Original Research Paper

Oral Medicine

CORELATION BETWEEN PALMAR DERMATOGLYPHICS OF ORAL SQUAMOUS CELL CARCINOMA PATIENTS AND NORMAL PATIENT. A QUALITATIVE AND QUANTITATIVE STUDY.

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ABSTRACT

Background and Objective: Several studies have shown association between dermatoglyphics and different types of cancer. Dermatoglyphics are the dermal ridge configuration on the digits, palms and soles. They are genetically determined and influenced by environmental forces that are operating before birth.. Hence this study was undertaken to determine whether specific dermatoglyphic patterns exists which help in predicting the occurrence of oral squamous cell carcinoma (OSCC).

Materials and Methods: Finger and palm prints were collected using Ink method from 30 subjects with OSCC, and 30 healthy controls and were evaluated qualitatively and quantitatively. Results: Arches and loops were more frequent in cases than in controls whereas whorls were more frequent in control group (P< 0.01). Conclusion: Our study concluded that dermatoglyphic patterns may have a role in identifying individuals either with or at risk for developing oral leukoplakia and OSCC. Hence can be used to identify high risk group, so that early primary and secondary preventive measures can be instituted in order to prevent the occurrence of these lesions.

KEYWORDS :

INTRODUCTION

Dermatoglyphics is not a new science and was established by Galton in the year 1892. It was Cummins and Midlo who coined the term "Dermatoglyphics" in 1926. Since decades the patterns of hand have enthralled individuals from intellectuals to laymen. These patterns of the hand are no longer restricted to palmistry. Through constant effort by eminent researchers these patterns now play an important role in the diagnosis of several medical and genetic disorders, which is a branch of genetics dealing with the skin ridge system[1] Epidemiological and experimental evidence indicates a causal relationship between tobacco (smoking and nonsmoking) and oral leukoplakia and oral squamous cell carcinoma (OSCC).[2] However, only a fraction of people exposed to tobacco develop oral leukoplakia and OSCC. Genetically determined differences among these individuals would explain the susceptibility.[3]

Since epidermal ridge patterns form early in fetal development and remain unchanged throughout life[3,4] unusual dermatoglyphics may indicate gene or chromosomal abnormalities consistent with diseases such as oral leukoplakia and OSCC. This study was undertaken to study dermatoglyphic patterns in individuals with OSCC, so that individuals with habits and similar patterns can be identified at the earliest and preventive measures can be instituted in these susceptible individuals to prevent the occurrence of oral leukoplakia and OSCC.

MATERIALS AND METHODS

Patients for the study were selected from regular out patient departments of Oral Medicine who were referred to dep of conservative for needfull treatment.

Study consisted of 2 groups. 30 patients were included in each group.

Group I – 30 patients with OSCC.
Group II – 30 healthy individuals with habits but no lesions as control group.

Method of collection of data:

After explaining about the study to the subjects, an informed consent was obtained. A detailed history with thorough clinical examination was done and findings were recorded in a specially prepared case history proforma. The clinically diagnosed cases of oral leukoplakia and OSCC were confirmed histopathologically and included in the study.

Materials used for obtaining palm and þngerprints:
- BLUE Duplicating Ink (Kores, Bombay).
- Good quality paper.
- Soap, water, towel.

Procedure for obtaining prints:

To enhance the quality of dermatoglyphic prints, it is necessary to remove sweat, oil and dirt from the skin. This was accomplished by washing the ridged areas with soap and water followed by drying.

Then ink was uniformly spread over the palm and fingers. Prints of fingertip were taken first followed by that of the palm, on the paper kept over the table. Once the satisfactory prints were obtained of the fingers and palms, the patient was instructed to wash his hands with soap and water. Then the finger and palm prints were analyzed qualitatively and quantitatively using following materials and were recorded in a specially prepared format (Annexure I):

1. Magnifying lens.
2. Ruler.
3. Pencil.
4. Sharp/pointed instrument.

Qualitative Analysis

Fingertip patterns and palmar patterns were studied under qualitative analysis.
Fingertip patterns could be:
1. Arches (A)
2. Loops (L)
3. Whorls (W)

Palmar patterns were studied as:

1. Hypothenar area.
2. Thenar/First interdigital area.
3. I2, I3 and I4 interdigital area.

Quantitative Analysis

Quantitative analysis was done under the following headings.

1. AB ridge count,
2. Finger ridge count
3. Total finger ridge count (TFRC).
4. ATD angle.

RESULTS

Table 1 shows distribution of various finger print patterns in patients with OSSC. Among them 07.00% have arches, 60.70% have loops and 32.30% have whorls .

Table 1: Fingerprint pattern in patients with oral squamous cell carcinoma

Pattern	OSCC (n=30)	Percentage
Arches	22	07.00
Loops	182	60.70
Whorls	98	32.30

Table 2: Fingerprint pattern in control group

Pattern	Control (n=30)	Percentage
Arches	6	02.00
Loops	90	30.00
Whorls	204	68.00

In patients with OSCC, there is an increased frequency of arches and loops whereas in control group there is an increased frequency of whorls. P value is 0.000, which is statistically quite significant. The most commonly observed hypothenar pattern is arch ulnar, which is equally distributed in all the three groups and is statisttically insignificant (P > 0.05) [Table 3].

Table 3: Frequency of thenar / I1 pattern in the study groups

	OSCC (n=30)	Control group (n=30)	P
Right	28 (90.00)	24 (83.30)	0.64
Left	24 (80.00)	22 (73.30)	

DISCUSSION

Dr. Harold Cummins in 1936 examined several children with trisomy 21 (Down's syndrome) and found consistent dermatoglyphic changes that were absent among controls. This earth-shattering discovery helped to move the budding science of dermatoglyphics from a place of obscurity to being acceptable as a diagnostic tool among medical personnel. Since then widespread interest in epidermal ridges developed in medical field since it became apparent that many patients with chromosomal aberrations had unusual ridge formations. Inspection of skin ridges, therefore seemed promising, simple, inexpensive means for determining whether a given patient had a particular chromosomal defect.[5]

With an ever-growing population, it becomes imperative that methods be developed to identify individuals either at risk or already having a given illness in the most costefficient manner without sacrificing quality of care. While such an imperative is not a new concept, the use of dermatoglyphics is rather a unique approach at low cost for identifying such individuals. In examining dermatoglyphics and cancer patients in general, one of the studies has noted an increase in whorls and a decrease in radial loops in 201 Turkish cancer patients.[6] Another study with different cancers found more whorls to be present and in studying high risk kindred also found more whorls.[7] In the other study, a decreased ridge count in patients with cancer was found.[8] Yet another study found an increased proportion of ulnar loops in cancer patients.[9] and alcohol are established risk factors for oral

leukoplakia and OSCC, substantial evidence also suggest that the carcinogenic process is driven by the interaction between exposure to exogenous carcinogens and inherent genetic susceptibility. In response to environmental exposures, genetic damage accumulates more quickly in individuals with genetic susceptibility to DNA damage than in those without such instability but with a similar exposure. Consequently, individuals with genetic instability might be at a greater risk for developing these lesions.[2,10] It is suggested that many genes which take part in the control of finger and palmar dermatoglyphic development can also give indication to the development of premalignancy and malignancy,[8] hence identifying persons at high risk for oral leukoplakia and OSCC could

be of great value to decrease the incidence of the same. Considering the high mortality and high morbidity rate due to oral cancer in India, we planned to assess palmar dermatoglyphics in oral leukoplakia and OSCC and find whether a correlation exists between oral leukoplakia,

OSCC and palmar dermatoglyphics Our study revealed differences in the dermatoglyphic patterns among various groups which could be considered genetic markers for detecting those who are predisposed to develop oral leukoplakia and OSCC. Hardly any dermatoglyphic study has been carried out in relation to oral malignancy, hence more studies with larger sample need to be undertaken to conclude the results.

CONCLUSION

The present study on palmar dermatoglyphics in oral leukoplakia and oral squamous cell carcinoma (OSCC) has few significant parameters which would help us to identify an individual with or at risk for developing oral leukoplakia and OSCC, so that high risk individuals can be identified and preventive measures can be instituted at the earliest to prevent the occurrence of oral leukoplakia and OSCC. This further proves that oral leukoplakia and OSCC are not just an environmentally acquired, but their roots are deep seated in the soil of genetics. Further research into the relation between oral leukoplakia, OSCC and genetics can give us more valuable clues which would probably help in preventing these diseases and free the mankind from these menacing diseases which are rampant everywhere, particularly now.

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