

Incidence of Breast Cancer among Blood Groups of Women in the Holy Governorate of Karbala

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Abstract

Introduction: Breast cancer is a significant problem that affects women all over the world and is a leading cause of death among these patients. ABO blood groups are stable and vary by socioeconomic, geographical, and ethnic groupings. Blood type affects susceptibility and results. **Objective:** Previous studies have discovered a correlation between ABO blood type and Rh system as risk factors for breast cancer. **Aim:** To identify the association of breast cancer prevalence between women's blood groups and the Rh factor system in Karbala Governorate. **Materials and Methods:** A total of 1026 women were chosen, with 736 cases and 290 controls. The case group includes patients with breast cancer, and all of them had their cancer diagnosis confirmed by biopsy. The control group consisted of women who had never been diagnosed with cancer of breast. **Results:** Blood group type O (39.7%), blood group type A (26.1%), blood group type B (25.4%), and blood group type AB (8.8%) were the most common ABO blood types among cancer of breast patients. The percentages of groups of ABO blood for healthy donor control were as follows: blood group type O (40.0%), blood group type A (27.6%), blood group type B (21.7%), and AB (10.7%) with $P = 0.05$ or higher. There is a significant difference in the Rh factor between breast cancer patients and healthy control ($P = 0.003$). There were noticeable differences in age categories between patients diagnosed with breast cancer and the controls in this study ($P = 0.000$). **Conclusion:** There is no correlation between ABO blood types and breast cancer in this group of Iraqi women. There is a statistically significant difference, with a P value of 0.003, between patients diagnosed with breast cancer and healthy controls in terms of the Rh factor.

Keywords: ABO, blood groups, breast cancer

INTRODUCTION

Cancer of the breast is a serious public health issue that is prevalent among women all over the globe.^[1-4]

Previous research has shown that there is a connection between the ABO blood type and the likelihood of developing epithelial malignancies such as gastric cancer and pancreatic cancer.^[5,6] Breast cancer risk factors include characteristics such as age at menarche, length of time spent nursing children, number of children, age at menopause, nutrition, and hormone levels.^[7-10] Inflammation, immunological monitoring for cancerous cells, intercellular adhesion, and membrane communication are all possible reasons for the apparent connection between ABO blood types and the risk of developing cancer.^[11] In recent years, several research works have been carried out. All pointed to the existence of a connection between breast cancer and blood type. In contrast, due to the fact

that the findings were contradictory and there was a great deal of debate, and hence the purpose of this research is to determine whether or not there is a connection between breast cancer and the blood types ABO and Rh.^[11]

MATERIALS AND METHODS

During their examination and follow-up at the hospital, 736 breast cancer patients were studied at the Imam Hussein Medical City in the holy Karbala Governorate.

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A total of 290 ladies participated in a test group that donated blood to the Karbala central blood bank. By drawing three droplets of blood under sterile settings, all groups were categorized according to their ABO blood types. 1026 women were divided into four age groups: 30, 31–50, 51–70, and 71–90, with 736 cases and 290 controls, with a mean age of 44.29 years.

Study design

Case-control study.

Data analysis

Blood type, age group, and the presence or absence of cancer were all input into SPSS v.23 (IBM Corp. Released 2015. IBM SPSS Statistics for Windows, Version 23.0. Armonk, NY: IBM Corp). The Chi-square and *t* test were used to compare the groups. *P* must be less than 0.05 to be considered small.

Ethical approval

The study was conducted in accordance with the ethical principles that have their origin in the Declaration of Helsinki. It was carried out with patients verbal and analytical approval before sample was taken. The study protocol and the subject information and consent form were reviewed and approved by a local ethics committee according to the document number 3390 in November 23, 2020 to get this approval.

RESULTS

For both the case and control groups, Table 1 summarizes the results at the blood group level. As seen in Table 1, the distribution of blood groups in patients and controls is quite similar, with O having the highest frequency

(39.7%), followed by blood groups, A (26.1%), B (25.4%), and AB (8.8%). Type O (40.0%), type A (27.6%), type B (21.7%), and type AB (10.7%) were the ABO blood group percentages for the donor's healthy control. The best feasible outcome from the statistical study was that there is no significant link between blood classes (ABO) and cancer incidence ($P = 0.550$).

Table 2 shows the results of the frequency of the Rh factor in the case and control groups in this sample. In the case group, the percentage of Rh+ was (85.7%) and Rh– was (14.3%), whereas the control group had the following percentages: Rh+ (92.4%) and Rh– (7.6%). There is a statistically significant difference, with a *P* value of 0.003, between patients diagnosed with breast cancer and healthy controls in terms of the Rh factor.

The number of healthy and diseased people in four age groups is shown in Table 3. According to this data, 42.8% of all pathological cases were in the 30–50 age group, followed by 33.0% in the 51–70 age group, and 53.4% of all control groups were in the case group's highest overall age category. According to a statistical test conducted, the findings demonstrated a high correlation between the age groups and breast cancer prevalence ($P = 0.000$). This state, contrarily, verifies the role of age in the spread of breast cancer, as well as the impact of the number of tests and designs on detecting a breast cancer risk factor.

DISCUSSION

Many diseases, including malignancies, are influenced by genetic factors. Heredity has been shown to have a significant impact on breast cancer growth in recent decades.

There is a link between group A and pernicious anemia, according to Alevizos *et al.*^[12] In this study, group O had a greater incidence in cancer patients than group A, whereas both groups (O and A) had a higher frequency in controls with no statistical difference. The findings of this study contrast with those of the Diyala study, which found a link between type A blood and breast cancer.^[13]

Patients with breast cancer were highly associated with group A, followed by group O, according to the findings

Table 1: Blood group distribution in cases and controls

Blood group	Groups			
	Case		Control	
	N	%	N	%
A	192	26.1	80	27.6
B	187	25.4	63	21.7
AB	65	8.8	31	10.7
O	292	39.7	116	40.0
Total	736	100.0	290	100.0

$P = 0.550$

Table 2: Rh factor distribution among cases and checks

Rh factor	Groups			
	Case		Control	
	N	%	N	%
Rh+	631	85.7	268	92.4
Rh–	105	14.3	22	7.6
Total	736	100.0	290	100.0

$P = 0.003$

Table 3: Distribution of age categories among breast cancer patients and control group

Age categories/year	Groups			
	Case		Control	
	N	%	N	%
<30	145	19.7	66	22.8
30–50	315	42.8	155	53.4
51–70	243	33.0	67	23.1
71–90	33	4.5	2	0.7
Total	736	100.0	290	100.0

$P = 0.000$

of an Indian study,^[14] the percentages of Rh-negative women with breast cancer were lower than those with Rh-positive. There is a statistically significant difference, with a *P* value of 0.003, between patients diagnosed with breast cancer and healthy controls in terms of the Rh factor. According to the Shiryazdi *et al.* study,^[15] Rh levels in control groups are comparable to those seen in breast cancer patients with significant alterations. The incidence of breast cancer in the age group (30–50) and (51–70) is (42.8%), (33.0%) respectively. According to a statistical test, the findings demonstrated a high correlation between the age groups and breast cancer prevalence (*P* = 0.000).

CONCLUSION

There is no correlation between ABO blood types and breast cancer in this group of Iraqis, according to the statistics. There has been no indication of a relationship between blood types and breast cancer. It also has no effect on blood type as a risk factor for breast cancer, and it is not used as a predictor in breast cancer patients. There is a statistically significant difference, with a *P* value of 0.003, between patients diagnosed with breast cancer and healthy controls in terms of the Rh factor.

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Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Bevier M, Sundquist K, Hemminki K. Risk of breast cancer in families of multiple affected women and men. *Breast Cancer Res Treat* 2012;132:723-8.
2. Schmidt ME, Chang-Claude J, Vrieling A, Heinz J, Flesch-Janys D, Steindorf K. Fatigue and quality of life in breast cancer survivors: Temporal courses and long-term pattern. *J Cancer Surviv* 2012;6:11-9.
3. Sueta A, Ito H, Kawase T, Hirose K, Hosono S, Yatabe Y, *et al.* A genetic risk predictor for breast cancer using a combination of low-penetrance polymorphisms in a Japanese population. *Breast Cancer Res Treat* 2012;132:711-21.
4. Timmers JM, den Heeten GJ, Adang EM, Otten JD, Verbeek AL, Broeders MJ. Dutch digital breast cancer screening: Implications for breast cancer care. *Eur J Public Health* 2012;22:925-9.
5. Ishijima N, Suzuki M, Ashida H, Ichikawa Y, Kanegae Y, Saito I, *et al.* BabA-mediated adherence is a potentiator of the *Helicobacter pylori* type IV secretion system activity. *J Biol Chem* 2011;286:25256-64.
6. Feofanova AV, Oia V. The study of the frequency of AB0 blood groups in blood component donors and cancer inpatients. *Klin Lab Diagn* 2011;35-8.
7. Milne RL, Osorio A, Ramón y Cajal T, Baiget M, Lasa A, Diaz-Rubio E, *et al.* Parity and the risk of breast and ovarian cancer in BRCA1 and BRCA2 mutation carriers. *Breast Cancer Res Treat* 2010;119:221-32.
8. Li CI, Malone KE, Daling JR, Potter JD, Bernstein L, Marchbanks PA, *et al.* Timing of menarche and first full-term birth in relation to breast cancer risk. *Am J Epidemiol* 2008;167:230-9.
9. Lefta, Shurooq F, Asmaa K. Association of pregnancy loss with breast cancer in Babil Governorate's women. *Med J Babylon* 2022;19:15.
10. Al-Alawchi MSSF, Ridha Alkafaji HA. Evaluation of immunohistochemical expression of topoisomerase II alpha protein in patients with breast cancer and its correlation with different prognostic factors. *Med J Babylon* 2022;19:210.
11. Wu AM. Human blood group ABH/i, Le (a, b, x, y), and sialyl Le (a, x) glycotopes; internal structures; and immunochemical roles of human ovarian cyst glycoproteins. *Adv Exp Med Biol* 2011;705:33-51.
12. Alevizos A, Andrioti D, Askeridis E, Gregory S, Iliadi P, Karabli E. Public health in primary health system. *Epidemiological methodology issues of research and statistics*, eds PAPAIZISI 2007:197.
13. Aly R, Yousef A, Elbably O. Association of ABO blood group and risk of breast cancer. *J Blood Disorders Transf* 2014;5:1-4.
14. Saxena S, Chawla VK, Gupta KK, Gaur KL. Association of ABO blood group and breast cancer in Jodhpur. *Indian J Physiol Pharmacol* 2015;59:63-8.
15. Shiryazdi SM, Kargar S, Dehghan MA, Neamatzadeh H, Aboueiian-Jahromi M. Frequency distribution of ABO/Rh blood group systems in breast cancer, Yazd, 2007–2013. *Zahedan J Res Med Sci* 2015;17:e1024.