

## **The Relation between the Blood Groups, Rhesus Factor, and Breast Cancer in the Holy Karbala Governorate**

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**Abstract—** The distribution ABO blood groups among patients with breast cancer were as follow: blood group type O (40.8%), blood group type A (25.0%), B (23.7%), and AB (10.4%), for the donor's healthy control, ABO blood groups percentages were as follow: type O (39.9%) type A (28.1%), type B (22.0%), and type AB (9.9%). There is no significant association between blood types ABO and the breast cancer. ( $P > 0.05$ ) Rh factor has a significant difference between patients with breast cancer and healthy control ( $P=0.002$ ). There were significant differences in age categories among patients with breast cancer and controls. ( $p= 0.000$ ) .

**Keywords—** ABO blood groups, Rh factor, Breast cancer.

### I. INTRODUCTION

Breast cancer is a widespread disease and is the second leading cause of death in the Western world, after diseases of the circulatory system and blood vessels. However, the occurrence of various malignant tumors varies according to age, sex and geography. Of all cases of female cancer in both India and the UK constitute breast cancer incidence is about 20-25%.(Anderson and Haas, 1984) .Previous researches suggest that there is a potential relationship between the ABO blood group and the risk of stomach cancer, pancreatic cancer and some epithelial malignancies (Feofanova and Volkova, 2011; Ishijima *et al.*, 2011). Other recent studies have shown a link between the incidence of duodenal ulcer, gastric cancer, and blood groups O and A individuals.(Iodice, 2010; Rasmi, 2009).The risk of breast cancer increases with age. Elderly Women people are more susceptible to the disease than that is rare in women under age forty. More than 80 % of breast cancer cases occur in women over the age 50 and 40% of women with breast cancer over the age 70 years (Dixon and Dixon, 2010). Breast cancer occurs because of genetic factors, hormone intake, leaving lactation, late menopause, diet, radiation, alcohol consumption and estrogen intake (Khan, 2014). The role of the ABO / Rh class has been examined as evidence of breast cancer in the past; however, the prognostic role of the blood group remains controversial and the data are surprisingly low (Donegan, 1972).It seems that antigens of

blood groups have an important biological role in the immune system to promote the development of certain tumors, including breast cancer, indicating that ABO blood groups may be important in the development of some malignant diseases (Costantini *et al.*, 1990). The aim of the study was to investigate the relationship between breast cancer and the blood groups ABO and Rh

### II. MATERIALS AND METHODS

The study was conducted at the Imam Hussein Medical City in the holly Karbala Governorate on 539 breast cancer patients during their review and follow-up at the hospital. A control sample of 313 women donated blood in the central blood bank in Karbala. Both groups were examined by taking three drops of blood in sterile conditions for classification according to ABO blood groups. The age mean of subject groups were  $43.08 \pm 1.37$  years and both groups (patients and control) were divided to four age categories included (<30, 31-50, 51-70, 71-90) independently.

### DATA ANALYSIS

Information obtained from patients include blood group type, age, presence or absence of cancer was presented to SPSS.v.23. Compare the groups analyzed by the Chi-square and t-test method. The P value should be considered less than 0.05 as significant.

### III. . RESULTS

Table (1) shows the results obtained from the blood group frequency for both patients and control groups. As shown in this table, the distribution of blood groups is very close in both cases and control groups, where O has the highest number of frequencies, followed by blood groups A, B and AB, in the following percentages (40.8%), (25.0%), (23.7%), (10.4%) respectively while for the donor's healthy control, ABO blood groups percentages were as follow: type O (39.9%) type A (28.1%), type B (22.0%), and type AB (9.9%). The result of the statistical analysis was the highest acceptable, with no significant association between the blood groups (ABO) and the incidence of cancer ( $P = 0.79$ ).

TABLE 1 The distribution of blood groups in cases and controls.

Blood group	Groups			
	patients		control	
	N	%	N	%
A	135	25.0%	88	28.1%
B	128	23.7%	69	22.0%
AB	56	10.4%	31	9.9%
O	220	40.8%	125	39.9%
Total	539	100.0%	313	100.0%

The results obtained from the frequency of the Rh factor, in the case and control groups of this study, are shown in Table (2), with the case group the percentage of Rh+ was (85.9 %) and Rh- (14.1 %), While the control group had the following percentages; Rh+ (93.0 %) and Rh-(7.0 %) The relationship between the Rh factor and the case and the control groups has significant differences  $p= 0.02$

TABLE 2 : The distribution of Rh factor between cases and controls

Rh factor	Groups			
	patients		control	
	N	%	N	%
Rh+	463	85.9%	291	93.0%
Rh-	76	14.1%	22	7.0%
Total	539	100.0%	313	100.0%

$P= 0.02$

Table (3) shows the number of healthy and patients in four different age groups. Based on this Table, 41.7 % of all cancer cases were in the 30 to 50 age category followed by 32.5 % in the 51 to 70 age group, whereas 50.5 % of all control groups in the highest same age category of the case group. According to a statistical test in the table, the results showed a significant correlation between age groups and the prevalence of breast cancer ( $P = 0.000$ ). This condition confirms the age factor in the spread of breast cancer on the other hand, confirms the effect of the number of samples and designs to find a risk factor in breast cancer

TABLE 3 The distribution of age categories among patients with breast cancers and control group

#### IV. DISCUSSION

Genetic factors play a key role in the development of

Age-categories/year $P= 0.000$	Groups			
	patients		control	
	N	%	N	%
<30	116	21.5%	84	26.84%
30-50	225	41.7%	158	50.48%
51-70	175	32.5%	69	22.04%
71-90	23	4.3%	2	0.64%
Total	539	100.0%	313	100.0%

many diseases, including cancers. Over the past decades, heredity has been shown to have a profound effect on the development of breast cancer. There is a relationship

between group A and pernicious anemia, as noted by Alevizos *et al.*, (2007). In this study, the incidence of group O was higher in cancer patients, followed by group A, also in controls, groups (O and A) were at a higher frequency with no significant difference. The results of this study differ with the study conducted in Diyala, which showed a significant relationship between blood type A and breast cancer (Aly, 2014). Results of the study conducted in India found that breast cancer patients were associated clearly with group A followed by group O (Saxena, 2015). Specifically, the percentages for women with breast cancer with Rh- were lower than those with Rh +. Rh percentages in the control groups are similar to those of women with breast cancer which has a significant difference and this result agree with Shiryazdi, (2015). There is a statistical relationship between increased risk of cancer and people with a blood type A, includes colorectal cancer, ovarian cancer, breast cancer, liver cancer, pancreatic cancer, prostate cancer and brain tumors except for bladder cancer. This does not mean that people from other blood groups are not exposed to cancer and do not develop it. This simply means that the immune system in people with A has fewer defenses against it, and that the cancer cells have certain qualities of type A make them almost invisible. (Rolfe, 2002).

#### V. CONCLUSION

This study concluded that there is no relationship between ABO blood types and breast cancer in this group of Iraqi population. It also does not affect blood type in breast cancer or other type of cancer as a risk factor and is not used as a predictive factor in breast cancer patients, although there should be more research on large numbers of patients to determine the effect of blood groups as a predictor in breast cancer patients .

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