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A Palmar Dermatologlyphics study in head and neck cancer patients in western Rajasthan, India

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Abstract
Introduction: 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.
Aims and Objectives: The aim of this study was to determine the association between digital dermatoglyphics of the hands with cancerous and control groups.
Material and Methods: Present study was conducted at SNMC Jodhpur, Rajasthan. Finger and palmar prints were taken from patients suffering from head and neck cancer, undergoing treatment in M.D.M. Hospital, Jodhpur. The Students Studying in Dr.S. N. Medical, Jodhpur served as control.
Results and Conclusions: In the present study, we observed that the Main Line Index, the deviation of 't' does not show any significant difference between controls and cancer subjects.

Keywords: dermatoglypics, head & neck cancer, main line index

Introduction
Dermatoglyphics are dermal ridge configurations/pattern on digits, palm, and sole. Cummins in 1926 first introduced the term "dermatoglyphics" which refers to the study of the naturally occurring patterns of the surface of the hands and feet [1]. These patterns are fully formed 16 weeks after conception and do not changes till the rest of life. Widespread interest in epidermal ridge developed only in the last several decades when it became apparent that many patients with chromosomal aberration had unusual ridge formation. Unusual ridge configurations have been source to exist not only in patient with chromosomal defect but also in patient with precancerous and cancerous condition [2, 3]. The aim of this study was to determine the association between digital dermatoglyphics of the hands with cancerous and control groups. Dermatogyphics as a diagnostic aid is well established in a number of disease. Malignacies are considered as a important killer disease.

Material & Methods
Present study was conducted at SNMC Jodhpur, Rajasthan. Finger and palmar prints were taken from patients suffering from head and neck cancer, undergoing treatment in M.D.M. Hospital, Jodhpur. The Students Studying in Dr. S. N. Medical, Jodhpur served as control.
The hands were washed with soap and water, dried, humidity removed with ether. A Small dab of printers ink is put on inking slab & spread with the help of roller into a thin film. Palm is smeared uniformly with inked roller to cover the whole palm. A Paper is set on a round bottle and open fingers & Palm are successively rolled over with pressure on it permitting the bottle to roll forwards. Next separate impressions are taken of inked fingers by rolling the fingers (Cummins methods).
The prints were examined with a magnifying lens and observation made on:
1. a-b ridge cont., 2. b-c ridge count 3. c-d ridge count. 4. atd angle 5. Absence of triradii 6. Main line, Index 7. Simian line, Sydney line A triradius is a junction of three regions each containing a system of ridges which are approximately parallel. There are 4 triradii occurring at the base of each finger designated as a,b, c and d (except thumb) Another triradii is found at the base of palm between thenar and hypo thenar eminence called as triradii 't'. The tracings from radiants of a,b,c d and t triradii directed towards centre of the plam are called as main line of hand and are designated as A B C D & T lines. The atd angle is measured in both palm of each individual and sum of right and left atd angle is used. The main line index for each plam is the sum of values of ending of main line A & D.

Observation and Results
Observation and results were as follows

- The mean a-b ridge count of 75 cases of cancer right hands was 33.09 and left hand was 35.08, while that of control right hand was 33.9 and that of left hand was 34.2. The mean b-c ridge count of Cancers patients, right-hand was 21.3 and left hand was 22.78, while that of controls right hand was 22.5 and that of left hand was 23.1. The mean c-d ridge count of 75 cases cancer right hand was 28.18 and left hand was 29.2, while that of control right hand was 26.4 and that of left hand was 26.4. The mean ridge count of both hand combined in cancer a-b was 34.08, b-c was 22.04 and c-d was 28.72,while that of in control a-b was 34.1,b-c was 22.8 and c-d was 26.4. (Table No. 1)
- Average 'atd' angle in cancer was 38.2 º and in controls was 38.5º. In cancer right hand was 36.9º and left hand 39.5º while in control right hand was 38.1º and left hand was 38.9º (Table No. 2).

- Absence of triradii in control group 16 hands did not show presence of triradii. 2 subjects did not have 'b' triradii where as 'c' and 't' triadii were found absent in 13 and 1 cases respectively. in carcinoma patients triradii were found absent in one cases in 3 hands, 'c' in 7, 'd' in 4 and 't' in 6 cases (Table No.3).
- The average Main Line Index of Cancer Patients right hand was 8.56,left hand was 7.54 and combined was 10.7, while in controls right hand was 9.49, left hand was 9.01 and combined was 12.3 (Table No. 4).
- Simian line in control was present in 5 cases and in cancer subject present in 5 cases. Sydney line was present in 2 cases in controls and was not observed in any of cancer patients (Table No. 4).
- Deviation of't' In our study in control and cancer patients ulnar deviation (72% and 76.6%), central deviation (22% and 17.3%) and radial deviation (5.3% and 2%) respectively.

Discussion

Present study the mean a-b ridge count was not significant. Our results matched with the results of Ventruto *et al*. (1974) [9] obtained fingerprints and palmar configuration from 212 patients with different type of leukemia and compared with healthy subjects whereas our findings differed from Vormittage *et al*. (1986). The b-c-ridge count and c-d ridge count in our study were not significant.

The present study showed that there was no significant difference between the mean 'atd' angle of control and cancer subjects. The results observed in this study are similar to that of Rosen *et al*. (1968) who investigated dermatoglyphic pattern in 81. Caucasian and 44 Negro women with carcinoma of breast and compared with 138 Caucasian and 120 Negro control women; Ventruto *et al*. (1974) [9] observed 212 patients having leukemia. Polat *et al*. (1999) examined 28 patients (15 males, 13 females) with Wilms tumor and compared with 80 controls (42 males, 38 female) and observed that the mean 'atd' angle was significantly decreased in patients than controls.

In the present study, we observed that the Main Line Index does not show any significant difference between controls and cancer subjects, In our study we observed that the deviation of 't' does not show any significant difference as both in control and cancer. Subjects. In the present study the Simian line and Sydney lines does not show any significant difference. Simian line was noted in 5 cases both in control and cancer subjects. Our study matched with Rosen et at. (1968) analyzed finger and palm prints of 81 Caucasian and 44 Negro women with breast cancer compared with 138 Caucasian and 120 Negro controls.

Table 1: Comparison of a-b,b-c and c-d regions in Control and Cancer subjects

S.No.	Group studied	Number of hands	Palm ridge count (Mean ±SD)		
			a-b region	b-c region	c-d region
1	Control (75)	150	*34.1±7.1	**22.8±8.8	***26.4±11.7
2	Cancer	150	*34.08±6.5	**22.04±8.02	***28.72±11.2

Note: *P > 0.05, ** P> 0.05, *** P> 0.05

Table 2: Comparative study of 'atd' angle of Right and Left hands in Control and Cancer subjects ' atd' angle in Control and Cancer subjects

S. No	Group studied	atd angle (Mean ±SD)		P Value
		Right hand	Left hand	
1	Control	*38.1±9.2	**38.9±8.9	P > 0.05
2	Cancer	*36.9±14.9	**39.5±7.6	P > 0.05

*P > 0.05, **P > 0.05

Table 3: Showing Absence of triradii in both hands of control and Cancer subjects

Triradii	Control(75)			Cancer(75)		
	Right	Left	Total	Right	Left	Total
a	-	-	-	1	-	1
b	1	1	2	2	1	3
c	7	6	13	4	3	7
d	-	-	-	3	1	4
e	1	-	1	6	-	6

Table 4: Showing patterns of line in Right and Left hands and of Combined in both Control and Cancer subjects

Pattern of line	Control(75)			Cancer(75)		
	Right	Left	Total	Right	Left	Total
Simian line	2	3	5	3	2	5
Sydney line	-	2	2	-	-	-
Triradii	9.49	9.01	12.3	8.56	7.54	10.7

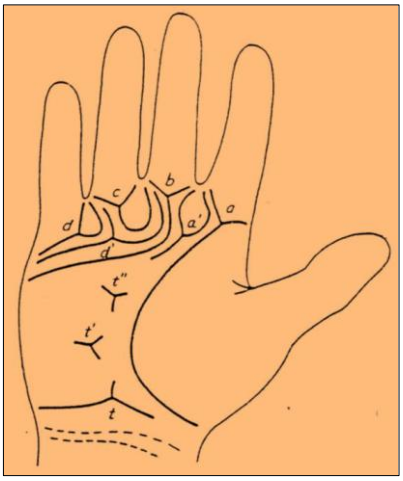

Fig 1: Palmer Triradii

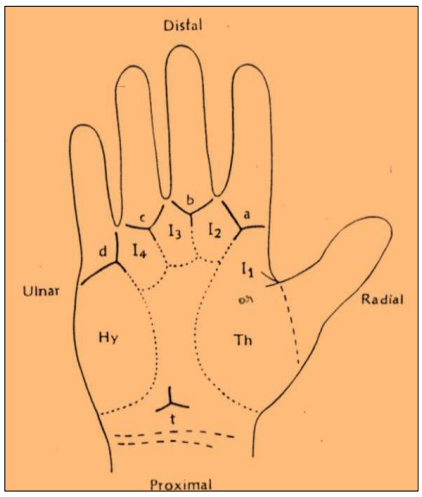

Fig 2: Palmar Dermatoglyphic Pattern Areas

Conclusions

There is a possible genetic influence on the digital ridge patterns in carcinoma of head and neck patients in whom the digital ridge patterns are otherwise non-significantly affected. The use of dermatoglyphics is rather a unique approach at low cost for identifying such individuals.

This relatively noninvasive anatomical technique could reasonably be used for screening head and neck cancer on selected non-symptomatic person as part of definitive risk assessment strategy and for guiding future research.

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