

A Dermatoglyphic Study in Chronic Periodontitis Patients: A Cross-Sectional Study

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Abstract

Introduction: Dermatoglyphics refers to the branch of science which studies the pattern of skin (dermal) ridges present on fingers, toes and soles of human.

Aim & Objective

1. To determine the fingerprint patterns in patients with chronic periodontitis patients and in healthy controls without periodontitis.
2. To observe and compare the variations of fingerprints in both these groups.

Materials and Method: A study was conducted in the department of Periodontics, Institute of Dental Sciences, Bareilly where in 34 subjects were divided into two groups: Group I (control group) consisted of 17 patients without periodontitis and Group II consisted of 17 patients with chronic periodontitis. Fingerprints were taken using biometric digital scanner.

Results: Among the finger ridge patterns, whorl pattern was found to be the most common in group II compared to group I.

Conclusion: There can be a significant correlation between the dermatoglyphic pattern and periodontitis.

Introduction

Dermatoglyphics refers to the branch of science which studies the pattern of skin (dermal) ridges present on fingers, toes and soles of human. Term coined by Dr. Harold Cummins in 1926, who was regarded as “Father of Dermatoglyphics”.^{1,2}

Once formed, ridge patterns remain unchanged for life and no two individuals share the same patterns. It helps in personal identification, crime detection, identification of dead person in mass disaster, accidental exchange of new born babies and prediction of some medical and genetic disorders.^{3,4,5}

In dentistry, it has been studied to predict disorders such as OSMF, dental caries, malocclusion, and periodontitis. Since the recent diagnostic methods used to determine the genetic basis of periodontitis are expensive and technosensitive, dermatoglyphics has been used to alleviate this predicament.^{6,7,8}

Aim and Objectives

- To determine the fingerprint patterns in patients with chronic periodontitis and in healthy controls without periodontitis.
- To observe and compare the variations of fingerprints in both these groups.

Materials and Methods

A cross-sectional study was conducted on 34 subjects who were divided into two groups. Group I consisted of 17 healthy controls without periodontitis. Group II consisted of 17 patients with chronic periodontitis.

Inclusion Criteria

Cooperative patients who gave voluntary informed consent and diagnosed clinically and radiographically with chronic periodontitis having Russell’s Periodontal Score (RPS) more than 4 (i.e. Score 6 and 8).

Exclusion Criteria

- ✓ Uncooperative patients.
- ✓ Medically compromised patients.
- ✓ Patients having Russell’s Periodontal score less than 6.



Fingerprints were taken using biometric digital scanner. The data was compiled by using SPSS version 26.0. Statistical analysis was done by using chi-square test and t-test. $p < 0.05$ was considered to be statistically significant. Finger ridge patterns were categorized as per the criteria of Sir Richard Henry (1897)⁹ into three forms as:

- ✓ Loop
- ✓ Arch
- ✓ Whorl

• Finger Ridge Pattern: Loop



Ulnar Loop



Radial Loop

Finger Ridge Pattern: Arch



Plain Arch



Tented Arch

Finger Ridge Pattern: Whorl



Central Pocket Whorl

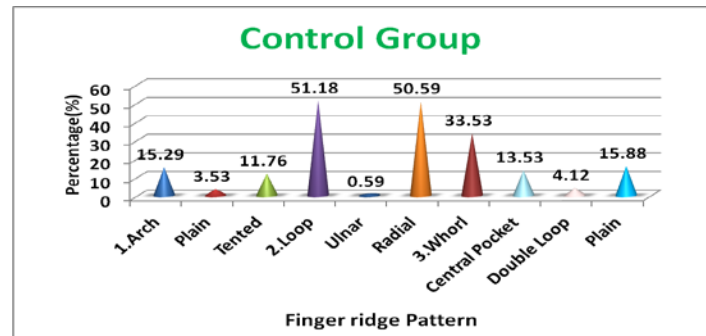


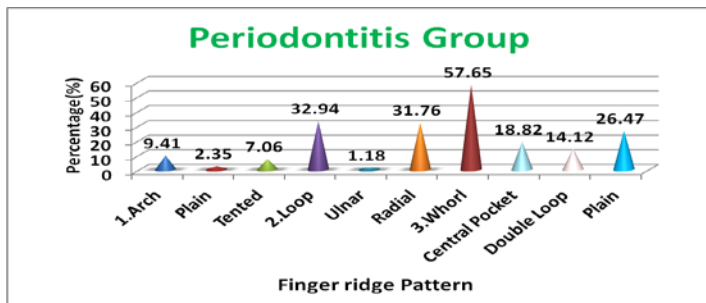
Double Loop Whorl



Plain Whorl

Results





Finger ridge Pattern	Control		Periodontitis		P-Value (Significance)
	No	%	No	%	
1.Arch	26	15.29	16	9.41	0.165(NS)
Plain	6	3.53	4	2.35	0.751(NS)
Tented	20	11.76	12	7.06	0.214(NS)
2.Loop	87	51.18	56	32.94	0.012(S)*
Ulnar	1	0.59	2	1.18	1.00(NS)
Radial	86	50.59	54	31.76	0.008(HS)
3.Whorl	57	33.53	98	57.65	0.001(HS)*
Central Pocket	23	13.53	32	18.82	0.281(NS)
Double Loop	7	4.12	24	14.12	0.004(HS)
Plain	27	15.88	45	26.47	0.045(S)

*NS-not significant, S-significant, HS-highly significant.

In the group I (control group), loop pattern found to be highest followed by whorl pattern and arch pattern. (Table 1, Graph 1)

While in the group II (periodontitis group), whorl pattern found to be highest followed by lop pattern and arch pattern. (Table 1, Graph 2)

Discussion

Dermatoglyphics have proven its evidence in the field of anthropology, medicine, statistics and genetics. It is a non-invasive method without any trauma to the patient. Data collected can be preserved for longer duration for future references.

In the present study, the most frequent finger ridge pattern among periodontitis subjects was whorl pattern followed by loop pattern and the least was arch pattern. Among the whorl patterns, plain whorl was the predominant one.

This result was similar to the studies done by Reddy H, et al (2017)¹, Elavarasu S, et al (2017)⁷, Atasu M, et al

(2005)¹⁰ and Astekar S, et al (2017)¹¹, who found decrease frequency of loop pattern, with a proportional increase in the whorl pattern among periodontitis patients as compared to controls.

This result was dissimilar to the studies done by Vaidya Prutha, et al (2017)¹² and Kochhar GK, et al (2014)¹³ who found no significant whorl relation among periodontally compromised patients.

Conclusion

Certain finger ridge patterns (whorls) were in greater frequency in chronic periodontitis patients, so it can be serve as predictor in identifying the risk group individuals of chronic periodontitis.

Studies with larger sample size is needed to associate the dermatoglyphic patterns in chronic periodontitis.

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