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TO CORRELATE THE ASSOCIATION OF THYROIDISM WITH CARCINOMA OF BREAST

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ABSTRACT

Introduction: There are number of diseases that can be associated with developing high risk of breast cancer; notably, among them are: thyroid disorder (thyroidism) and gallbladder stones (cholelithiasis). A number of breast cancer patients are found to have a history of thyroid problems and/or gallbladder stones indicating a possible role of these diseases in the development of breast cancer. The current research work utilizes the dermatoglyphic tool of ATD Measurement; *i.e.*, Angle of Triradius of palmer area by marking the palmer area with lipstick, or ink [pen] to demarcate epidermal ridges and measuring the angle by protractor. **Methods -ATD Angle Measurement-** ATD angle was measured and then a comparison was done between healthy females and the ones having breast cancer and thyroid problems. Mean ATD Angle Measurement was done in healthy control females, breast cancer females and Thyroid disorder patients. Five Breast Cancer female patients were selected from the hospital registry of JLNCH&RC at random and "atd" angles or axial triradius angles were measured in them along with five healthy control females and five females with thyroid disorders after taking their informed consent and other details such as Medical and Ob/Gyn History and making a Pedigree Chart. **Results:** The mean "atd" angle of breast cancer patients was found to be 40° and that of Thyroid disorder patients was found to be 39°. Healthy control females on the other hand had a mean atd angle of 36°. **Conclusion:** The several studies provides insight into the diseases like thyroid disorders and gallbladder stones that can pose high risk for developing breast cancer the mechanism of which is yet to be understood and more studies

needs to be done to explain the triggers caused by these diseases that leads to breast carcinogenesis and identification of woman at increased risk for the development of breast cancer. By utilizing this dermatoglyphic tool, the earliest possible diagnosis of breast cancer would be possible by establishing the diseases like thyroid disorders as high risk categories, which in turn would improve the results of breast cancer treatment.

KEYWORDS: Atd angle, Carcinoma Breast. Dermal ridges, Digital patterns, High Risk, triradii, total finger ridge count.

INTRODUCTIONS

In India, breast cancer is a very prevalent cancer in women and it has become very common in cities like Mumbai, Delhi, Bangalore, Bhopal, Kolkata, Chennai, Ahmadabad etc. Breast cancer is the most prevalent cancer for 25% to 32% of all female cancers in all these cities (PBCR 2019). Breast cancer has been rising progressively and what is more alarming is the fact that breast cancer seems to be more common in the younger age group in India since the last decade or two and the worst part is in young females it is generally found to be more aggressive.

There are number of diseases that can be associated with developing high risk of breast cancer; notably, among them are: thyroid disorder (thyroidism) and gallbladder stones (cholelithiasis). To find a link between these diseases and mechanism, a number of studies have been done in the last decade. The current research work aims to evaluate the possible association of thyroid disorders and gallbladder stones with carcinoma of breast. A number of breast cancer patients are found to have a history of thyroid problems and/or gallbladder stones indicating a possible role of these diseases in the development of breast cancer.

Emily K Brunson, Darrly J Hohnan *et al.*, (2015) did a study to explore the "ATD" angle as a dermatoglyphic trait formed by drawing lines between the triradii below the first and last digits and the most proximal triradius on the hypothenar region of the palm. This trait has been widely used in dermatoglyphic studies, but several researchers have questioned its utility, specifically whether or not it can be measured reliably. The purpose of this research was to examine the measurement reliability of this trait. Finger and palm prints were taken using the carbon paper and tape method from the right and left hands of 100 individuals. Each "ATD" angle was read twice, at different times, Alibha Rawat, and N. Ganesh *et al.*, (2017) did a study to explore **d**ermatoglyphics as a cost effective tool for sorting out women

at risk and thus decreasing the economic burden on screening mammography in a developing country like ours. Dermatoglyphic patterns of breast cancer patients observed in the present study are a basic data that can be useful for further studies. There is a possible genetic influence on the dermatologyphic patterns of breast cancer patients as found by the current study.

This is the most widely used method in Dermatoglyphics. The axial tri-radius is usually present in the proximal part of the palm in alignment to the fourth meta-carpel bone. The atd angle is formed by the lines drawn from the digital tri-radius ”a” to the axial tri-radius “t” and from this tri-radius to the digital tri-radius d. The more distal the position of t, the larger is the atd angle. Some palms especially those with the pattern on hypothenar region, may have more than one axial tri-radius. They are depicted as t’, t” t’” etc. The axial tri-radius separates the hypothenar area from thenar area.

The atd angle is an indicator of the degree of distal displacement of axial tri-radius. The angle increases as the radius is more distally located. The atd angle is even more sensitive to environmental factors than a-b ridge count. Wider atd angles have been reported in cases of Down Syndrome. Greater atd angle have been reported in cases of dyslexia (Cummins, 1960).

Increase in atd angle has been associated with arrested growth or an environmental insult during the gestation period. ATD angle reflects degree & speed of co-ordination between the nervous muscular system, reflecting one’s efficiency.

ATD angle measurement

For ATD angle measurement, entire palm was inked including wrist creases and hypothermal border. Sheet of paper was placed on a rubber pad on a flat stable surface.

The wrist of the person was placed on the bottom of the paper and then the rest of the palm was pressed on the paper. Now these palm prints were observed for ATD angle and measured.

MATERIAL AND METHODS

Anthropometric analysis was done by standard protocol of Cummins *et al.*, (1960) to measure atd angle. It is important to take a palm print for which method adopted was modified ink method by Purvis smith *et al.*, (1969). The patient and controls were asked to wash their hands with soap and water to remove grease and dirt and dried. Then ink was applied over the palm and fingers with a gauze piece and smeared thoroughly in light strokes. A sheet of paper was kept at the edge of the table. The finger ridges were printed starting from thumb to little finger in the same order. The finger tips were then rolled manually to take the full prints of the ridges, then the palm was rolled on cardboard roller with paper taking care that the cupped regions of the palm were printed properly. For atd angle, a line is drown from axial triradius 't' to the digital triradii 'a' and 'd' and the anglesin the triangle is measured using a protractor. This is called 'angle of 'triradius' or 'atd' angle.

Fig: 2

Fig: 3

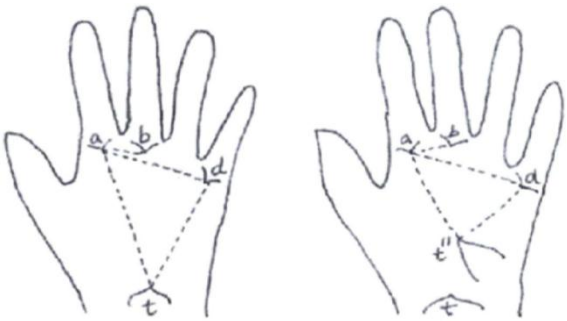


Fig: 4

Abbreviations : TFRC - Total finger ridge count; AFRC - Absolute finger ridge count ; (a-b) RC - ridge count at the intersect between point ‘a’- the base of the index finger to point ‘b’- the base of the middle finger; ‘atd’ angle - angle made by connecting the 'a', 't' and 'd' triradii points on the palm.

4. RESULT AND OBSERVATION

A. ATD Angle Measurement- ATD angle was measured on the selected subjects and then a comparison was done between healthy females and the ones having breast cancer and thyroid disorders. Mean and standard deviation was calculated and it was found that breast cancer females had wider ATD angles than both healthy control and thyroid disorder females. Thyroid disorder females in turn had wider angle than healthy females.

Mean ATD Angle Measurement in healthy control and breast cancer females

Table:-1 ATD Angles of Healthy Females.

SNO	Name	Age	ATD Angle	Average
1	BB	60	R-3O,L-35	32.5
2	UB	55	R-38,L-34	36
3	SM	45	R-40,L-35	37.5
4	SN	42	R-35,L-40	37.5
5	NI	37	R-37,L-35	36
				M=36°±0.86

The mean value and standard deviation of healthy control patients is = [36° ± 0.86]

Table:-2 ATD Angles of Breast Cancer Females.

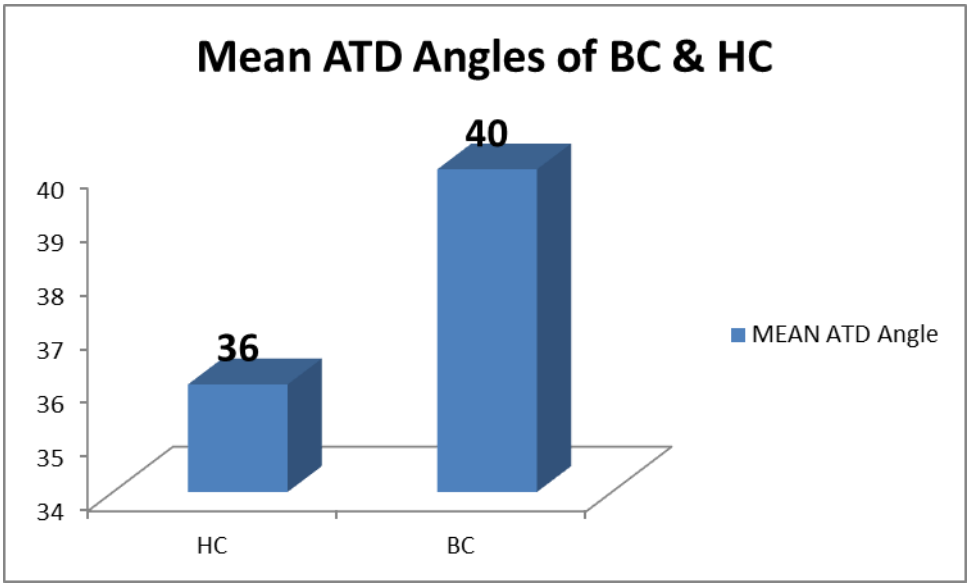
SN0	Name	Age	ATD Angle	Average
1	UK	66	R-41,L-41	41
2	KK	51	R-48,L-45	46.5
3	AG	46	R-40L-40	40
4	KP	48	R-45,L-40	42.5
5	SN	31	R-42,L-45	43.5
				M=40° ±2.68

The mean value and standard deviation of breast cancer patients is = [40°±2.68]

Mean ATD angles of healthy control females and Breast Cancer patients

Table:-3 Angles of HC and BC Females.

SNO	MEAN/SD
HC	36±0.86
BC	40±2.68



Graph showing mean ATD angles of Healthy and Breast Cancer females

The observations show that the females with breast cancer have more ATD angle than those with healthy ones. Graph of healthy control females and breast cancer females was plotted and compared for ATD angle.

THYROID DISORDER PATIENTS

Mean ATD Angle Measurement in healthy control and Thyroid disorder patients.

TABLE:-1 ATD Angles of Healthy Females.

SNO	Name	Age	ATD Angle	Average
1	BB	60	R-3O,L-35	32.5
2	UB	55	R-38,L-34	36
3	SM	45	R-40,L-35	37.5
4	SN	42	R-35,L-40	37.5
5	NI	37	R-37,L-35	36
				M±36°±0.86

The mean value and standard deviation of healthy control patients is = [36° ± 0.86]

Table:- 4 ATD Angles of Thyroid Disorder Patients.

SN0	Name	Age	ATD Angle	Average
1	SP	45	L=40,r =48	44
2	HT	40	L=40,R=45	42.5
3	SM	38	L=40,R=39	39.5
4	PJ	50	L=42,R =42	42
5	CB	38	L=45,R=45	45
				M=42.6°±2.1

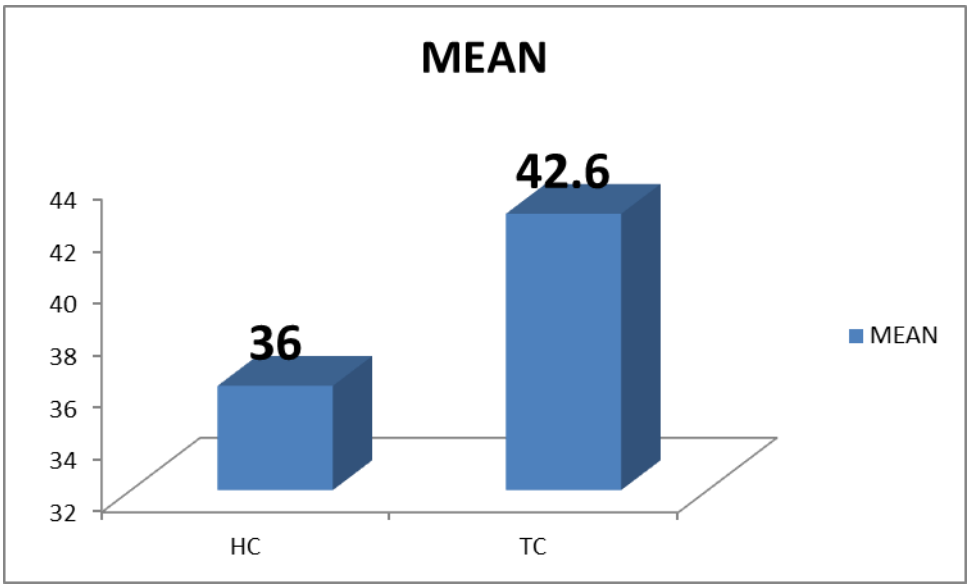
The mean value and standard deviation of thyroid disorder patients is = [42.6°±2.1]

Compare the healthy control patients and thyroid disorder patients

Table:-5 ATD angle of thyroid disorder patients.

SNO	MEAN/SD
HC	36°±0.86
TC	42.6°±2.1

Legends: HC: Healthy Control, TC: Thyroid disorder



Graph showing mean ATD angles of Healthy and thyroid disorder patients

Graph of healthy control patients and thyroid disorder patients was plotted and compared for ATD angle. The graph shows that thyroid disorder patients have wider ATD angle than healthy control females.

DISCUSSION AND CONCLUSION

The current research work is a preliminary basic data on dermatoglyphic tool of atd angle measurement to generate a marker for breast cancer screening in high risk groups like females with thyroid disorders. The wider atd angle of >40° can be indicative of hormonal imbalances that in the long run can pose risk for breast cancer in females. Further work needs to be done with large sample size and long-term follow-up studies to correlate the association between thyroid disorders and breast cancer. Diseases like gallbladder stones have also been associated with breast cancer risk and should be studied.

Several studies done in the past decade have provided insight into the association of diseases like thyroid disorders and gallbladder stones (Wysowski *et al.*, 1986) that can pose high risk for developing breast cancer the mechanism of which is yet to be understood and more

studies needs to be done to explain the triggers caused by these diseases that leads to breast carcinogenesis (Rawat Alibha *et al.*, 2017) and identification of woman at increased risk for the development of breast cancer, and thyroid cancer the earliest possible diagnosis of breast cancer would improve the results of breast cancer treatment. The mechanism of association between gallbladder stones and cancer is yet to be understood. The studies support the idea that aggressive measures should be taken to prevent breast cancer in individuals with these diseases by annual mammography screening and other health seeking behavior so that it can be caught early.

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