neha Dagal, Rohin Garg. Study of Dermatoglyphics Patterns among Patients of Psoriasis: An Institutional Based Study. Int J Med Res Prof. 2018 May; 4(3):269-72. DOI:10.21276/ijmrp.2018.4.3.059