Original Research Paper

Volume - 10 | Issue - 11 | November - 2020 | PRINT ISSN No. 2249 - 555X | DOI : 10.36106/ijar

Anatomy

FINGER RIDGE PATTERNS IN PSORIASIS PATIENTS

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ABSTRACT Psoriasis is a chronic inflammatory disorder of the skin. In India the prevalence of psoriasis varies from 0.44 to 2.8%, it is twice more common in males compared to females. Beyond the physical dimensions of disease, psoriasis has an extensive emotional and psychosocial effects on patients. Dermatoglyphics is the study of epidermal ridges and grooves on palm and sole which is formed during the third or fourth month of foetal life which remain unchanged till death. The present study is an attempt to correlate the differences in fingertip patterns of psoriasis patients with controls. In this study 54 male patients and 100 controls are included from a tertiary care teaching institution in North Kerala. There were 46.12% whorls, 48.31% ulnar loops, 1.66% radial loops and 3.91% arches among the patients. Among the controls it was 42.8%, 51.2%, 2.4% and 3.6% respectively. When the fingers are individually considered thumb and second and fourth fingers have more whorls in both cases and controls. Of these the increase of whorls on the fourth finger (ring finger) on right side among patients is statistically significant. Pattern intensity index, Dankmeijer's index and Furuhata's index are reported. The findings of the study are suggestive of a possible trend and an association of finger print patterns with patients suffering from psoriasis.

KEYWORDS :

INTRODUCTION

Psoriasis is a chronic inflammatory disorder of the skin that is mediated by T cells, dendritic cells and inflammatory cytokines. This is a multisystem inflammatory disease with predominantly skin and joint involvement. Many cellular and genomic approaches have been used to assess the alterations of gene expression in psoriasis. A handful of psoriasis-susceptibility genes have been identified so far. Their role in disease pathogenesis and the effect of environmental triggers on these genes is yet to be explored. One susceptibility variant for psoriasis that maps to human chromosome 17q25 has been shown to result in the loss of an enhancer binding site for the RUNX (runt-related transcription factor) family of transcription factors.[1] More evidences on the genetic predisposition of this disease are now available. In India the prevalence of psoriasis varies from 0.44 to 2.8%, it is twice more common in males compared to females, and most of the patients are in their third or fourth decade at the time of presentation.[2] Beyond the physical dimensions of disease, psoriasis has an extensive emotional and psychosocial effects on patients; it can result in stigmatization, poor self-esteem and increased stress, affecting social functioning and interpersonal relationships.[3]

Dermatoglyphics is a study of configurations of epidermal ridges on certain body parts, namely, palms, fingers, soles, and toes. The pattern of ridges and grooves on the palms and soles are genetically determined. Hence some medical disorders, which have a genetic influence for their causation, show variations in dermatoglyphic patterns.[4] There are reports on dermatoglyphic patterns varying in psoriatic patients as early as 1934.[5] In that study it was found that there was more frequency of whorls on the fourth digit and more frequent patterns in the left fourth interdigital area. In another study a significant increase in the incidence of whorls in the right fourth digit was reported.[6]

An increased frequency of whorls over thumb of both hands in females and over ring finger of both hands in males were reported. This study also reported loop as the dominating pattern. The presence of whorls in the left hand was also higher in patients than the controls.[7] Another study showed that the whorl pattern was increased on the third finger of male patients and on the fifth finger of both hands of female patients. The arched pattern was decreased in the second phalanges.[8] There were reports of significant increase of loop patterns in male psoriatics on the first and fourth digits, whereas female psoriatics showed significant increase in whorl patterns mainly on the first digit. Arch patterns were significantly reduced in both the sexes.[9] Various dermatoglyphic pattern indices like Pattern intensity index, Dankmeijer's index and Furuhata's index were also reported.[10] There are a few more reports on variation in dermatoglyphic patterns in psoriasis.[11,12]

The objective of the present study is to investigate on the fingertip features in psoriatic patients of north Kerala. This may bring information on probable genetic predisposition of this disease.

MATERIALS AND METHODS

This study was conducted in the Dermatology department of Government Medical College Calicut, Kerala, India. The study was conducted in 1997 and ethical approval was not mandatory at that time. However, the procedures were at par with Helsinki Declaration (2000). The psoriatic patients undergoing treatment either as outpatient or as inpatients were recruited to the study. There were 54 male and 16 female psoriatic patients in the study group. They were in the age group of 12 to 75 years. Patients whose palm prints could not be taken because of disease was excluded. Since there were only 16 female patients, they were excluded in the present report. There were 100 matching controls. A Performa was used to collect details on age, sex, family history and other related parameters. Fingertip patterns are taken on paper using standard ink method. Hands were cleaned with soap and water before printing. Rolled prints of the fingertips were taken. The prints were labelled and analysed manually. The present report was based on the dermatoglyphic features of the fingertips. Patterns were classified into whorls, ulnar loops, radial loops and arches according to Galton with modifications suggested by Schaumann and Alter.[13,14] Pattern intensity index = [(2x % whorl + % loop) / 10], Dankmeijer's index = [(% arches / % whorl) x 100] and Furuhata's index = [(% whorl / % loop) x 100] [15] were also calculated and presented.

RESULTS

In this study 54 male psoriatic patients and 100 matching controls are included. There is no positive family history of psoriasis in the study group. There were 46.12% whorls, 48.31% ulnar loops, 1.66% radial loops and 3.91% arches among the patients. Among the controls it was 42.8%, 51.2%, 2.4% and 3.6% respectively (Table I).

Ulnar loop is the most frequent pattern in both cases and controls.

When the fingers are individually considered thumb and second and fourth fingers have more whorls in both cases and controls. Third and fifth fingers have high percentage of ulnar loop pattern in both groups which has influenced the total percentage. Of these the increase of whorls on the fourth finger (ring finger) on right side among patients is statistically significant. Highest percentages of radial loops and arches were seen in second left finger (index finger) in both groups.

Table I. Frequency Of Fingertip Patterns In Male Psoriatic Patients And Controls In Percentage

		Whorls		Ulnar Loops		Radial Loops		Arches	
Digits	Side	Controls	Patients	Controls	Patients	Controls	Patients	Controls	Patients
	Left	59	46.3	40	50	0	3.7	1	0
I	Right	68	63	31	35.2	0	1.9	1	0
	Mean	63.5	54.65	35.5	42.6	0	2.8	1	0
	Left	44	53.7	30	29.6	15	7.4	11	9.3
II	Right	44	57.4	40	31.5	9	3.7	7	7.5
	Mean	44	55.55	35	30.55	12	5.55	9	8.4
	Left	34	33.3	58	61.1	0	0	8	5.6
III	Right	33	29.6	61	61.1	0	0	6	9.3
	Mean	33.5	31.45	59.5	61.1	0	0	7	7.45
	Left	53	63	46	33.3	0	0	1	3.8
IV	Right	53	70.4*	46	27.8	0	0	1	1.9
	Mean	53	66.7	46	30.55	0	0	1	2.85
	Left	17	16.7	83	81.5	0	0	0	1.9
V	Right	23	27.8	77	72.2	0	0	0	0
	Mean	20	22.25	80	76.85	0	0	0	0.95
Total in percentage		42.8	46.12	51.2	48.31	2.4	1.66	3.6	3.91

- **Pearson Chi-Square, significant at 5% level (0.029)**

Pattern intensity index is 13.92 among controls and 14.22 among patients. Dankmeijer's index is 8.41 among controls and 8.52 among patients. Furuhata's index is 79.85 and 92.24 respectively.

DISCUSSION

Dermatoglyphics can be used as a tool in preclinical diagnosis of genetically determined diseases. Its usefulness in psoriasis has been reported by many workers. A positive family history of 49% is reported in a study[6] while such an observation was not noticed in the present study. In this study patients have more ulnar loops than whorls which is concordant to other reports.[7,9,16] Increased frequency of whorls on fourth finger as reported in this study is similar to other studies.[5,9] Increased frequency of whorl pattern on first finger (thumb) as reported in a study[9] is contrary to the present observation. In the present study more arches were seen on the second finger which is similar to other reports.[9]

Pattern intensity index is a measure of complexity of the patterns. More number of whorls certainly gives a higher value. In this study loop pattern was dominating and hence the lower values. Dankmeijer's index is a comparison of arches to whorls. Since arches were lower in number the values were also lower. Furuhata's index is a ratio of whorl to loop. Since whorls were less than loop pattern, the value was less than hundred. The higher values in patients were an indication of increased whorl pattern which was more complex in nature. However, it was less than 100 and shows the preponderance of loop pattern.

The findings of the study were suggestive of a possible trend and an association of finger print patterns with patients suffering from psoriasis. Psoriasis and dermatoglyphics are two instances where more genes are involved in its genesis. The variation of patterns from controls and the presence of comparatively higher percentage of complex pattern is an indication of genetic drift in psoriasis patients. The present study emphasizes the significance of the application of dermatoglyphics in medicine and pathology.

CONCLUSION

Ulnar loop is the most frequent pattern in both cases and controls. The increase of whorls on the fourth finger (ring finger) on right side among patients is statistically significant. Highest percentages of radial loops and arches are seen in second left finger (index finger) in both cases. Furuhata's index shows more complex patterns in psoriasis patients. Although the dermatoglyphic configuration cannot be considered alone in making a diagnosis, several dermatoglyphic features when combined can be used to confirm a suspected diagnosis or to detect a disorder that might otherwise be overlooked or discovered only later.

Acknowledgements

The authors are grateful to Dr. Rajarajeswari (Former Principal, Government Medical College, Calicut for her valuable support and encouragements.

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