GSC Biological and Pharmaceutical Sciences
eISSN: 2581-3250 CODEN (USA): GBPSC2
Cross Ref DOI: 10.30574/gscbps
Journal homepage: https://gsconlinepress.com/journals/gscbps/

(REVIEW ARTICLE)

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BRCA1 gene mutation of breast cancer in Iraq: Review Article

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GSC Biological and Pharmaceutical Sciences, 2025, 31(01), 280-283

Publication history: Received on 16 March 2025; revised on 23 April 2025; accepted on 26 April 2025

Article DOI: https://doi.org/10.30574/gscbps.2025.31.1.0163

Abstract

Objective(s): The present study aims at conducting a systematic review of research articles which focus on brca1 gene mutation of breast cancer in Iraq.

Methodology: A descriptive, retrospective, study is carried throughout the present study using a systematic review of research articles as an appropriate technique. Convenient research studies on BRCA1 gene mutation of breast cancer are reviewed with respect to such topic.

Results: Analysis of the BRCA1 gene affords well forecast for the threat of emerging breast cancer in the yet to come. Different and frequencies vary between different populations and cultures.

Conclusion: The study concludes that BRCA1 gene mutation is confirmed to be considered a predisposing factor for developing breast cancer among females.

Recommendations: The existing study results will be valuable for future early testing investigations of this gene. To better identify genetic breast cancer in Iraq, more research is required, taking into account more studies and genes linked to breast cancer.

Keywords: BRCA1 Gene Mutation; Breast Cancer; Iraq; Analysis; BRCA2 gene

1. Introduction

The most prevalent malignancy among women is breast cancer. Different studies have deal with causing of cancer aiming to find an early judgment and to find the suitable therapy. Many studies have clarified the relation between two genetic polymorphisms named BRC1 and BRCA2 genes and the threat related that cause breast cancer between women patients in Iraq. In this investigation the participants was (25 women) patients with breast cancer,who joining AL-Kadhimya Teaching Hospital in Baghdad, and (10 women) it seems that healthy women as a control .All the participants women (control and patients) aged on high 40 years. The result analysis of the two genetics have discovered that the 185 del AG mutation percentage is 16 (4 patients) and the 5382 insC mutation percentage is 32 (8patients) in the gene BRCA1, while the mutation 6174delT percentage in BRCA2 gene existing in 3 patients (just 12%). this study confirm that the effect of BRCA1gene mutation 48% is greater than the gene BRCA2 12% in this sample of women with breast cancer in Iraqi([1]).

A focal high-penetrance gene, the BRCA1 gene is responsible for the larger part of genetic that cause breast cancer. Seventy women who are participating in a case-finding study are identified as having breast cancer. Approximately 42 factors, 20 on BRCA1 and 22 on BRCA2, have been found in 70 women. The BRCA1 gene contains four of the six (14–28

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percent) pathogenic alternates, which are of clinical significance. These are: c. 3607C> T, c. 3544 C>T, c. c, and 68_69del. DelAAAG (2) 224_227 [2].

The human gene BRCA1 is known as tumor suppressor gene (breast cancer type 1). All humans possess this protein, which is in charge of DNA repair. Descriptive research assesses BRCA1 protein expression in breast cancer and establishes its correlation with histological grades and stages. To check for BRCA protein expression, immunohistochemistry is applied to 70 cases of breast cancer. According to study results, 46 (65.7%) of the 70 cases of breast cancer have positive BRCA1 (overexpression) results. Moreover, the results of BRCA1 IHC staining are found to be significantly correlated with the age groups of women [3].

The BRCA gene is in charge of cell growth, division, and DNA damage repair, while the RCA1 gene has enhanced our understanding of familial breast cancer. The genes job are keep the healthy growth of breast, ovarian, and other cells. The altered versions of the two genes are unable to function ordinarily they may cause breast cancer, colon, and ovarian [4=6].

The hereditary breast cancers in early stage with an estimated risk between 57 to 81 percent while the hereditary ovarian cancers in early stage with an estimated risk 90 percent which caused by mutations in gene BRCA1in families with high incidences of ovarian and breast cancers. (Figure 1) [7].

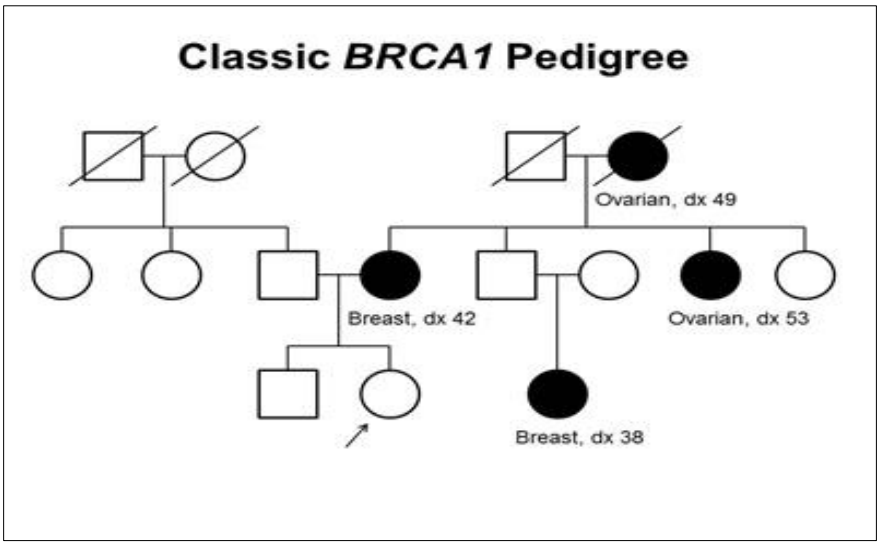

Figure 1 The BRCA1 lineage. This pedigree exhibits some of the typical characteristics of a three-generation family with a BRCA1 pathogenic variant, such as young onset and afflicted family members with ovarian or breast cancer. Some of these traits may be present in BRCA1 families. The figure illustrates how a BRCA1 pathogenic variant, which is an autosomal dominant syndrome, can be passed down through maternal or paternal lineages

It is estimated that by the age of 70, the risk and susceptibility to developing cancer can reach 70 to 90 percent due to mutations in this gene [8,9]. Populations and ethnic groups vary in the frequency and kinds of variations on this gene. In order to properly diagnose and treat the various cancers that arise from the BRCA1 gene, knowledge of its various variations is essential [10].Based on the early stated evidence, the present study has attempted to conduct a systematic review of research studies on BRCA1 gene mutation of breast cancer in Iraq.

2. Methodology

A descriptive, retrospective, study is carried throughout the present study using a systematic review of research articles as an appropriate technique. Convenient research studies on BRCA1 gene mutation of breast cancer are reviewed with respect to such topic.

3. Results

Research on the BRCA1 gene provides accurate predictions about the likelihood of promote breast cancer in a future. Diverse populations and cultures exhibit varying types and frequencies.

4. Discussion

There are many factors such as environmental, acquired and genetic are involved in breast carcinogen that development across various societies. All of these factors are important but the risk factor is the families with a clear history of the cancer,special the breast cancer throughout many generations. Genetics,like predisposing genes (oncogenes) to develop the breast cancer should be considered more [12].

Hereditary genetics risk factor is responsible for (3-10%) of all breast carcinogen cases and more than 30% of all early breast cancer disease. The patients who carriers BRCA1 gene mutation have a higher risk that develop the cancer,especially breast cancer and ovarian cancer. These mutations are regularly seen in patients with a family history in cancer and those affected by many site forms of the breast cancer. The mutations BRCA1 gene is responsible for 53% of families with the breast cancer, therefore, the spread of mutations in gene BRCA1are different in ethnic groups and also, affected by fundamental mutations[13].

BRCA1 gene mutations that cause breast cancer in patients with a possibility of 50% to 80%. Many studies have shown that the mutations in BRCA1 gene which caused breast cancer have a higher incidence, and higher lymphatic penetrance than the sporadic breast cancer [14] .

Carrier mutations in the gene BRCA1have increased the risk of developing the breast cancer and other malignancies, including colon gastric, pancreatic and melanoma cancers [15].

Female screening for reported mutations in oncogenes and predisposing genes like BRCA1 gene, which have been observed in women with breast cancer, appears vital due to the high prevalence of this illness in half of the world's population [12].

In a case-control study, conducted in Thi-Qar Province, results reveal that the mutation (185 del AG) in gene BRCA1 is found in the study group but in the control group, gene mutations of any type has not been detected. [16].

Numerous factors, including acquired, environmental, and genetic ones, contribute to growth the breast carcinogen in different societies. The genetic factors, like all genes that predispose the people to develop breast carcinogen, should be given more value than other factors in families who have a history of cancer disease spanning multiple generations([12] .

Up to 30% of the earlier breast cancer cases are caused by hereditary factors. The cancer especially ovarian cancer, are likely to affect people who carry the BRCA1 gene mutation . Those who suffer from multiple site forms of this disease and those with a family history are more likely to have these mutations. Though the frequency of BRCA1 gene mutations varies by ethnic group and may be impacted by fundamental mutations, the BRCA1 gene is the cause of breast cancer in 52% of families [13]. Women that have the BRCA1 gene mutations have more than 80% chance of developing the disease . Compared to sporadic cancer, the breast cancer that result from the BRCA1 gene mutation has a higher incidence and greater lymphatic penetration[14].

5. Conclusion

Based on the discussion of such review, the study concludes that:

- BRCA1 gene mutation is confirmed to be considered a predisposing factor for developing breast cancer among females.
- 2, It is determined that BRCA1 gene carriers have a higher risk of developing not only breast cancers and other cancers, such as ovarian cancer.

Recommendations

- Early detection of mutation carriers in these genes, in turn, can play an important role in its prevention.

- The existing research findings will be beneficial for future screening studies for this gene. Further studies are needed counting a larger number of studies and other related genes of breast cancer for better understand heredity breast cancer in Iraq.

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