

# Dermatoglyphic Study in Breast Carcinoma Patients

D. Madhavi<sup>1</sup>, Sreelekha Dorairaj<sup>2</sup>, S. Swayam Jothi Dorairaj<sup>3</sup>, Hemanth Kommuru<sup>4</sup>

<sup>1</sup>Associate professor, A.C.S.R Government Medical College, Nellore

<sup>2</sup>Senior Resident, A.C.S.R Government Medical College, Nellore

<sup>3</sup>Professor and HOD, Shri Sathya Sai Medical College & Research Institute, Chennai

<sup>4</sup>Assistant professor, Shri Sathya Sai Medical College & Research Institute, Chennai

**Abstract:** This study was done to determine any variations in dermatoglyphic patterns among breast carcinoma patients against normal individuals, as it might, if found significant, can serve as a simple, early and a cost effective screening method for breast cancers. Finger print patterns of 100 histopathologically confirmed cases of female breast carcinoma patients and 100 normal female individuals of the same age group was studied. The parameters were analysed statistically. There was a significant increase in the occurrence of whorl patterns and in the total finger ridge count among the breast carcinoma patients.

**Keywords:** Dermatoglyphics, female, breast carcinoma, whorls, total finger ridge count

## 1. Introduction and Anatomy

Every individual's ridge configurations are unique. The dermal ridge differentiations are genetically determined and influenced by environmental factors. It has provided a simple, useful and inexpensive means of diagnostic value in several medical disorders for the last several decades.

### Aim

To correlate dermatoglyphics of histopathologically confirmed cases of carcinoma breast with a normal control group. This study has been undertaken with a curiosity to observe any significance in the dermatoglyphic patterns in Ca breast patients and to use the same in screening people at high risk for developing Ca breast.

### Materials:

Rolled finger and palmar prints of 100 female patients from Cancer institute, Nellore, between the age of 30 to 50 years with histopathologically proved breast carcinoma was taken as the study group. 100 teaching and non teaching female staff between the age group of 30 to 50 years were taken as the control group from ACSR Government Medical College, Nellore. Informed consent was taken from both the study and control groups.

The following were used to record the fingerprints:

- Printer's ink
- Good quality paper
- Cotton
- Spirit
- Magnifying lens
- Stamp pad

### Methods

Different methods of obtaining the dermal patterns are

- Standard ink method
- Inkless method
- Transparent adhesive tape method
- Photographic method
- Special methods

In this study we used the standard ink method and studied the following parameters

### Qualitative analysis

Finger print patterns (arches, whorls and loops)

### Quantitative analysis

- Total ridge count
- a-b ridge count (ridge count between triradi a and b)
- atd angle
- adt angle

## 2. Ridge Counting



Figure 1: Loops

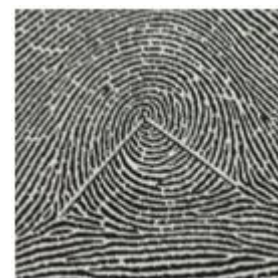


Figure 2: Spiral whorls



Figure 3: Double whorls



Figure 4: adt angle measurement



Figure 5: adt angle measurement

### 3. Observation

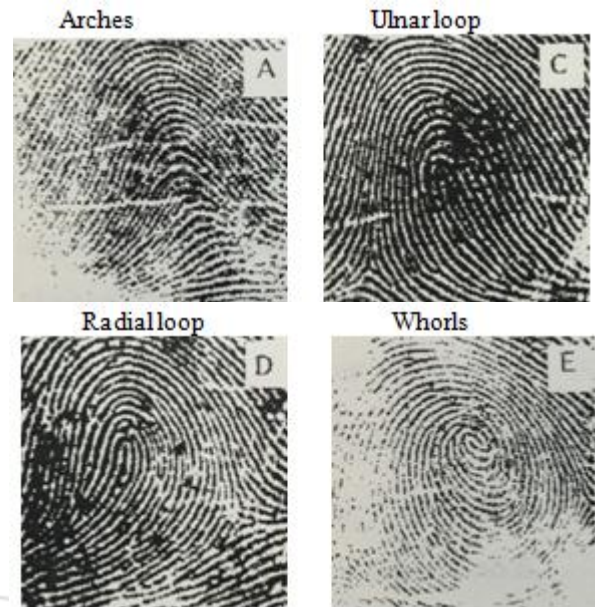
**Qualitative analysis:** of the pattern of finger prints was observed

In 100 breast carcinoma patients

Patterns	Right hand fingers(500)	Left hand fingers(500)
Arches	10.6%	8.6%
Whorls	53.2%	56%
Radial loops	1.8%	0.8%
Ulnar loops	34.4%	34.6%

In 100 controls

Patterns	Right hand fingers	Left hand fingers
Arches	6%	5.4%
Whorls	15.8%	16.2%
Radial loops	1.4%	1.4%
Ulnar loops	76.8%	77%



### 4. Quantitative Analysis

Total Finger Ridge Count:

	Mean	Standard deviation	Standard error
Breast carcinoma patients	83.84	12.36	1.34
Control group	56.87	5.40	

- a-b ridge count of right hand

	Mean	Standard deviation	Standard error
patients	30.55	2.15	0.26
controls	39.87	1.57	

- a-b ridge count of left hand

	Mean	Standard deviation	Standard error
patients	30.52	1.68	0.22
controls	39.66	1.64	

- adt angle of right hand

	Mean	Standard deviation	Standard error
patients	35.2	4.68	0.58
controls	41.23	3.57	

- adt angle of left hand

	Mean	Standard deviation	Standard error
patients	34.95	5.02	0.625
controls	41.2	3.74	

- adt angle of right hand

	Mean	Standard deviation	Standard error
patients	74	4.47	0.77
controls	72.95	6.28	

- adt angle of left hand

	Mean	Standard deviation	Standard error
patients	73.7	4.61	0.733
controls	72.7	5.71	

Statistical analysis using the Z-test gives the significance of the parameters

S. No	Parameters	P value	Significance
1.	TFRC	≤0.001	Highly significant
2.	a-b ridge count right hand	≤0.001	Highly significant
3.	a-b ridge count left hand	≤0.001	Highly significant
4.	atd angle right hand	≤0.005	Significant
5.	atd angle left hand	≤0.005	Significant
6.	adt angle right hand	≥0.50	Not significant
7.	adt angle left hand	≥0.50	Not significant

## 5. Discussion

The dermal patterns once formed remain constant throughout life. Dermatoglyphics is considered a window of congenital abnormalities and is a sensitive indicator of intra uterine anomalies [7].

### 5.1 Qualitative parameter

#### Finger print patterns:

In the present study, the whorl pattern showed a significant increase of 53.2% and 56% in right and left hands of patients respectively when compared with control group in whom the frequency of whorls were 15.8% and 16.2% of right and left hands respectively.

Ulnar loops showed a significant decrease in frequency of 34.4% and 34.6% in carcinoma patients as against 76.8% and 77% in controls of right and left hands respectively. Arches and radial loops did not show any significant difference against controls. Plato and Seltzer in 1982 studied finger print patterns in 119 caucasian females, and observed presence of 6 or more whorls in 32.4% of breast carcinoma patients as compared to in controls of 3.1% [1].

According to Huang C.M.et al radial loops were observed in excess. No significant difference was observed in total and absolute ridge count in breast carcinoma patients [3]. Floris G in 1990 concluded that whorls were significantly increased in breast carcinoma and showed a decrease in a-b ridge [4].

Seltzer in 1990, concluded in his study that the occurrence of more than 6 whorls was more frequent in breast carcinoma patients [5].

Sukree S.B in 2004 studied dermatoglyphics in 50 breast carcinoma patients and concluded that there was a significant increase in arches and whorls in carcinoma patients [6].

### 5.2 Quantitative parameters

#### 1. Total finger ridge count:

In the present study, Total finger ridge count was very significantly increased in patients as compared to controls. N.S.Sridevi et.al in 2010, studied 100 histopathologically confirmed breast carcinoma patients against 100 age matched controls and concluded that there was a significant increase in the total finger ridge count in patients as compared with the control group [2].

According to Huang C.M.et al radial loops were observed in excess. No significant difference was observed in total and absolute ridge count in breast carcinoma patients [3].

#### 2. a-b ridge count

In our study, the a-b ridge count showed a statistically highly significant decrease in breast carcinoma patients as compared with controls in both right and left hands.

Floris G in 1990 concluded that whorls were significantly increased in breast carcinoma and showed a decrease in a-b ridge [4].

Sukree S.B in 2004 studied dermatoglyphics in 50 breast carcinoma patients and concluded that there was no statistical variation in a-b ridge count in carcinoma patients [6].

#### 3. Atd angle

In the present study, the atd angle was significantly decreased as compared against the control group in both right and left hands. Sukree S.B in 2004 studied dermatoglyphics in 50 breast carcinoma patients and concluded that there was a significant increase in arches, whorls and atd angle in carcinoma patients [6].

#### 4. Adt angle

Our study showed no significant variation in adt angle among study and control groups. Sukree S.B in 2004 studied dermatoglyphics in 50 breast carcinoma patients and concluded that there was no significant difference in adt angle [6].

## 6. Conclusion

It has been proved earlier through extensive research that a direct correlation exists between the finger prints of a person and their medical and behavioural profile.

In this study we found that there was a significant increase in the whorl pattern in breast carcinoma patients. A significant increase in the total finger ridge count, a decrease in a-b ridge count and decrease in atd angle was noted in carcinoma breast patients. No significant difference in adt angle was seen.

The present study was undertaken to find any significant dermatoglyphic difference between controls and carcinoma breast patients, as study of dermatoglyphic patterns is an easy, cost effective and a non-invasive procedure and would serve as a tool, for early screening of breast carcinoma patients.

Further study of these parameters in a larger number of breast carcinoma patients with relation to tumours showing Estrogen receptor positivity, in relation to the intraductal and intralobular types of breast carcinomas and also in relation to the genes BRCA1 and BRCA2 can be done to understand the relevance in using dermatoglyphic study as a screening procedure.

## References

- [1] SELTZER MH; PLATO CC, et al. digital dermatoglyphics and breast cancer; breast cancer Res treat;1982;2(3);261-5.
- [2] N.S.SRIDEVI; C.R.WILMA DELPHINE SILVIA. Palmar dermatoglyphics in carcinoma breast of Indian women; Romanian Journal of Morphology and Embryology 2010,51(3):547-550.
- [3] HUANG CM; MiMP; Digital dermal patterns in breast cancer; Proc Natl Sci Conc Repub, China B; 11: 133-6.
- [4] G. FLORRIS; M.G.SANCIU and E.SANNA. Dermatoglyphics in pathology with emphasis on breast cancer and cervix carcinoma, International Journal of Anthropology, vol.5;2:1990;P.No:125-128.
- [5] SELTZER MH; PLATO CC; FOX KM. Dermatoglyphics in the identification of women either with or at risk for breast cancer; American Journal of Medical Genetics; 1990; vol.37(4); 482-488.
- [6] S.B.SUKREE, AA MAHAJAN. Dermatoglyphics in the identification of women either with or at risk for breast cancer; 51<sup>st</sup> journal of Anatomical society of India; vol.5, No.1; 2004-01; 2004-06.
- [7] SCHAUMANN B, ALTER M(eds), Dermatoglyphics in medical disorders, Springer-Heidelberg-New York, 1976,1-59.

