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The study of dermatoglyphics in hands of patients with pulmonary tuberculosis

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Abstract

Aim: find out various dermatoglyphic features in pulmonary tuberculosis patients and compare them with normal individuals and to see differences found are statistically significant or not.

Material and Method: The patients selected were diagnosed clinically as having pulmonary tuberculosis and by doing investigations like sputum positive test. Palms and fingers print recorded.

Results: There is decrease in total value of ulnar loops in Male Patients than Controls, Which is statistically Very highly significant. There is slight decrease in total value of Radial loops in Male Patients than Controls, Which is statistically not significant. There is increase in total value of Whorls in Male Patients than Controls, Which is statistically Very highly significant.

Conclusion: Dermatoglyphic patterns are genetically transmitted and Genetic contribution is one of the causes of pulmonary tuberculosis.

Keywords: dermatoglyphic, pulmonary tuberculosis

Introduction

In India, since ancient times till today the ridges on palms and fingers have been studied for prophecy and fortune telling. With the emergence of civilization this interest was replaced by a methodical and scientific study of these patterns. The fingerprints have been also used as identification feature by law enforcing authorities, anthropologists and geneticists. The dermatoglyphic science is based upon two major facts that a) The ridges are slightly different for fingers and no two persons, not even uniovular twins, show exactly similar finger print patterns. b) The ridges are permanent throughout life and survive superficial injury and also environmental changes after 21st week of intrauterine life ^[1]. The dermal ridge differentiation takes place early in fetal development. The resulting ridge patterns are genetically determined and influenced by environmental factors. Patterns once established never change throughout life ^[2] Specific dermatoglyphic traits were claimed to be inherited as dominant, incompletely dominant recessive, single gene or polygenic with complete or incomplete penetrance and variable expression of genes.

There is much economic burden of pulmonary tuberculosis on the family and nation, more prevalence among peoples. Functional mutants of mannose binding protein are associated with pulmonary tuberculosis, which plays important role in inheritance and epidermal ridge pattern is also determined by genetics ^[3]

Very little study has been conducted so far, as far as dermatoglyphics in pulmonary tuberculosis is concerned. Considering all above facts, the present study is under taken to find out various dermatoglyphic features in pulmonary tuberculosis patients and compare them with normal individuals and to see differences found are statistically significant or not.

Material and Method

The present study has been carried out on 200 individuals: 100 Patients having pulmonary tuberculosis. 72 males and 28 females; 100 Controls of same age group (20-45 yrs) and from same area. 72 males and 28 females. The patients selected for the study are from Krishna Institute of Medical Sciences, Hospital and Medical research Centre, Karad, Cottage Hospital, Karad, SKNMC & Hospital, Pune.

The patients selected were diagnosed clinically as having pulmonary tuberculosis and by doing investigations like sputum positive test. Controls are selected randomly without any respiratory problem or any symptoms related to pulmonary tuberculosis from medical students, staff members and paramedical staff including nurses from Krishna Institute of Medical Sciences, Hospital & Medical Research Center, Karad.

In the present study, required information was collected and entered in the prepared proforma

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before taking the prints. Subject was convinced for the procedure and idea behind taking prints, his or her written consent was taken, subject was made relaxed and co-operative for required movement of fingers. Palms and fingers were cleaned with soap and water to remove oily dirt, sweat and other dirt. Spirit was used to remove remaining oil and other dirt and keep the hand clean and dry. A dab of ink was applied on the porcelain tile and spread on slab evenly with the help of cotton gauge ball so that a thin layer of ink is formed on the tile surface. The hands were cleaned after taking the prints also.

The distal phalanges of the individual’s right hand were inked over the tile by firm pressure starting from thumb (ulnar to radial side). White crystal bond paper was kept on edge of the table for recording the finger print pattern. Rolled Fingerprints were obtained starting from thumb to little finger. The same procedure was followed for recording the fingerprints of left hand. Thus rolled fingerprints of both hands were obtained and recorded with care [9].

Palm prints of both hands were obtained after inking with the help of cotton gauge ball. A uniform film of ink was obtained on the tile with cotton gauge ball. Then with the help of same cotton gauge ball ink was spread uniformly on right hand. The hand was extended at wrist joint and touches the paper kept along with pressure pad beneath it on the table and then slowly whole of the hand was kept on the paper. Pressure was applied on the interphalangeal joints, head of metacarpals and dorsum of hand. With the help of fingers or blunt end of pencil little pressure was applied on the web-space between the fingers. Complete palm impression including the hollow of palm was obtained over the paper. The same procedure was followed for recording the palm prints of left hand. Thus palm prints of both hands were obtained and recorded [10].

After printing, subject’s hands were cleaned by using spirit, soap and water. Instruments were cleaned in the similar way.

Results

Since dermatoglyphic differences have been reported in males and females the observations were recorded and tabulated separately. All the parameters were compared and analyzed in a single group, since the ridges or patterns once formed remain the same throughout life. There is decrease in total value of arches in Male patients than Controls, Which is statistically Very highly significant. There is decrease in total value of ulnar loops in Male Patients than Controls, Which is statistically Very highly significant. There is slight decrease in total value of Radial loops in Male Patients than Controls, Which is statistically not significant. There is increase in total value of Whorls in Male Patients than Controls, Which is statistically Very highly significant.

Table 1: Comparison of fingertip patterns in Female Patients and Controls.

Patterns	Total Value (FP)	Total Value (FC)	Chi-square value	Statistical Significance
whorls	115	87	4.514	Significant
Radial Loops	4	6	0.4028	Not Significant
Ulnar Loops	158	159	0.0040	Not Significant
Arches	3	28	20.605	Very highly Significant

There is decrease in total of arches in Female patients than Controls, Which is statistically Very highly significant. There is slight decrease in total value of ulnar loops in Female patients than controls, which is statistically not significant. There is decrease in total value of radial loops in Female patients than controls, which is statistically not significant. There is increase in total value of Whorls in Female patients than controls, which is statistically significant. (Table 1)

Discussion

Dermatoglyphic features are confirmed by polygenic system with only additive contribution by individual genes [4]. Genetic theory says that the basic fingerprint pattern sequence present in all is ulnar loops and various genes cause deviations from this pattern sequence. Thus other patterns are formed [5].

The interface between two layers is dermo-epidermal junction, which shows complex opography, being marked by peg and socket or ridge and groove interdigitations between two [6-8]. So they are firmly holding each other. Each ridge of palm and sole has an underlying ridge of connective tissue known as the primary dermal ridge. Each primary ridge is divided into secundar dermal ridge by downward projection of epidermis called rete pegs because it appears like peg in sections. The epidermis presents surface markings like tension lines, flexion creases (skin joints) and papillary ridges. These papillary ridges show particular arrangements, which are classified as loops, whorls, arches etc.

Each ridge of palm and sole has an underlying ridge of connective tissue known as the primary dermal ridge. Each primary ridge is divided into secondary dermal ridge by downward projection of epidermis called rete pegs because it appears like peg in sections. The epidermis presents surface markings like tension lines, flexion creases (skin joints) and papillary ridges. These papillary ridges show particular arrangements, which are classified as loops, whorls, arches etc.

Fingertip patterns

Following are the fingertip patterns, which are statistically significant.

- 1) There is decrease in number of arches in Male patients as compared to Controls.
- 2) There is decrease in number of ulnar loops in Male patients as compared to Controls.
- 3) There is increase in number of Whorls in Male Patients as compared to controls.
- 4) There is increase in number of Whorls in female Patients as compared to controls.
- 5) There is decrease in number of arches in Female Patients as compared to controls.

Finger ridge count

- 1) There is increase in mean value of TFRC, AFRC in Male patients as compared to controls.
- 2) There is increase in mean value of TFRC, AFRC in Female patients as compared to controls.

‘ab’ ridge count

- 1) There is slight decrease in mean value of ‘ab’ ridge count in right hands of male patients than male controls.

Palmar patterns

Following are the palmar patterns, which are statistically significant.

‘atd’ angle: - There is decrease in mean value of ‘atd’ angle in right hands of male patients as compared to male controls. There is decrease in mean value of ‘atd’ angle in left hands of male patients as compared to male controls. There is decrease in mean value of ‘atd’ angle in right hands of female patients as compared to female controls. There is decrease in mean value of ‘atd’ angle in left hands of female patients as compared to female controls.

Triradii

There is decrease in number of male patients having ‘7’ triradii in their left hands as compared to male controls.

I1-I5 patterns

There is decrease in number of female patients having I3 pattern in their left hands as compared to female controls.

Conclusion

Dermatoglyphic patterns are genetically transmitted and Genetic contribution is one of the causes of pulmonary tuberculosis. So the study was undertaken. Many dermatoglyphic patterns seen in pulmonary tuberculosis patients are found to be statistically significant in comparison with controls. Further study of large number of sample is required to know the significance of findings which are of importance and study with patient's relatives is required to know whether dermatoglyphics can be used as a screening or investigative procedure for persons with respiratory ailments.

Conflict of Interest: No conflict of interest

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References

1. Cummins H, Midlow C. Palmar and plantar epidermal configuration in European Americans. *Am. J Phy. Anthropol.* 1926; (9):471.
2. Ashley Montague MF. Finger, palm, toe and soles prints. An introduction of physical anthropology. 3rd ed. springerfield, Charles C. Thomas publisher, 1960, 581-582.
3. Hooton EA. Up from Ape. 2nd ed, New York, The McMillan Company, 1960.
4. Blanka S, Alter M. Dermatoglyphics in Medical disorders. Library of congress: Springer, Verlag. New York: Heidelberg, Berlin, 1976.
5. Sylvius. Groshan Fabiola, Ezine articles, (Online) available at: http://EzineArticles.com/?expert=Groshan_Fabiola, updated on 2007/25 March, (accessed: 5 Aug 2010).
6. Manget. Groshan Fabiola, Ezine articles, (Online) Available at: http://EzineArticles.com/?expert=Groshan_Fabiola updated on 2007/25 March, (accessed: 5 Aug 2010).
7. Marten B. Groshan Fabiola, Ezine articles, (Online) Available at: http://EzineArticles.com/?expert=Groshan_Fabiola updated on 2007/25 March, (accessed: 5 Aug 2010).
8. Koch R. "Robert Koch and Tuberculosis: Koch's Famous Lecture". Nobel Foundation. 2008, (Online) Available at: http://nobelprize.org/educational_games/medicine/tuberculosis/readmore.html Retrieved 2008-11-18 (accesed: 5 Aug 2010).
9. Waksman SA. "The chemical nature of actinomycin, an

- antimicrobial substance produced by actinomyces antibiotics". *J. Biological chemistry* 1940, 142: 519-528.
10. Kumar V, Abbas A, Fausto N, Aster Robb J.