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Research Paper

A Dermatoglyphics Study of Polycystic Ovary Syndrome – A case Study

Biotechnology

KEYWORDS : dermatoglyphics, polycystic ovary syndrome,

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ABSTRACT

The aim of this study was to analyze the pattern present on palm print of a patient suffering from Polycystic Ovary Syndrome (PCOS)

The word "Dermatoglyphics" comes from the two words Derma- skin, Glyphic-curves. The ridge formation of the skin of an individual begins to appear during 3rd or 4th month of fetal development. The fingerprints or the ridges on the palm and its pattern are determined by genes in embryonic life. Polycystic ovary syndrome (PCOS) was first reported by Stein and Leventhal who reported women suffering from amenorrhea, enlarged or swollen ovaries with multiple cysts and hirsutism. Its marked expressivity, ambiguous list of associated conditions, and hence possible risk to a women's health remains a genetic and diagnostic threat. Distinguish landmark had been found in the palm print of

INTRODUCTION

DERMATOGLYPHICS

There is the assumption that many gene, both autosomal and sex chromosomal takes part in the function of formation of the dermatoglyphics character, thus the possibility of gene predisposing the onset of the disease is very high. This gene also has the influence in the ridges and grove pattern on the finger as well as on the creases. The relevance of dermatoglyphics is not to diagnose but to prognosis, not according to the existence / study of disease but to the identification of people with the genetic predisposition to develop certain diseases. In the other word Dermatoglyphics can be associated with the use is screening cheaply. The population at the risk of onset of disease and showing the onset of symptoms can be kept at watch. These however require the proof that dermatoglyphics character may furnish a guide to disease. Dermatoglyphics is the scientific study of the grooves and ridges pattern present on the extreme part of the body like palm, sole, lips, toes. The study of dermatoglyphics can be traced to 1892. The Father of dermatoglyphics is Sir Francis Galton. Dermatoglyphics is the study of palm prints and the finger prints and this term was coined by Cummins. The finger prints are the imprints of the epidermal ridges which are formed in the early gestation period and remain permanent during whole life. Dermatoglyphics patterns have polygenic inheritance and are affected by the environmental factor in the uterus . The fingerprints are not disturbed unless the skin is damaged to the depth of $1mm^3$ but the healing of the damaged produce the same patterns thus also proving that these patterns are under genetics control. There are various genetics disease for which the genes are directly involved and its abnormalities in the genetic makeup is either inherited to the children or is expressed in the individually in the dermatoglyphics pattern. Thus the dermatoglyphics pattern as a diagnostic aid is well established which have strong hereditary basis. It is usually analysed for various character in fingerprints like the arches, loop, whorls, he ridge counts also have important implication where the ridges count vary from finger to finger. The position of the palmer triradius and the atd angle too has genetic predisposition to develop certain disease.

POLYCYSTIC OVARY SYNDROME (PCOS)

Polycystic ovary syndrome (PCOS) was first reported by Stein and Leventhal who reported women suffering from amenorrhea, enlarged or swollen ovaries with multiple cysts and hirsutism. Its marked expressivity, ambiguous list of associated conditions, and hence possible risk to a women's health remains a genetic and diagnostic threat. It is now a common, heterogeneous, heritable endocrine disorder affecting women throughout their life. It is characterized by polycystic ovaries and hyperandrogenism. However, there is considerable differences in appearance among individuals. Although unnecessary for diagnosis, the affected individuals commonly show the presence of insulin resistance and hyper-insulinemia and are prone to diabetes and cardiovascular diseases. Thus, this syndrome adversely affects the cardiovascular and endocrine system.

Both genetic and environmental factors add to PCOS. Obesity, aggravated by poor dietary choices and lethargy, worsens PCOS in affected individuals. The part of infectious agents or toxins present in the environment are unproven. Although several loci have been suggested as PCOS genes including CYP11A (helps in synthesis of cholesterol and other steroids), the follistatin gene, the insulin gene, and most importantly, a region near the insulin receptor, the evidence supporting linkage is not surprising. The strongest speculation can be made for the region near the insulin receptor gene (but not involving this particular gene). However, the susceptible gene at chromosome 19p13.3 remains to be analyzed. Till date, no particular gene has been identified that causes or extensively contributes to the development of a PCOS phenotype.

A case study among European women showed the presence of three variants rs3797179 (SRD5A1), rs12473543 (POMC), and rs1501299 (ADIPOQ) nominally associated with PCOS. However, they remained unconvinced after correction for multiple testing, not a single variant replicated in a sufficiently powered meta-analysis. Variants in the FBN3 gene (rs17202517 and rs73503752) were associated with smaller waist circumferences, and variant rs727428 in the SHBG gene was associated with lower sex hormone-binding globulin levels.

A genome wide association study conducted amongst Han Chinese and has identified a loci on chromosomes 2p16.3, 2p21, and 9q33.3. Some of these results were replicated in European allies, namely the chromosome 2p21 THADA and chromosome 9p33.3 DENND1A susceptibility loci. The sharing of the same susceptibility genes among populations suggests that PCOS is an ancient disorder that originated before humans migrated out of Africa.

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MATERIAL METHOD:

The PCOS sample was collected from one of the private gynecology clinic, and the written consent was obtained. The material used for collecting fingerprint and palm print was- A4 sheet, kajal, protractor, magnifying glass.

The kajal was applied gentely on the entire palm of the subject including the wrist crease and digits. Then the sheet of paper was placed on the foam rubber pad on the table top. The subject palm was placed on the paper in such a way that first the wrist and then whole palm and spreaded finger print was formed. The foam pad was used to fill the concavity of the palm when the pressure is applied. The whole palm was removed with the jerk, so that the print does not get smudged. For taking the finger prints, rolling finger print was used for the same reason.

OBSERVATION:

SL NO.	TYPE OF FINGER	DERMAL PATTERN (LEFT HAND)	RIDGE COUNTS (LEFT HAND)	DERMAL PATTERN (RIGHT HAND)	RIDGE COUNTS (RIGHT HAND)
1	THUMB	ULNAR LOOP	19	ULNAR LOOP	16
2	POINTING FINGER	SIMPLE ARCH	------	ULNAR LOOP	8
3	MIDDLE FINGER	ULNAR LOOP	20	ULNAR LOOP	8
4	RING FINGER	ULNAR LOOP	17	MODIFIED ULNAR LOOP	13
5	LITTLE FINGER	ULNAR LOOP	12	ULNAR LOOP	8

TABLE NO.1:- PCOS LEFT HAND AND RIGHT HAND

SL NO.	TYPE OF FINGER	DERMAL PATTERN (LEFT HAND)	RIDGE COUNTS (LEFT HAND)	DERMAL PATTERN (RIGHT HAND)	RIDGE COUNTS (RIGHT HAND)
1	THUMB	CENTRAL POCKET WHORL	12	ULNAR LOOP	12
2	POINTING FINGER	ULNAR LOOP	11	ULNAR LOOP	10
3	MIDDLE FINGER	TENTED ARCH	----	ULNAR LOOP	11
4	RING FINGER	MODIFIED ULNAR LOOP	10	ULNAR LOOP	08
5	LITTLE FINGER	ULNAR LOOP	09	ULNAR LOOP	11

TABLENO.2 :- CONTROL LEFT HAND AND RIGHT HAND

SL NO.	STUDY OF PALM PRINTS	GENETICS RELATION (LEFT HAND)		GENETICS RELATION (RIGHT HAND)	
1	DISTAL CREASE	VARIABLE		VARIABLE	
2	PROXIMAL CREASE	VARIABLE		VARIABLE	
3	THENAR CREASE	VARIABLE		VARIABLE	
4	THENAR REGION	PRESENCE OF CRISS CROSS		PRESENCE OF CRISS CROSS	
5	HYPOTHENAR REGION	PRESENCE OF CRISS CROSS	PRESENCE OF LOOP	PRESENCE OF CRISS CROSS	PRESENCE OF LOOP
6	a	PRESENT	NORMAL	PRESENT	NORMAL
7	b	PRESENT	SHIFTED TOWARD 'RING FINGER'	PRESENT	SHIFTED TOWARD 'RING FINGER'
8	c	ABSENT	VARIABLE	PRESENT	NORMAL
9	d	PRESENT	NORMAL	PRESENT	NORMAL
10	t	PRESENT	NORMAL	ABSENT	VARIABLE
11	Angle atd	33°		-----	

TABLE NO.3 -PCOS : LEFT HAND PALM AND RIGHT HAND PALM

SL NO.	STUDY OF PALM PRINTS	GENETICS RELATION (LEFT HAND)		GENETICS RELATION (RIGHT HAND)	
1	DISTAL CREASE	NORMAL		NORMAL	
2	PROXIMAL CREASE	NORMAL		NORMAL	
3	THENAR CREASE	NORMAL		VARIABLE	
4	THENAR REGION	NORMAL		NORMAL	
5	HYPOTHENAR REGION	NORMAL		NORMAL	
6	a	PRESENT	NORMAL	PRESENT	NORMAL
7	b	PRESENT	NORMAL	PRESENT	NORMAL
8	c	PRESENT	NORMAL	PRESENT	NORMAL
9	d	PRESENT	NORMAL	PRESENT	NORMAL
10	t	PRESENT	VARIABLE	PRESENT	VARIABLE
11	Angle atd	40°		41°	

TABLE NO.4 - CONTROL: LEFT HAND PALM AND RIGHT HAND PALM

CONCLUSION:

This paper is a case study in the order to get bioindicator specific patterns for identification of PCOS . We need to have more than 3000 PCOS palm prints and finger prints from the Indian population and statistical analysis needed to be done for all patterns, landmarks on the palm, the ridge counts of the individual finger, the total ridge count (absolute) is needed. This case study helps to identify different types of landmarks on the palm prints and finger prints.

1) Right Hand Finger Print of the PCOS Patients;

a) All the finger had ulnar loop, (in ring finger modified ulnar loop was present)

b) The total ridge count is approximately normal.

2) Left Hand Finger Print of the PCOS Patients;

a) In this all finger except Pointing Finger has the Ulnar Loop. Pointing Finger had Simple Arch.

b) The total ridge count is above the normal.

3) Right Hand Palm Study:

a) All the three main crease – Distal, Proximal and Thenar are Variable

b) Hypothenar and Thenar region has criss crosses all over the palm, Hypothenar has a loop.

c) Triradius 'b' is shifted toward the 'ring finger'

d) Triradius 't' is absent, hence angle atd cannot be measured

4) Left Hand Palm Study:

a) All the three main crease – Distal, Proximal and Thenar are Variable

b) Hypothenar and Thenar region has criss crosses all over the palm, Hypothenar has a loop

c) Triradius 'b' is shifted toward the 'ring finger'

d) Triradius 'c' is absent.

e) Angle atd =33°

REFERENCE

1. Alcorn M, Jarratt T, Martin W, Dodd B (1995). "Intensive group therapy: efficacy of a whole language approach". In B. Dodd (ed.), Differential Diagnosis and Treatment of Children with Speech Disorders (London: Whurr) 181–198. | 2. Baker E, Mcleod S (2004). "Evidence based management of phonological impairment in children". Child Language Teaching and Therapy 20, 261–285. | 3. Beery K, Buktenica N (1997). "Developmental Test of Visual-Motor Integration" (Toronto: Modern Curriculum). | 4. Blache S, Parsons C (1980). "A linguistic approach to distinctive feature learning". Language Speech and Hearing Services in Schools 11, 203–207. | 5. http://www.ncbi.nlm.nih.gov/pubmed/17185788 | 6. http://www.ncbi.nlm.nih.gov/pubmed/23375202 |