Original Research

Correlation of Dermatoglyphic variations and Breast cancer in Kashmir Population : A clinical study

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ABSTRACT

Background: Cancer screening is the main weapon for early detection at a pre invasive or premalignant stage. Dermatoglyphic traits are formed under genetic control similar to breast cancer sodermatoglyphics can represent a non invasive anatomical marker of breast cancer risk and thus help in early detection and treatment.Dermatoglyphics is the scientific study of epidermal ridges and their configuration on the volar aspect of the palmar and plantar regions . The ridge pattern depends upon cornified layer of epidermis as well as dermal papillae. Breast cancer is by far the most frequent cancer among women. The present study was conducted to correlate any relationship between palmar dermatoglyphics and breast cancer. **Material& Methods:** It comprised of 30 patients of breast cancer. A written consent was obtained regarding the study. Two groups were formed. Group 1 had 30 breast cancer patients and group 2 had 30 controls & the following parameters were analysed and measured: fingerprint pattern, total finger ridge count, palmar atdangle, tri-radial count& palmar a-b ridge count. **Results:** An increased pattern of whorls were seen in breast cancer patients. Mean atdangle in both groups was statistically significant(p<0.001) due to high angular range in cancer patients.Mean a-b ridge count in both groups was statistically significant (p<0.001) due to increased a-b ridge count in cancer patients. **Conclusion:** There were increased pattern of whorls, increased values of atd angle, increased tri-radial count, increased a-b ridge count &nonsignificant total finger ridge count in breast cancer patients.

Key words: Dermatoglyphic, Genetic, Fingerprint

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INTRODUCTION

Dermatoglyphics is the scientific study of epidermal ridges and their configuration on the volar aspect of the palmar and plantar regions (Cummins H &Midlo C, 1926).. The ridge pattern depends upon cornified layer of epidermis as well as dermal papillae. All epidermal ridges are usually laid down between tenth and eighteenth weeks of gestation. Once laid down they remain unchanged except for an increase in size parallel with general growth. Since genetic influence has been demonstrated in the formation of epidermal ridge patterns, studies have shown that a positive correlation exists between dermatglyphic patterns and some disease conditions, especially those with genetic basis. It is also used in forensic science for criminal identificationDermatoglyphics is considered as a window of congenital abnormalities and is a sensitive indicator of intrauterine anomalies. Breast cancer is by far the most frequent cancer among women. Breast cancer is the commonest neoplastic disease in women in the western world.

MATERIAL & METHOD

The present study was conducted in the department of Anatomy and Radiotherapy GMC Jammu. It comprised of 30 patients of breast cancer in group 1 and 30 controls in group 2. A written consent was taken from all the subjects. The subjects were asked to wash both hands with soap and water to remove dirt and grease. A small dab of ink was placed on the glass slab and spread with the roller to cover the whole area and the pattern was obtained on A4 paper. . The

rolled prints were taken by rotation of finger, both in inking and printing, in order to obtain complete impression of fingertip. The paper was laid, edges to edges, upon rigid plain surface of smooth table top or glass sheet. Inking was completed by placing the edge of the finger down on the ink film and rolled till the opposite margin comes in contact with surface of inking slab. This smeared the fingers from its end to a level just proximal to distal interphalangeal joint crease. Next the finger was pressed, edge down against paper margin and rolled to opposite edge in a manner similar to that in inking.

The thumb had to be placed with ulnar edge downward and rolled toward body and other digits were placed with radial edge downward rolled away from body. These prints were studied with the help of a magnifying lens for observation under different heads. The palmar prints were taken by applying ink with the help of the roller and the palm pressed against the paper placed on a hard surface. The qualitative parameters observed were: the types of patterns of individual digit or finger *i.e* loop, arch, whorl.

The quantitative parameters observed were: the ridge counts of individual fingers of both right and left hands, total finger ridge count, triradial count, a-b ridge count andatd angle.

For finger ridge counting, the basic dermatoglyphic landmarks were considered i.etriradius and core. A triradius is formed by confluence of three ridge systems and core is the approximate centre of the pattern.

A straight line was drawn connecting the triradius to the core and number of ridges was counted along the line using a sharp needle. For total finger ridge count, the sum of all ridge counts was taken. The *a-b* ridge count was calculated by counting the number of ridges intersecting a line drawn between the *a*triradius (at the base of the index finger) and *b*triradius (at the base of the middle finger) of the palm of each hand.The *atd*angle is the angle between two straight lines joining the triradius*a* and the triradius*d*, under the little finger, with a point *t*, on the lower outer portion of the palm. All the dermatoglyphic prints were studied, tabulated and analyzed by applying statistical data.

RESULT

Relationship of arches (p<0.001) and whorls (p<0.001) in Control group and Breast cancer group were statistically significant due to few number of arches and more number of whorls in cancer group. Relationship of mean total finger ridge count in Control group and Breast cancer group was statistically not significant (p=0.990). Relationship of mean atd angle in Control group and Breast cancer group was statistically significant (p<0.001) due to high angular range in breast cancer group. Relationship of mean tri-radial count in Control group and Breast cancer group was statistically significant (p<0.001) due to increased tri-radial count in Breast cancer group. Relationship of mean a-b ridge count in Control group and Breast cancer group was statistically significant (p<0.001) due to increased a-b ridge count in Breast cancer group.

Table 1: Relationship of dermatoglyphic patterns in Control group and Breast Cancer group in Kashmir region.

Pattern Typ	Control group (n=30)		BreastCancer group (n=30)		Statistical inference
	No.	%	No.	%	p value
Arches	3.5	11.66	0.4	1.33	< 0.001
Radial loops	4.1	13.66	4.1	13.66	0.905
Ulnar loops	14.6	48.66	11.7	39	0.058
Whorls	7.8	26	12.9	43	< 0.001
Cmposite	0	0	0.9	3	0.007
Total	30	100.00	30	100.00	100.00

Table 2: Comparison of TFRC in control and Breast cancer group

Parameter	Control group Mean±SD	BreastCancer group Mean± SD	Statistical inference
TFRC	117.80±9.48	117±28.77	p=0.990

Table 3: Comparison of atd angle in control and breast cancer group

ATD angle		Control group Mean±SD	Breast Cancer group Mean±SD	Statistical inference
	Right Hand	37.50±2.16	43.23±2.93	<0.001 Significant
	Left Hand	38.73±2.57	43.30±3.98	<0.001 Significant

Table 4: Comparison of tri-radial count in control and Breast cancer group

		Control group Mean$\pm SD$	Breast Cancer group Mean$\pm SD$	Statistical inference
Tri-radial count	Right Hand	11.03$\pm$1.92	11.8$\pm$1.42	p<0.001 significant
	Left Hand	10.83$\pm$2.03	12.37$\pm$1.42	p<0.001 significant

Table 5: Comparison of a-b ridge count in control and breast cancer group.

		Control group Mean$\pm SD$	BreastCancer group Mean$\pm SD$	Statistical inference
a-b ridge count	Right Hand	33.67$\pm$1.82	40.27$\pm$3.29	p<0.001 significant
	Left Hand	33.93$\pm$2.57	40.97$\pm$2.95	p<0.001 significant

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DISCUSSION

Abbasi S *et al.* (2006) in their study on dermatoglyphics of 616 women found that whorls were identified more frequently in women with breast cancer as compared to the control group.The present study is in accordance with the above study which also shows increased whorl pattern (43%) in breast cancer subjects. Sukre SB *et al* (2015) andLavanya J *etal* (2012) in their study found an increased whorl pattern in breast cancer patients than in control group. The present study also reported the same..Seltzer MH *et al* (1982) performed a study on 119 caucasian females and found the presence of six or more whorls is significantly associated with breast cancer. Our study is in consonance with the above study. The present study is in contrast with Raizada A *et al* (2013) who performed a study on 100 breast carcinoma patients and found an increase in arch pattern in cancer patients. Sukre SB *et al* (2015) conducted a study on 50 breast cancer patients and they found no relevance of total finger ridge count (TFRC) in breast cancer subjects and controls. The present study also found no statistically significant relevance of total finger ridge count (TFRC) in breast cancer patients. Fulari SP *et al* (2012) found that mean atd angle was higher in breast cancer patients as compared to controls. Our study is in agreement with the the above study which shows increased atd angle in breast cancer patients.Sukre SB *et al* (2015)&Natekar PE *et al* (2006)in their study found an increase in a-b ridge count in breast cancer subjects. Our study is in agreement with thesestudies which also shows an increase in a-b ridge count in breast cancer patients.Natekar PE *et al* (2006) and. Sridevi NS *et al* (2010) in their studies also found an increase in a-b ridge count in breast cancer subjects.Our study goes in accordance with these studies which also shows an increase in a-b ridge count in breast cancer patients.Lavanya J *et al* (2012) in their study on breast cancer patients found a decrease in a-b ridge count in breast cancer patients than in controls. The present study doesnot support the observation of Lavanya J *et al* (2010).Natekar PE *et al* (2006) in their study on 100 breast cancer subjects found an increased tri-radial count in breast cancer patients. Our study is in agreement with the above study in Kashmir region, which also shows an increased tri-radial count in breast cancer group.

CONCLUSION

There is predominance of whorls, increased atd angle, increased a-b ridge count, increased total finger bridge count in breast cancer patients

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