

A Case Study on Dermatoglyphics in Rheumatoid Arthritis



Biotechnology

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ABSTRACT

The various genetic and acquired disorders with genetic influence can be predicted by dermatoglyphics. The aim of the study is to diagnose the rheumatoid arthritis with the help of fingerprints and palmprints. The samples were collected from the rheumatoid arthritis patients of the age group of 30- 45 years. The prints of both right hand and left hand of RA patients and control were taken on 100 GSM bond sheet by rolling finger technique with the application of kajal. In the RA group the DC, PC and TC was variable in both right hand and left hand where as in control it was normal. The ulnar loops were significantly present in right and little finger of left hand of RA patients compared with control. The total fingerprint ridges were more numerous in right and left hand of RA group. The possible correlation between RA and dermatoglyphics may enable dermatoglyphics as a marker tool in the diagnosis of RA.

INTRODUCTION

Rheumatoid arthritis

Rheumatoid arthritis (RA) is an autoimmune disease that causes severe pain, stiffness and inflammation in joints. It depends upon many factors and it may be different from person to person. The Rheumatoid arthritis can occur at any age but the studies show that it usually appear in mid to late adulthood. It is more common in females as compare to males. The RA disease can be inherited in families. The most significant genetic risk factors for RA is due to variations in human leukocyte antigen (HLA) genes. HLA-DRB1 is one of the several genes in the HLA complex that have been associated with rheumatoid arthritis. The HLA genes proteins help the immune system in distinguishing its own proteins from proteins made by foreign invaders such as viruses and bacteria. The variation in HLA-DRB1 gene causes chronic abnormal inflammation that primarily affects the joints. The risk of RA is more in the identical twins (twins that share 100% of their genes) than non- identical twins (twins that share 50% of their genes).

Dermatoglyphics

Dermatoglyphics is the scientific study of pattern configuration of epidermal ridges on lips, palm and soles. The Fingerprints of every individual are the unique characteristic features which differ amongst in parents and their children, siblings and even in the identical twins. The fingerprints are developed approximately from 4th to 10th week of gestation. There are as many as 150 individual ridge characteristics on the average fingerprint. The dermal ridges and configuration are not changed by age, development and environmental changes in the post-natal life. The fingerprints are considered as a reliable source of information because of its uniqueness, permanence classifiability and genotype. This property makes fingerprints as a biometric identifier. Therefore the various genetic and acquired with genetic influence can be predicted by dermatoglyphics.

There is an association between RA and dermatoglyphics. The possible correlation between RA and dermatoglyphics may enable dermatoglyphics as a marker tool in the diagnosis of RA. The present study has been undertaken to find out the possibility that the fingerprints and palmprints play an important role in the diagnosis of RA.

MATERIALS AND METHODS

The study was conducted on RA patients of the age group 30-45 years. The study of dermatoglyphics does not depend on age similarity unless it is affected by any occupational hazard. Therefore the normal healthy person of various age groups was taken as control. The prints were imprinted on bond paper with the help of kajal, magnifying glass, pencil, scale and tissue paper. The prints of all RA patients and control were taken on 100 GSM bond sheet by rolling finger technique with the application of kajal. Each digit were coated with kajal and then rolled one by one on a glossy paper. The same procedure was followed for coating the palm to show palmar creases and the interdigital areas. The prints were analysed by magnifying hand lens in both right and left palm separately. The data were tabulated and comparison was done with control to evaluate the dermatoglyphics pattern.

RESULTS AND DISCUSSION

In the RA group, the distal crease (DC), proximal crease (PC), thenar crease (TC) was variable in both right hand and left hand where as in control it was normal. The hypothenar region and thenar region was identified with many criss cross in RA patients where as in control it was normal (Table 1).

The frequency of double loop whorl in RA group was observed in pointing finger and middle finger of right hand and left hand respectively. The ulnar loops were significantly present in right and little finger of left hand of RA patients compared with control (Table 2). The total fingerprint ridges were more numerous in right and left hand of RA group (Table 3).

Table 1:

RA	DISTAL CREASE	PROXIMAL CREASE	THENAR CREASE	HYPOTHENAR CREASE	THENAR REGION	ANGLE atd
LEFT HAND	VARIABLE	VARIABLE	VARIABLE	MANY CRISS CROSS	MANY CRISS CROSS	40°
RIGHT HAND	VARIABLE	VARIABLE	VARIABLE	MANY CRISS CROSS	MANY CRISS CROSS	40°
CONTROL						
LEFT HAND	VARIABLE	NORMAL	NORMAL	NORMAL	NORMAL	40°
RIGHT HAND	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	41°

Table 2:

RA	THUMB	POINTING FINGER	MIDDLE FINGER	RING FINGER	LITTLE FINGER
LEFT HAND	ULNAR LOOP	RADIAL LOOP	DOUBLE LOOP WHORL	ULNAR LOOP	ULNAR LOOP
RIGHT HAND	ULNAR LOOP	DOUBLE LOOP WHORL	MODIFIED ULNAR LOOP	ULNAR LOOP	ULNAR LOOP
CONTROL					
LEFT HAND	ULNAR LOOP	SIMPLE ARCH	ULNAR LOOP	SINGLE LOOP WHORL	SINGLE LOOP WHORL
RIGHT HAND	ULNAR LOOP	TENTED ARCH	ULNAR LOOP	ULNAR LOOP	ULNAR LOOP

Table 3:

RA	THUMB	POINTING FINGER	MIDDLE FINGER	RING FINGER	LITTLE FINGER	TOTAL
LEFT HAND	8	24	16+9	24	17	98
RIGHT HAND	16	14+26	28	20	17	121
CONTROL						
LEFT HAND	9	0	11	12+8	14+10	64
RIGHT HAND	8	0	12	14	8	42

CONCLUSION

It could be inferred from the present study that dermatoglyphics in an anatomical, non-invasive, inexpensive tool which play an important role in the diagnosis of RA because several dermatoglyphics characteristics in patients with RA are different from those in normal persons.

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