ASSOCIATION OF ABO BLOOD GROUP AND BREAST CANCER- A RETROSPECTIVE STUDY IN ERBIL CITY

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ABSTRACT

BACKGROUND

Different studies have been done worldwide to identify possible relationships, if any, between ABO blood group and breast cancer. They have concluded with different results.

The aim of this study was to identify possible association, if any, between ABO blood group and breast cancer.

MATERIALS AND METHODS

This is a cross-sectional study carried out in Erbil city, Kurdistan Region of Iraq over a period from November 2017 - May 2018. One hundred and twenty-two cases were included in this study. Data regarding patients' case sheet number, age, blood group and Rh factor were collected from the patients' case sheet and entered into the computer and then analysis was done.

RESULTS

The mean age group in our study was 48.42 ± 10.27 years. Our study showed highest association between Blood Group O and breast cancer, which was (50.8%) and the P was < 0.01 .

CONCLUSION

The present study revealed high association between Blood Group O and breast cancer.

KEY WORDS

ABO Blood Group; Rh; Breast Cancer.

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BACKGROUND

A high number of breast cancer cases are diagnosed every year.¹ Breast cancer is a worldwide malignant disease. Over one million new cases of breast cancers are diagnosed every year.² Although, there are several other factors having the risk of breast cancer, but ABO blood groups also have been associated with risk and survival of several malignancies including pancreatic cancer³ and stomach cancer.⁴ Initially, the association was found between stomach cancer and Blood Group A. Breast cancer is a multifactorial cancer. Established risk factors include a family history of breast cancer, age of menarche, age of first birth, duration of lactation, parity, age of menopause, total lifetime ovulations, diet and hormonal levels.⁵⁻⁷ One of the major antigens in humans is the blood group antigens that are present on the surface of the blood cells and different epithelial cells and alteration of these blood group antigens is associated with cancer.^{8,9} Therefore, blood group antigens on the surface of cancer cells can be used as useful prognostic and diagnostic markers in different types of human cancers.^{10,11}

Some studies report found no association between blood group and breast cancer risk.¹²⁻¹⁶ However, others suggest there are associations.¹⁷ Our aim in this study was to evaluate the possible relationships between ABO blood group and risk of breast cancer.

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MATERIALS AND METHODS

This research was conducted on an analytical base (retrospective hospital-based study). From November 2017 to May 2018, confirmed breast cancer cases were included in this study. 122 affected women with breast cancer who have documents in Erbil Breast Centre, which is located in Erbil city were studied to find out any possible associations between breast cancer and ABO blood group and to know the frequency of each blood group in relation to breast cancer. The data including age, confirmed laboratory investigations and the file codes were taken from the patient's case sheet. The data were entered into the computer and analyses of percentages were done. This study has been done after admitting ethical approval letter to the Local Ethics Committee of Kurdistan Board for Medical Specialties (KBMS).

Inclusion Criteria

- Female breast cancer.
- Confirmed pathology.
- Detailed case history report.

Exclusion Criteria

Patients with insufficient data sheet information have been excluded.

Data was analysed using the Statistical Package for Social Sciences (SPSS, version 22). Frequency or median values were given as descriptive statistics. Fisher's test was used to determine differences in proportions. Mann-Whitney U test was used to compare variables. A p-value of ≤ 0.05 was considered statistically significant.

RESULTS

The total number of the studied sample was 122 women affected with breast cancer. Their mean age $\pm$ SD was 48.42 ± 10.27 years, ranging from 27 to 78 years. The median was 47.5 years. The largest proportion (39.3%) was in the age group of 40 - 49 years, as presented in Table 1. Around half (50.8%) of the samples were of Blood Group 'O', 21.3% were of Group 'A', 16.4% were of Group 'B' and 11.5% were of Group 'AB' (Figure 1).

Age (Years)	No.	(%)
< 40	23	(18.9)
40-49	48	(39.3)
50-59	33	(27.0)
≥ 60	18	(14.8)
Total	122	(100.0)

Table 1. Distribution of Sample by Age

Figure 1. Distribution of Sample by ABO Blood Groups

Results showed that 86.1% were Rh positive and the rest (13.9%) were of Rh negative. The details presented in Table 2 show that out of the 122 breast cancer cases, 1.69% are in Group A-, 19.7% in Group A+, 1.6% in Group AB-, 9.8% in Group AB+, 2.5% in Group B-, 13.9% in Group B+, 8.2% in Group O-, and 42.6% in Group O+.

Blood Groups	No.	(%)
A-	2	(1.6)
A+	24	(19.7)
AB-	2	(1.6)
AB+	12	(9.8)
B-	3	(2.5)
B+	17	(13.9)
O-	10	(8.2)
O+	52	(42.6)
Total	122	(100.0)

Table 2. Distribution of Sample by Blood Groups

DISCUSSION

High frequency with Blood Group O had been discovered among breast cancer patients in our study. A significant P-value was found in this study.

This was also proved by other studies. A study showed positive relation between Blood Group O and breast cancer.¹⁸ Another study also reported that Blood Group O had a high risk of breast cancer.¹⁹ Another study has shown that Blood Group O has the second highest risk with breast cancer after Blood Group A.²⁰ Moreover, another study by Satyanam

Bhartiya et al²¹ shows higher frequency of association between Blood Group AB and breast cancer.

In contrast, a study has shown that women with Blood Group O have some protection against breast cancer.²²

We have some other inconsistent studies. For instance, a study by Guleria showed significant association between Blood Group A and breast cancer.²³ Another study reported by Murali shows a slight increased risk of breast cancer diagnosis in Blood Group A.²⁴

On the other hand, there are also other contradictory studies which show different results. Surekha et al have discovered that Blood Group B has highest incidence with breast cancer.²⁵

In contrast to all the above-mentioned studies, there are other different ones that show no significant relation between ABO blood group and breast cancer, Jayant K.²⁶ Also, Dede et al²⁷ and Stamatakis et al¹⁷ did not find such an association between blood groups and breast cancer.

A meta-analysis of 9665 breast cancer patients and 2,44,768 controls by Su-Yu MIAO et al that reviewed 14 studies in 2011 in many countries showed that ABO blood types had no association with breast cancer risk.¹⁹ Apart from this, other studies have also observed no association between ABO blood group and breast cancer.²⁸

In this regard, relevant studies have reported inconsistent results. For example, blood group and breast cancer were reported to have no correlation by Jayant K [11], while Surekha et al [29] concluded that breast cancer was more prevalent among individuals with blood group B. The tumour marker expressed by breast and stomach cancer cells is called Thomsen-Friedenrich antigen (T) and its precursor (Tn) which in healthy individuals are defeated and masked by the immune system. However, when a cell becomes malignant, the immune system can have access to them. There is a structural similarity between these markers and A antigen because terminal sugar N-acetylgalactosamine is shared by it [30]. Individuals with group A blood; therefore, give the least aggressive antibody response to these cancer cells, leading to poor outcomes [31].

CONCLUSION

Our study showed highest association between Blood Group O and breast cancer. There are controversies about possible relationship or association between ABO Blood Group and breast cancer.

Further researches and studies in large series are needed to discover or elucidate the relationship between ABO blood group and breast cancer.

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