IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 14, Issue 4 Ver. V (Apr. 2015), PP 69-72
www.iosrjournals.org

Dermatoglyphic Patterns and Aggressive Periodontal Diseases – A Possible Link?

Dr Devishree G[1], Dr. Sheela Kumar Gujjari[2]
1- Lecturer, Department of Periodontology, J.S.S. Dental College & Hospital, S.S.Nagar, Mysore, India
2- Professor and HOD Department of Periodontics, J.S.S. Dental College & Hospital, S.S.Nagar, Mysore, India

Abstract:
Background: *Role of host genes in the etiopathogenesis of periodontal diseases have been useful in developing screening tools for identifying patients who are likely to develop disease. With the risk for aggressive periodontal disease being substantially heritable, search for new screening tools are in the forefront. Dermatoglyphics being one such diagnostic tool has been an area of research. Although periodontal diseases have multifactorial etiology, their genetic determinants that exist could be suggestive of specific dermatoglyphic patterns for aggressive periodontitis. Hence the present study attempted to find any specific dermatoglyphic patterns in aggressive periodontitis.*
Objectives: *The present study aimed to compare the palmar dermatoglyphic features in aggressive periodontitis patients and periodontally healthy individuals.*
Material and Methods: *The finger-tip prints of 15 patients with aggressive Periodontitis and 15 periodontally healthy subjects were obtained. The finger tip patterns were analysed with the help of Automated Finger print Identification System (AFIS). The obtained data were subjected to statistical analysis.*
Results: *Within the limitations of the present study however, an increased frequency of ulnar loops were found on all fingers of patients with aggressive periodontitis.*

I. Introduction

Dermatoglyphics is a relatively new science, involving the study of fine patterned dermal ridges on digits, palms and soles. Dermatoglyphics are the dermal ridge configuration on the digits, palms and soles. Dermal ridge patterns are fully formed 16 weeks after conception and do not change during the rest of life. They are genetically determined and influenced by environmental forces that are operating before birth. Since epidermal ridge patterns form early in fetal development and remain unchanged throughout life [1,2], unusual dermatoglyphics may indicate gene or chromosomal abnormalities consistent with diseases.

The ridge patterns on the distal phalanges of the fingertips are divided into the three groups: arches, loops and whorls.[1] Arch is formed by a succession of more or less parallel ridges, which traverse the pattern area and form a curve that is concave proximally. The arch pattern is subdivided into two types. The simple (or plain) arch (A) is composed of ridges that cross the fingertip from one side to the other without recurring. If, however, the ridges meet at a point so that their smooth sweep is interrupted, a tented arch (T or A^t) is formed (Fig 1).

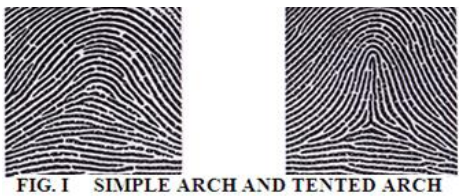

FIG. I SIMPLE ARCH AND TENTED ARCH

The point of confluence is called a triradius because ridges usually radiate from this point in three different directions. The most common pattern on the fingertip is a loop (Fig II). In this configuration, a series of ridges enters the pattern area on the same side. If the ridge opens on the ulnar side the resulting loop is termed an ulnar loop (U, L^U), whereas if it opens toward the radial margin it is called a radial loop (R, L^r).

FIG. II LOOP

A whorl (W) Fig III) is any ridge configuration with two or more triradii. One triradius is on the radial and the other on the ulnar side of the pattern.

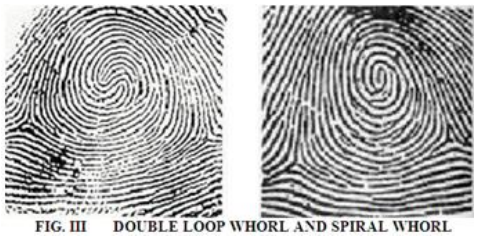

FIG. III DOUBLE LOOP WHORL AND SPIRAL WHORL

II. Methodology

Patients for the study were selected from regular outpatient department of Periodontology, JSS Dental College and hospital, Mysore. The study was approved from the ethical committee of the institution. The participants were explained about the study and then included with an informed consent.

The control group consisted of 15 periodontally healthy subjects. The Test group consisted of 15 subjects diagnosed clinically with aggressive Periodontitis

The finger prints of case and control subjects were obtained using black ink strips on a prepared format

The finger tip patterns were analysed with the help of Automated Finger print Identification System (AFIS). Results: The obtained data were subjected to statistical analysis. For qualitative analysis Chi Square test was used (Table 1).

	Cases		Controls	
	No.	**%**	**No.**	**%**
Whorls	45	30	54	36
Ulnar Loop	85	57	60	40
Radial Loop	12	8	5	3
Arch	6	4	3	2
Tented Arch	2	1	0	0

Table 1 – Distribution of dermatoglyphic pattern in cases and controls

III. Discussion

The term dermatoglyphics (skin casings) was coined in 1926 (Cummins and Midlo) to describe what until then had been referred to as epidermal ridge configurations.[3]

Over the last thirty years or so, more than four thousand papers have been published on the significance of skin-ridge patterns. Whilst many of these have been restricted to the study of genetic or congenital disorders, not all of them have been related solely with chromosomal disorders. Significant investigations have also been carried out into the dermatoglyphic indicators of congenital heart disease, leukemia, cancer, coeliac disease, intestinal disorders, rubella embryopathy, Alzheimer's disease, schizophrenia as well as other forms of mental illness.[4] The current state of medical dermatoglyphics is such that the diagnosis of some illnesses can now be done on the basis of dermatoglyphic analysis alone and currently, several dermatoglyphic researchers claim a very high degree of accuracy in their prognostic ability from the hand's features.[4]

Studies on inheritance of dermatoglyphics by qualitative and quantitative methods have shown great resemblance among monozygotic twins and reasonably strong inheritance among siblings and parents. Because of the great diversity in the types and combinations of patterns found on the fingers, palms and soles, it is evident that the formation of the dermal ridges would be determined by many genes spread over many chromosomes.[5] Yilmas S et al performed a study on 36 Early onset periodontitis and 20 adult periodontitis patients and 20 periodontally healthy individuals. The study elaborated dermatoglyphics, which is a genetic test method, suggesting the modes of inheritances of hereditary diseases. The diagnostic value of this genetic test method, which is the study of the quantitative and qualitative characteristics of patterns of ridged skin, and the role of heredity on periodontal diseases were discussed. [6]

Atasu M et al in 2005 compared the finger-tip patterns of the juvenile Periodontitis (JP) patients with those of periodontally healthy individuals. They reported decreased frequencies of twinned and transversal ulnar

loops on all fingers of the patients with juvenile Periodontitis, a decreased frequency of double loops on all fingers and an increased frequency of radial loops on the right second digits of the patients with Rapidly progressing Periodontitis (RPP), and the increased frequencies of concentric whorls and transversal ulnar loops on all fingers of the patients with Adult periodontitis, an increased frequency of t″ triradii on the palms of the patients with JP, the increased frequencies of IV and H loops and tb triradii on the palms of the patients with RPP and an increased frequency of e triradii on the soles of the patients with JP. [7]

The present study was conducted on 15 aggressive Periodontitis and 15 periodontally healthy individuals. The finger tip patterns were assessed using Automated Finger print Identification System (AFIS), a unique and highly sensitive system. The assessment revealed an increased frequency of ulnar loops and decreased frequency of whorls on all fingers of patients with aggressive Periodontitis. This disparity in results with previous study could be attributed to the small sample size of the study population.

IV. Conclusion

Within the limitations of the study, it was found that certain finger tip patterns were in greater frequency in aggressive periodontitis patients. However, further studies with larger sample size are required to arrive at a conclusive report linking dermatoglyphic patterns in aggressive periodontitis.

References

[1]. Galton F. Finger prints. London: McMillan; 1982.
[2]. Henry ER. Classification and uses of finger prints. 8th Ed. London: H. M. Stationary Office; 1937.
[3]. Mavalwala J. Harold. Cummins and the birth, growth and development of dermatoglyphics. Am. J. Phys. Anthrop. 1975; 42: 177-82.
[4]. The development of the study of dermatoglyphics. http://www.johnyfinham.com/history/dermatoglyphics.htm.
[5]. Uchida IA, Soltan HC. Evaluation of dermatoglyphics in medical genetics. Pediatric Clinics of North America 1963; 10: 409-21.
[6]. Yilmaz S, Atasu M, Kuru B. A genetic and dermatoglyphic study on periodontitis. J Marmara Univ Dent Fac. 1993 Sep;1(4):297-306.
[7]. Atasu M, Kuru B et al. Dermatoglyphic findings in periodontal diseases. International Journal of Anthropology January, 2005;Volume 20, Numbers 1-2:63-75.

Legends for figures

Figure 1 - Black ink strips used for taking finger prints
Figure 2 - Finger tips rolled on ink strips
Figure 3 - Finger tip prints recorded on prepared format
Figure 4 - Individual patient finger print analysed with Automated Finger print Identification System (AFIS).

Figure 1

Figure 2

Figure 3

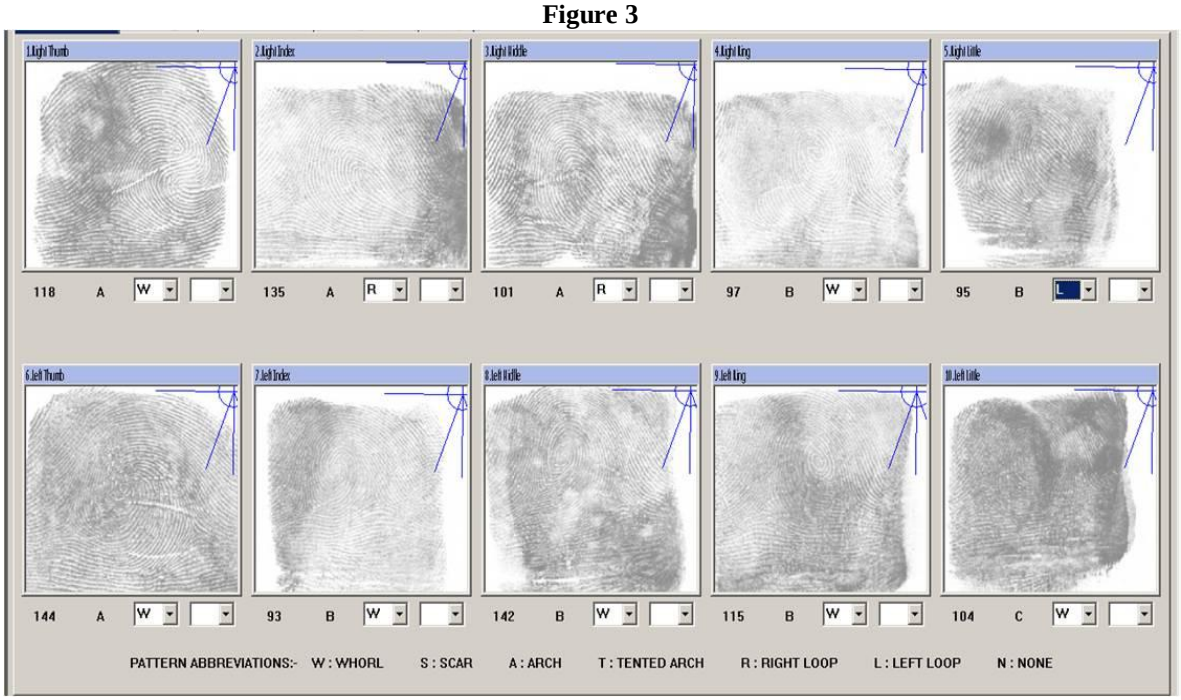

Figure 4