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Original Research Article

STUDY OF PALMAR DERMATOGLYPHICS IN PATIENTS WITH ECZEMA IN THE AGE GROUP BETWEEN 20-50 YEARS IN BOTH SEXES

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ABSTRACT

Introduction: The word eczema seems to be originated in 543AD and is derived from the Greek word Ekzein meaning 'to boil forth or to effervesce'. Clinically, acute eczema is associated with marked erythema, superficial papules and vesicles which easily excoriate and lead to crusts. Chronic eczema is composed of rather faint erythema, infiltration and scaling. Eczema belongs to a group of complex disorders, where the development of the phenotype results from a complex interplay of different susceptibility genes and their polymorphic variants with environmental factors. Since dermatoglyphic traits are genetically determined this study was done to identify a genetic marker for the disease and predicting the individuals chance of acquiring the disease.

Materials and Methods: The present study was carried out on 220 patients of eczema and 150 normal healthy subjects. Quantitative and qualitative analysis were done. Arithmetic mean and standard deviation were calculated for quantitative analysis,' Z' test was applied. the 'Chi' square test was applied for qualitative analysis.

Results: We found statistically significant differences in certain parameters used for the study.

Conclusion: These parameters may help us in identifying the individual susceptibility to acquire Eczema.

KEY WORDS: Dermatoglyphics, Eczema , Palmar, Ridge count.

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INTRODUCTION

The term Dermatoglyphics [from the Greek, Derma = skin, glyphics = carvings] is the scientific term coined by Prof. Harold Cummins. Cummins is "Father of dermatoglyphics"[1]. The analysis of dermal ridges and their configurations by studying prints of them is called Dermatoglyphics. The term is also used as a collective name for all the features of ridged skin. The skin patterns are studied from prints or impressions [2]. Eczema is a pattern of inflammatory responses of the skin, which can be defined either clinically or histologically. Clinically, acute eczema is associated with marked erythema, superficial papules and vesicles which easily excoriate and lead to crusts. Chronic eczema is composed of rather faint

erythema, infiltration and scaling[3].The word eczema seems to be originated in 543AD and is derived from the Greek word Ekzein meaning 'to boil forth or to effervesce. The complications of eczema include : chronicity, cosmetic disfigurement, secondary infection, systemic dissemination and sometimes, are associated with asthma, which severely compromises the quality of life and in rare cases may be lethal[4]. Dermatoglyphics is a growing discipline and its easy and ready applicability renders it as a useful tool to the clinician. The relevance of dermatoglyphics is not to diagnose, but to prevent by predicting a disease; not for defining an existing disease, but to identify people with genetic predisposition to develop certain diseases[5]. Eczema has a genetic basis, if a dermatoglyphic marker of eczema can be found, it will be of immense clinical significance.Hence need for a study in palmar dermatoglyphics in patients with Eczema.

Hence the objectives of our study were To find out various dermatoglyphic patterns in eczema patients and compare them with normal individuals thus evaluating the significance of dermatoglyphics in eczema.

MATERIALS AND METHODS

Informed consent was taken from patients as well as the normal subjects for taking the hand prints and studying them.

The modified Purvis Smith method was applied. Patients were asked to wash both their hands with soap and water so as to remove any oil or dirt. Black duplicating ink (Kores, Bombay) was smeared on both hands one by one and prints were taken by rolling the hands from wrist creases to finger tips on the roller covered with bond paper.

The study was carried with maximum sample of 220 patients of eczema confirmed by clinical history, examination, in the age group of 20-50 years of either sex (133 males and 87 females) obtained from Department of DVL, BLDEU'S Shri B.M.PATIL Medical college, Hospital and Research Centre, Vijayapura .and 150 normal healthy subjects (75 males and 75 females) of identical age group and either sex served as control taken from apparently healthy staff of BLDEU'S Shri B.M. PATIL Medical college, Hospital and Research Centre , Vijayapura. All the data was analyzed qualitatively and quantitatively.

Fig. 1: Illustration shows Hand print of a male subject showing Palmar pattern, finger tip pattern, simian line and atd angle.

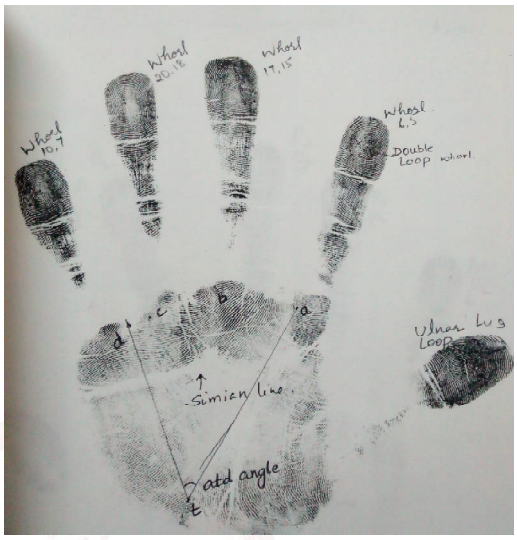
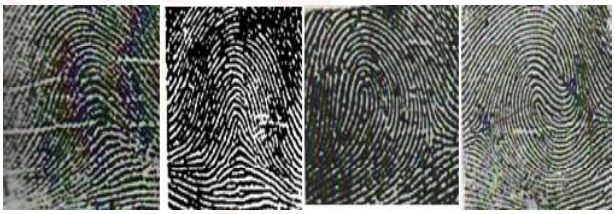


Fig. 2: Illustration Shows different Finger Tip Patterns.



Simple arch Tented Arch Radial/Ulnar loop Whorl

Fig. 3: Illustration shows Method of ridge counting.

Method of Data Collection

Sample Size: It was expected to consider a sample of 220 eczema patients for the desired conclusion with prevalence rate of 5.5%[6] at 3% margin of error and 95% confidence level using the statistical formula as follows. $n=(1.96)^2 P(1-P) \div d^2$ Where n = sample size, P = prevalence rate, d=margin of error[7].

Type of Study: It is a prospective cross sectional study. The qualitative study included finger print patterns (whorls, radial loops, ulnar loops and arches) and palmar pattern (simian line and Sydney line) as seen in fig 1 and 2. The quantitative study included total finger ridge count

(TFRC), absolute finger ridge count (AFRC) as seen in fig 3, mean 'atd' angle. For qualitative analysis, the 'Chi' square test was applied whenever necessary. Statistical analysis for quantitative analysis, the arithmetic mean and standard deviation were calculated, 'Z' test was applied. P' value is probability rate at 0.05 level of significance for the corresponding degree of freedom. P<0.05 is significant. P>0.05 is not- significant.

RESULTS

Qualitative analysis

Table 1: Frequency of digital patterns in male & female study groups and controls (both hands).

Pattern	Study Group				Control Group				Z-Test		P-Value		Inference	
	No male	No female	% male	% female	No male	No female	% male	% female	male	female	male	female	male	female
Arches(A)	79	36	5.94	4.14	45	55	6	7.33	0.13	0.27	0.9	0.79	NS	NS
Radial Loops (L_r)	34	18	2.56	2.07	20	13	2.67	1.73	0.49	0.64	0.62	0.52	NS	NS
Ulnar Loops (L_U)	697	577	52.41	66.4	359	399	47.87	53.2	0	0	1	1	NS	NS
Whorls (W)	520	238	39.1	27.39	326	283	43.47	37.73	0	0.27	1	0.79	NS	NS

Table 2: Presence of Sydney line in both sexes.

Sex	Hands	Study Group (%)	Control Group (%)	Z-Test	P-Value	Inference
Male	Right	1 (0.75%)	5(6.66%)	2.08	P < 0.038	Significant
	Left	1 (0.75%)	5(6.66%)	2.08	P < 0.038	Significant
Female	Right	2 (2.20%)	0 (0%)			
	Left	0 (0.00%)	7 (9.33%)			

Table 3: Presence of Simian line.

Sex	Hands	Study Group (%)	Control Group (%)	Z-Test	P-Value
Male	Right	1 (0.75%)	1 (1.33%)	0.38	P = 0.708
	Left	0 (0.00%)	1 (1.33%)	---	---
Female	Right	1 (1.14%)	0 (0.00%)		
	Left	0 (0.00%)	0 (0.00%)		

Quantitative analysis

Table 4: Mean total finger ridge count (TFRC).

Sex	Study Group Mean (SD)	Control Group Mean (SD)	Z-Test	P-Value	Inference
Male	140 (46.79)	158 (48.23)	2.63	P < 0.008	Significant
Female	141 (40.90)	113 (37.72)	4.87	P < 0.0001	Highly Significant

Table 5: Mean absolute finger ridge count (AFRC).

Sex	Study Group Mean (SD)	Control Group Mean (SD)	Z-Test	P-Value	Inference
Male	187 (81.18)	221 (89.16)	2.79	P =0.006	significant
Female	181 (79.49)	148 (61.63)	3.1	P < 0.0001	Highly Significant

Table 6: Mean 'atd' Angle.

		Present study					Vatsala et al (2013)		
Sex	Hands	Study Group Mean (SD)	Control Group Mean (SD)	Z-Test	P-Value	Inference	Study group	Control group	Inference
M	Right	42 (4.83)	40 (4.25)	2.99	P < 0.0001	Highly Significant	39.75	42.35	Significant
M	Left	42 (4.52)	41 (5.00)	1.43	P < 0.154	NS	41.25	44.81	Significant
F	Right	41 (4.83)	41 (5.23)	0	P < 1	NS	41	41.4	NS
	Left	42 (4.35)	41 (4.95)	1.46	P < 0.146	NS	38.2	45.8	Significant

DISCUSSION

Skin is one of the largest organs of the body. Friction ridges are found on the digits, palms and soles [8]. Friction ridges are in their definitive form in the foetus before birth. Once this blue print has been established in the stratum basale of the epidermis in the foetus, it does not change except for the injury, disease or decomposition after death[9]. The genes showing a statistically significant association with eczema are Filaggrin gene, Interleukin-4, Interleukin-13,Mast cell chymase, Serine Protease inhibitor Kazal-type 5[10]. In present study, we tried to determine significant palmar

dermatoglyphic parameters in case of eczema in age group between 20-50 years and whether the parameters can be used for screening purpose.

In Table 1 shows Ulnar loops were predominant. While Radial loops were the least common pattern,

Vatsala et al (2013) study shows ulnar loop as predominant pattern in study group with P<0.0002 and radial loops as the least common pattern in males and arches in female cases[11].

Jafari et. al (2013) found ulnar loops as most common pattern i.e. in 51.95% of the patients with eczema and radial loops as least common pattern i.e. in 2.25 % of the patients with eczema[12].

His study correlated with our study in type of finger prints in each hand. Cusumano et.al (1983) found a significant increase in whorl pattern in female, not in male atopic patients when compared to sex matched control groups p<.0025. This increase was significant only in Caucasian females when compared to sex and race matched controls p<.0005[13].

Table 2 shows that the Sydney line is very rare. 0.75% of study group in males in both hands had Sydney line as compared to 6.66% of controls in both hands. It is statistically significant. (P<.038). However it is found that 6% of Normal individuals have Sydney line[14].

Table 3 shows that the Simian line is also very rare 4% of Normal individuals have Simian line[15].

Table 4 shows that the Mean TFRC in Male patients was lower as compared to male control group P<.008. The Mean TFRC in female patients was higher as compared to Female control group P<.0001.

Table 5 shows that the Mean AFRC in Male patients was lower as compared to male control group. P=.006. Mean AFRC in female patients was higher as compared to Female control group. P <0.0001).

We could not get the similar studies to compare the TFRC and AFRC in the literature. Monteseirin et al studied in a group of 30 atopic patients that 'atd' angle was lower in the right hand with P<.05. In the left hand he found many individual values that are identical, thus statistical methods cannot be applied satisfactorily[16].

CONCLUSION

Dermatoglyphics has been studied extensively in chromosomal disorders, single gene disorders and those disorders whose genetic basis is not clear. Dermatoglyphic studies have proved quite useful at least in three fields medico-legal, anthropological and clinical.

In present study, we tried to determine significant palmar dermatoglyphic parameters in case of eczema in age group between 20-50 years and whether these parameters can be used for screening purpose i.e. to identify people with genetic predisposition to develop eczema.

Conflicts of Interests: None

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