

STUDY OF FINGERPRINTS PATTERN IN BREAST CANCER PATIENTS IN SHARKIA GOVERNORATE, A CASE –CONTROL RETROSPECTIVE CLINICAL STUDY.

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ABSTRACT

Background : Worldwide, breast cancer is the most frequently diagnosed life-threatening cancer in women. In less-developed countries, it is the leading cause of cancer death in women; in developed countries. Breast cancer is one of the most extensively studied cancers and its genetic basis is well established. Dermatoglyphic traits are formed under genetic control early in development but may be affected by environmental factors during first trimester of pregnancy. These patterns may represent the genetic make up of an individual and therefore his/her predisposition to certain diseases. The finger and palmar print patterns have already been studied with respect to various genetic diseases such as the Down's syndrome and Klinefelters syndrome. The fingerprints can thus represent a simple, non-invasive anatomical marker of breast cancer risk.

Methods : This study was applied to fifty histopathologically-confirmed breast cancer patients and their fingerprints patterns were assessed. At the same time, fifty age-matched controls were selected being have no self or family history of breast cancer and the observations were recorded and data were collected.

Result : It was observed that whorl pattern is the most common fingerprints pattern to be identified in breast cancer cases compared to controls. Also the quantitative difference in ridge count was statistically important.

Conclusion : The pattern of fingerprints may be a useful tool in the future in identifying and also screening of breast cancer.

Key Words : Breast cancer, Fingerprints, Genetics, Screening

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INTRODUCTION

Breast cancer is defined as the uncontrolled growth of abnormal cells in the milk producing glands of the breast or in the passages (ducts) that deliver milk to the nipples. Each year more than one million women are diagnosed with breast cancer worldwide over half of whom die from the disease. (1). Breast cancer is the most frequently diagnosed life-threatening cancer in women (2). The genetic component in breast cancer is well established and various genes like (BRCA1 and BRCA2), p-53 etc. have been extensively studied and identified as genetic links (3,4,5). Breast cancer could be screened using soft tissue mammography, breast ultrasound and magnetic resonance imaging (14). Studies are available suggesting that a family history of breast cancer might be associated with a specific fingerprint pattern (6-10). Fingerprint determination is genetic but

has been reported to be affected by the environmental factors in the first trimester of pregnancy. After birth the patterns remain more or less constant and hence may serve to study the genetic patterns in any individual (11). The fingerprints could thus be used for screening or to guide future research in this direction which can be used as a simple non-invasive method for screening breast cancer. The fingerprints of each individual are unique and even identical twins have different fingerprints pattern (11).

Method : This study includes 100 patients, divided into two groups (A & B). **Group A** includes 50 patients who were histopathologically confirmed that they have breast cancer and **Group B** includes 50 patients who were breast cancer free, they have no self or family history of breast cancer. After informed consent, the fingerprints pattern of both groups were collected using paper and ink method, patterns were identified and ridges were counted by

Forensic medicine consultant. There are five patterns of fingerprints which are (Whorls, Radial Loop, Ulnar Loop, Arches and Compound). The results were tabulated. The study was done in Zagazig University Hospitals.

patients and controls. It was commonly observed that the whorl pattern increased significantly in cases compared to controls in both right and left hands, being 48 % of total patterns in right hand of cases compared to controls which was 24 %, and 48 % in left hand compared to control which was 26% (Tables 1,2,3,4).

Results : The fingerprints pattern were identified and tabulated for both breast cancer

(Table 1) Fingerprints Pattern in the Right Hand of 50 Controls

Commonest Pattern identified	Number of Cases	Percentage
Whorl	12	24 %
Radial Loop	30	60%
Arch	4	8 %
Ulnar Loop	2	4 %
Compound	2	4 %
Total = 50		100 %

Table(2) fingerprints pattern in 50 breast cancer cases

Commonest Pattern Identified	Number of patients	Percentage
Whorl	23	46 %
Radial Loop	21	42 %
Arch	2	4%
Ulnar Loop	3	6%
Compound	1	2%
Total = 50		100%

Table (3) :Fingerprints Pattern in Left Hand of 50 Cases of Breast Cancer

Commonest Pattern identified	Number of cases	Percentage
Whorl	24	48 %
Radial Loop	21	42 %
Arch	2	4 %
Ulnar Loop	2	4 %
Compound	1	2 %
Total	50	100 %

Table (4) :Fingerprints Pattern in Left Hand of 50 of Control Group

Commonest Pattern Identified	Number of cases	Percentage
Whorl	11	22 %
Radial Loop	27	54 %
Arch	7	14 %
Ulnar Loop	2	4 %
Compound	3	6 %
Total	50	100 %

Also, the mean ridge count was calculated in all digits in both hands . The mean ridge count in right hand of cases was 9.78 and 15.16 in controls.the mean ridge count in left hand of cases was 10.92 and 15 in controls. (Tables 5,6,7,8).

(Table 5) Ridge count in Right Hand of 50 Breast Cancer Patients

Digit	Total ridge count	Mean Ridge count
Thumb	705	14.1
Index	505	10.1
Middle	410	8.2
Ring	430	8.6
Little	400	8

Mean Ridge Count in cases in right hand = 9.78

(Table 6) Ridge Count in Right hand of 50 Controls

Digit	Total ridge count	Mean ridge count
Thumb	975	19.5
Index	675	13.5
Middle	610	12.2
Ring	820	16.4
Little	710	14.2

Mean ridge count in right hand of controls = 15.16

(Table 7) Ridge count in Left Hand of 50 Breast Cancer Patients

Digit	Total ridge count	Mean Ridge Count
Thumb	630	12.6
Index	440	8.8
Middle	565	11.3
Ring	625	12.5
Little	470	9.4

Mean ridge count in Left hand of cases = 10.92

(Table 8) Ridge count in Left Hand of 50 Controls

Digit	Total ridge Count	Mean Ridge Count
Thumb	1025	20.5
Index	710	14.2
Middle	530	10.6
Ring	705	14.1
Little	800	16

Mean Ridge Count in Left Hand of Controls = 15

DISCUSSION

Breast cancer accounts for 29% of all cancers in women and is second only to lung cancer as a cause of cancer deaths in United States (12).

Breast cancer is defined as the uncontrolled growth of abnormal cells in the milk producing glands of the breast or in the passages (ducts) that deliver milk to the nipples. Each year more than one million women are diagnosed with breast cancer worldwide over half of whom die from the disease (1).

In some studies a pattern of six or more digital whorls was recorded more frequently in women with breast cancer than in those without the disease (11,13). The presence of six or more whorls was found to be significant as noted by 32.4% of breast cancer patients possessing this number of whorls as compared to 3.1% controls. Also of note is that 95% of subjects with six or more whorls either had cancer or were at high-risk. Similar results were obtained in the present study. Loops, arches and whorls are the common patterns observed in individuals.

Presence of Whorl pattern in the present study is also important for a different reason. It is seen that the whorl pattern frequency showed maximal changes as compared to other patterns

i.e. 4 % increase in the right digits in cancer patients as compared to controls.

Also. The mean ridge count was of statistical significance. It is shown that the mean ridge count in the right hand was less than that of controls, it could be used as a significant observation.

This relatively non-invasive technique can reasonably be used in selective non-symptomatic women (those with positive family history) as a part of definite risk assessment strategy with an ability to detect the earliest changes associated with developing cancer many years before the appearance of clinically assessed tumor and this may allow the introduction of more effective chemopreventive measures and early diagnosis and treatment in patients with breast cancer.

CONCLUSION

In conclusion , among fifty patients diagnosed as carcinoma breast patients , the whorl pattern was the most common fingerprints pattern to be repeated among these patients . Patients with breast cancer often have six or more whorls in their finger tips.

In the future , fingerprints can be a very simple,easy ,non expensive and non invasive method for screening breast cancer.

Women who at high risk to have breast cancer can seek help of specialized centers to

examine their fingerprints pattern and take the prophylactic measures as early as possible.

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