A Study Of Palmar Dermatoglyphics In Leprosy in Bhavnagar District.

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Abstract : Dermatoglyphics, the ridged skin covering our palms and sole, are not only found on human beings. All primates have ridged skin, and it can also be found on the paws of certain mammals and on the tails of some monkey species. The drag against the ridges when feeling the texture of a surface heightens the intensity of stimulation of the nerve endings. The sample consists of 100 cases of leprosy in the age group of 18 to 60 years. Fingerprints and palm prints were taken, using the Ink and Pad method, described by Harold Cummins and Midlo. The dermatoglyphics of 100 leprosy cases are studied in the age group of 18 to 60 year. All cases are selected from Bhavnagar district & Taluka places of Bhavnagar District. Out of 100 cases 70 Case of Multibacillary type, (40 Male & 30 Female) and 30 case of Paucibacillary type (16 Male & 14 Female) are compared with the control of different age group 18 to 60 years, (74 Male & 26 Female). there was no statistically significant difference observed in finger print pattern and in between male & female in present study in MB, PB and control.

Key-words: Palmar Dermatoglyphics, Leprosy, genetic

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INTRODUCTION: Dermatoglyphics, the ridged skin covering our palms and sole, are not only found on human beings. All primates have ridged skin, and it can also be found on the paws of certain mammals and on the tails of some monkey species. The drag against the ridges when feeling the texture of a surface heightens the intensity of stimulation of the nerve endings.

Sir Francis Galton[1], the cousin of Sir Charles Darwin, was a scientist with a wide range of interests covering anthropology, geology, biology, heredity and eugenics, publishing some 240 written works, including some fifteen books.

The importance of dermatoglyphics is due to its permanence; once formed it remain unchanged throughout life, so these are age stable and there is no change in their arrangement and structure after birth, they are influenced by insults during early fetal life. The inheritance of most of dermatoglyphic features confirm to a polygenic system with individual gene contributing a small additive effect[2]

According to Schaumann and Alter[2], the process of dermal ridge formation begins with the formation of fetal volar pads. These are mound-shaped formations of mesenchymal tissue elevated over the end of the most distal metacarpal bone on each finger, in the interdigital areas just below the fingers, and on the hypothenar and thenar areas of the palms and soles. Secondary pads are found in other areas such as in the center of the palm and on the proximal phalanges. The fingertip formations of volar pads are first visible in the sixth to seventh week of development.

It is well accepted that the pattern of leprosy and determine by the host cells mediated immunity (CMI), showing tuberculoid leprosy with high intact cellular immunity and lepromatous leprosy with absence or very low cell mediated immunity[3] (Ridley and jopling 1996).The genetic susceptibility to develop different types of leprosy has been studied world over and there is now enough evidence in favor of possible genetic influence on leprosy[4,5]. A HLA – linked genetic control of host response to

mycobacterium leprae observe by devries et al in 1976[6].

The study of dermatoglyphic pattern in leprosy[5-11]has been done by few workers and it was not done in Bhavnagar region, therefore I have done the study of dermatoglyphic patterns in leprosy in Bhavnagar region.
The present study deals with finger and palmar patterns in an individual with Leprosy.

MATERIAL AND METHODS: The sample consists of 100 cases of leprosy in the age group of 18 to 60 years. All cases are Indian belonging to Bhavnagar Region, Gujarat. The patients were selected from out patient Department of Skin & VD, Sir.T.Hospital Bhavnagar, M.P. Shah Leprosy Hospital.Bhavnagar. IRB permission was taken and inform consent of all subjects were taken.

Out of 100 cases, 70 cases (40 males and 30 females) are of multibacillary leprosy and 30 cases (16 males and 14 females) are of paucibacillary leprosy.

The cases taken into consideration had a long incubation period, gradual onset and included both the groups multibacillary and paucibacillary leprosy.

The patients are classified on Ridlay and Jopling scale[3]. The tuberculoid and borderline tuberculoid leprosy grouped as paucibacillary leprosy and lepromatous and borderline lepromatous leprosy grouped as multibacillary leprosy. The cases were diagnosed by dermatologist of Sir.T. Hospital, Bhavnagar. 100 Control of different age group, 74 males and 26 females were selected. Control group consists of MBBS students of Govt. medical college, Bhavnagar and others from Bhavanagar city, not having any family history of Leprosy, or any other congenital or hereditary illness. Fingerprints and palm prints were taken, using the Ink and Pad method, described by Harold Cummins and Midlo[12,13]

RESULTS: Analysis was carried out for both qualitative and quantitative characteristics, namely the Frequencies of finger print pattern including ulnar, radial loops, Whorls and arches.

Palm and Fingerprint pattern were recorded in each group. Fingerprint patterns were noted in Leprosy and Control group. Both in male and female group. (Ref. Table no 1 to 8), four basic type of fingerprint pattern were noted. Whorl, Ulnar loop, Radial loop, and Arch. A comparison of fingerprint pattern in percentage was done in leprosy patient and control group (Ref. table no 1-8).

Table: 1 : Comparison of fingerprint pattern in total leprosy case and control.

Table: 2: Comparison of fingerprint pattern in MB and PB.

Fingerprint pattern	MB-Leprosy n=70	PB- Leprosy n=30	P value
Whorl	46.43%	42%	>0.05
Ulnar loop	46.14%	52%	>0.05
Radial loop	2.14%	1%	>0.05

Fingerprint pattern	Total Leprosy case, n=100	Control n=100	P value
Whorl	45.1%	34.1%	>0.05
Ulnar loop	47.9%	60.5%	>0.05
Radial loop	1.8%	1.7%	>0.05
Arch	5.2%	3.7%	>0.05
Arch	5.29%	5%	>0.05

Table:3 : Comparison of fingerprint pattern in MB and control

Fingerprint pattern	MB-Leprosy n=70	Control n=100	P value
Whorl	46.43%	34.1%	>0.05
Ulnar loop	46.14%	60.5%	>0.05
Radial loop	2.14%	1.7%	>0.05
Arch	5.29%	3.7%	>0.05

Table :4 : % of Comparison of fingerprint pattern in PB and control.

Fingerprint pattern	PB-Leprosy n=30	Control n=100	P value
Whorl	42%	34.1%	>0.05
Ulnar loop	52%	60.5%	>0.05
Radial loop	1%	1.7%	>0.05

Arch	5%	3.7%	>0.05

Table : 5 : % of Comparison of fingerprint pattern in MB Male and control Male

Fingerprint pattern	MB Male n=40	Control Male n=74	P value
Whorl	45%	35.54%	>0.05
Ulnar loop	47.25%	59.06%	>0.05
Radial loop	2.5%	1.89%	>0.05
Arch	5.25%	3.51%	>0.05

Table : 6 : % of Comparison of fingerprint pattern in PB Male and control Male

Fingerprint pattern	PB Male n=16	Control Male n=74	P value
Whorl	47.5%	35.54%	>0.05
Ulnar loop	43.12%	59.06%	>0.05
Radial loop	1.25%	1.89%	>0.05
Arch	8.13%	3.51%	>0.05

Table :7 : % of Comparison of fingerprint pattern in MB Female and control Female

Fingerprint pattern	MB Female n=30	Control Female, n=26	P value
Whorl	48.33%	30.38%	>0.05
Ulnar loop	44.67%	64.24%	>0.05
Radial loop	1.67%	1.15%	>0.05
Arch	5.33%	4.23%	>0.05

Table :8 : Comparison of fingerprint pattern in PB Female and control Female

Fingerprint pattern	PB Female n=14	Control Female,n=26	P value
Whorl	35.71%	30.38%	>0.05
Ulnar loop	62.15%	64.24%	>0.05
Radial loop	0.71%	1.15%	>0.05
Arch	1.43%	4.23%	>0.05

DISCUSSION: In multibacillary leprosy patients, the fingerprint pattern showed decrease in the number of whorls (30.8%) and increase frequency of the loops (68.4%) whereas the control had increase number of whorls (44.8%) and decrease number of loops (54.7%) respectively, which is highly significant (p<0.001).

However, when the finger print patterns of paucibacillary leprosy patients were compared with multibacillary leprosy patients, it was observed that there was increase frequency of whorls (69.4%) and decrease frequency of loops(30.3%) in paucibacillary leprosy patients(p<0.001) which is highly significant, where as there was increase frequency of loops (68.8%)and decrease frequency of whorls (30.8%) in Multibacillary leprosy patients (p<0.001) which is also highly significant.

P.E. Natekar & F.M .Desouza[16] in their study of Digital dermatoglyphics in leprosy showed That the finger print pattern showed predominance of whorls (69.4%) and decrease in the loops (30.3%) in paucibacillary leprosy patients, whereas the controls had decreased number of whorls (44.8%) and increased number of loops (54.7%) respectively, which is highly significant (p<0.001). Since the number of arches both in the leprosy and control groups were reduced in number, the differences were statistically insignificant

Enna et al[14] had reported significant smaller number of radial loops and larger number of whorls in leprosy. There was no significant difference between finger print patterns of both hands of patients and control.

Kapoor and verma[15] did not found significant difference between finger print pattern (whorls & loops) of patients and control.

The fingerprint pattern in present study are supported by Enna et al[14] & Kapoor and verma[15] as there was no statistically significant difference observed in finger print pattern in between male & female, and in MB, PB and control in present study (p>0.05).

CONCLUSION: A new diagnostic tool, the place of dermatoglyphics in medicine including many congenital disease is firmly established. Although there was no statistically significant difference observed in finger print pattern and in between male & female in present study in MB, PB and control. Dermatoglyphics analysis can be useful diagnostically to differentiate multibacillary,

paucibacillary leprosy and control. Knowing that the finger print and palm print have a genetic bases, it seems logical to suspect that the fraction of leprotic whose dermatoglyphics pattern differ substantially from normal pattern represent the genetically determined fraction of patient. Dermatoglyphic analysis can be extended to established correlation between dermatoglyphics and other congenital disease.

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