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Study of Dermatoglyphic Patterns in Breast Cancer Patients

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Conflicts of Interest: Nil

Abstract

Aim: Breast carcinoma is the most common carcinoma among Indian women after cervical carcinoma. It is a major threat to women today, with nearly half a million deaths due to a lack of early diagnosis. The present study is an attempt to study the role of Dermatoglyphics, which is the study of epidermal ridge configuration on palms, soles and finger tips, as a potential diagnostic screening technique for breast cancer.

Study Design: Hundred Breast Cancer patients were selected from Tertiary Care Hospital of MMIMSR Mullana Ambala at random and 'atd' angles or axial triradius angles were measured in them along with Hundred healthy control after taking their informed consent and other details such as Medical and Ob/Gyn History and making a Pedigree Chart. All the cases belonged to age group of 18-60 years.

Result: Dermatoglyphic patterns of breast cancer patients enrolled in the present study were found to be similar. The angles were found to be a little at the higher end >42º in case of breast cancer patients. The Dermatoglyphics of cancer patients were also compared with the healthy controls. The 'atd' angles of healthy controls were found to be mostly at the lower end, <42º as compared to the breast cancer patients. The mean 'atd' angle of breast cancer patient was found to be 48º and that of Healthy Control was found to be 39º as shown in Table 1.

Conclusion: On the basis of this report, we can conclude that Dermatoglyphics has the potential to help in the identification of woman at increased risk for the development of breast cancer, and the earliest possible diagnosis of breast cancer would improve the results of breast cancer treatment. Long term studies and large sample size is required to come to a firm conclusion.

Keywords: Dermatoglyphic, Breast Carcinoma, Diagnostic Tools

Introduction

Breast cancer is one of the most prevalent cancers in women and accounts for nearly 23% of all cancers worldwide. It is common between the ages of 35-54. Only 5-10% occurs in women with a clearly defined genetic predisposition. The presentation includes a lump in the breast or clear fluid discharge from nipple and skin changes. Factors disposing to carcinoma breast are genetic predisposition, hormonal factors, nulliparous, murine mammary tumour virus, ionizing radiation, immunologic incompetence and personal demographic factors [1-2]. It has been increasing at an alarming speed and there is a need for searching for new and better diagnostic tools for its early and effective diagnosis. The current diagnostic tools include mammography, ultrasonography, and FNAC. Mammography has also resulted in a lot of false negative cases and the anxiety resulted due to this understandable. Hence, there is a need to look for newer screening methods which are easier to perform and non-invasive. In view of the increasing incidence of this deadly disease, there is a need for effective early diagnosis of this disease. In this regard, Dermatoglyphics can be proved as a powerful tool to identify women with high risk of developing breast cancer. The relevance of Dermatoglyphics is to the identification of people with genetic predisposition to develop certain diseases. Here lies the importance of Dermatoglyphics in diseases and their practical application. If a meaningful association can be established, it may be of use in screening inexpensively populations at risk so that anticipation and early detection of symptoms can help in averting the disease or complications associated with the disease [3]. Thus, Dermatoglyphics can serve 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.

Material and Method

Selection Criteria: Hundred Breast Cancer patients were selected from the Tertiary Care Hospital of MMIMSR Mullana Ambala at random. Informed consent was taken from each individual participating in the research work along with other details such as Medical History, Family History, and Obs/Gyn History. Pedigree Analysis were also done of the chosen subjects to look for any family history of Breast Cancer and other risk factors. The research work has been approved by the Institutional Human Ethical Committee. All the cases belonged to age group of 18-60 years. Hundred age-matched Healthy Controls were also enrolled for comparison studies.

Dermatoglyphics

The method adopted for printing palm was modified ink method by Purvis Smith (1969). The materials used were printers, duplicating ink from, Cardboard roller, gauze pads and sheets of paper. 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 fingertips were rolled manually to ensure 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. Once the

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prints were obtained, 'atd' angles were drawn with the help of protractor and angles measured.

Method of '**atd'** angle measurement

In an arch: The triradius is the core and hence the count is zero.

Atd, adt, dat angles: A line was drawn from axial triradius 't' to the digital triradii 'a' and 'd' and all the three angles in the triangle were measured using a protractor.

Parameters observed: '**atd**' angle.

Result

Dermatoglyphic patterns of breast cancer patients enrolled in the present study were found to be a little on the higher side. The angles were found to be a little at the higher end >42º in case of breast cancer patients. The Dermatoglyphics of cancer patients were also compared with the healthy controls. The 'atd' angles of healthy controls were found to be mostly at the lower end, <42º as compared to the breast cancer patients. The mean 'atd' angle of breast cancer patient was found to be 48º and that of Healthy Control was found to be 39º as shown in Table 1.

Table 1: Mean 'atd' angle of Healthy Control and Breast Cancer females

Code no	Mean 'atd' angle
HC (N=100)	39°
BC (N=100)	48°

HC: Healthy Control, BC: Breast Cancer

Graph 1: Mean 'atd' angles of Breast Cancer and Healthy Control.

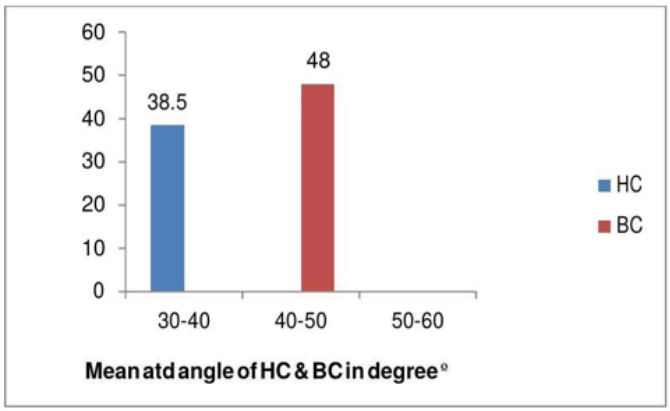


Fig 1: 'atd' angle of 35º in HC patient



Fig 2: 'atd' angle of 38 º in HC patient

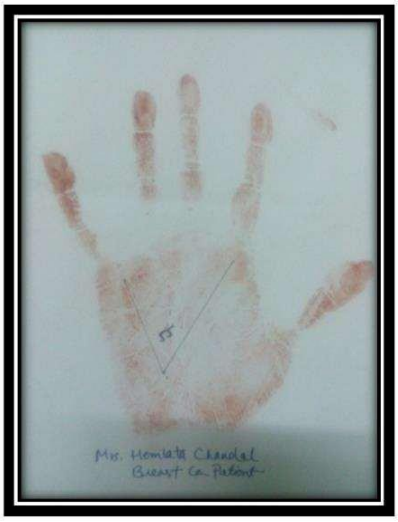


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Fig 3: 'atd' angle of 45º in BC patient



Fig 4: 'atd' angle of 55 º in BC patient



Conclusion

Dermatoglyphics is utmost importance for the clinicians to diagnose the genetic disorders especially congenital malformations and syndromes properly and Dermatoglyphics tool is clinically established tool to look for congenital malformations[4-6]. Thus, the potential of this tool in the screening for other diseases cannot be ruled out and the present study has attempted to look for Dermatoglyphics as marker of Breast Cancer. Dermatoglyphics patterns of Breast Cancer patients observed in the present study is a basic data that can be useful for further studies. There is a possible genetic influence on the Dermatoglyphic patterns of breast cancer patients. Long term studies and large sample size is required to come to a firm conclusion.

The anthropometric marker developed by this research work by using Dermatoglyphics tool of 'atd' angle measurement has huge potential as a diagnostic screening tool and it is very easy, cost effective and non-invasive parameter to screen high risk females of developing Breast Cancer as shown by the result. It is a much simpler method of screening and reduces the anxiety faced by females while opting for mammography and hence can aid the diagnostic procedure in huge way. Our work is supported by a similar work done by P.E. Natekar et al., 2006 and Shivaji B. Sukre et al., 2012 in which they performed different parameters of Dermatoglyphics including 'atd' angle on Breast Cancer patients and came to the same conclusion as ours of Breast Cancer patients having wider 'atd' angle [7-8].

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