

Relationship of Blood Groups (ABO & Rhesus) and Breast Cancer in Bangladesh

Ghulam Mostafa Khan¹, Md. Rahmatullah², Ishita Mostafa³

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Abstract

Background: The association of blood groups with breast cancer in our country is not fully established elaborately and large scale studies have not been carried out till now. Therefore this study was designed to find out the possible relationship of different blood groups with breast cancer. **Objective:** To determine the relationship of various types of breast cancer with ABO and Rh blood groups among the female patients of our people. **Materials and Methods:** This cross sectional study was conducted in the cancer unit of Delta Medical College and Hospital, Dhaka from January 2011 to February 2013. After proper and ethical consideration total 112 female patients with breast cancer were included in this study. Various factors like age, family history, metastasis, type of cancer were considered in this study. The blood groups of the patients were done by standard ABO and Rh typing methods (Forward & Reverse grouping by test tube method). **Results:** Among 112 breast cancer patients of our country, ductal breast cancer was found in 108 (96.42%) subjects, distant metastasis was found in 93 (86.9%) cases and positive family history in 70 (62.50%) subjects. **Conclusion:** Ductal type of breast cancer with positive family history and distant metastasis is common in different blood groups in our country.

Key words: Breast cancer; ABO & Rhesus blood group; Metastasis

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Introduction

Breast cancer is the one of the fatal malignant tumors and the important cause of mortality due to cancer in females. Many factors such as genetic factors, hormone consumption, lactation, late menopause, diet, radiation, alcohol consumption and exogenous estrogen intake have important role in the occurrence of breast cancer.¹⁻⁴ The blood group type is one of the genetic factors which affect the risk of different cancers. ABO blood group genes are mapped at chromosome 9q, in which the genetic alteration is common in many cancers.⁵

Studies of associations between tumor outcomes and the patient's ABO blood groups have shown

increased relative risks for some blood groups. There is however evidence that ABO blood groups may have importance, since the antigens of blood groups seem to have a significant biological role in the immunological system, thereby promoting the development of some tumors, including breast cancer.⁶ A history of breast cancer in first degree relatives was also found to be strongly associated with Rhesus negative blood type. Many studies have been carried out in different countries in different races to analyze blood factors and their possible association with breast cancer. Unfortunately, no appreciable research has been done so far in our country.

1. Professor, Department of Transfusion Medicine, Enam Medical College & Hospital, Savar, Dhaka

2. Assistant Professor, Department of Community Medicine, Delta Medical College, Mirpur, Dhaka

3. Lecturer, Department of Surgery, Saphena Women's Dental College, Dhaka

Correspondence Ghulam Mostafa Khan, Email: gmksa@hotmail.com

Materials and Methods

This cross sectional study was conducted in the cancer unit of Delta Medical College Hospital, Dhaka during the period of January 2011 to February 2013. After proper and ethical consideration total 112 female patients with breast cancer were included in this study. These patients had similar demographic, clinical, surgical, laboratory, and follow up data. This group of patients came from different parts of the country, so they are representatives of women among the general population. Blood specimens were collected from these women during their preoperative control and follow-up in the cancer unit. Factors like family history, clinical/surgical findings, blood group, histological findings (including type of cancer, degree of malignancy) and the presence of nodal and/or distant metastases were investigated. Both ABO and Rh blood groups were done by standard methods (Forward & Reverse grouping by test tube method).

Results

In the present study ductal breast cancer was found more frequently (96.42%) than lobular type of breast cancer (3.58%) (Table I). Family history was positive in most of the breast cancer patients (62.50%) (Table II). In this study, distant metastasis was found in 84.82% of the breast cancer patients (Table III). As only Rh blood group is concerned, Rh (+) patients with breast cancer were found to have increased frequency of metastasis (86.9%) (Table IV). In this study there was no subject with AB (-) group.

Table I: Blood groups and histological types of breast cancer

Blood Groups	Ductal type	Lobular type
A+	35	1
A-	3	0
B+	33	0
B-	1	0
AB+	14	1
AB-	0	0
O+	21	2
O-	1	0
Total	108 (96.42%)	4 (3.58%)

Table II: Family history of breast cancer patients

Blood Groups	Family history	
	Positive	Negative
A+	23	13
A-	2	1
B+	21	12
B-	1	0
AB+	10	5
AB-	0	0
O+	12	11
O-	1	0
Total	70 (62.50%)	42 (37.50%)

Table III: Frequency of metastasis in study subjects (n=112)

Blood Groups	Metastasis	
	Yes	No
A+	34	2
A-	2	1
B+	28	5
B-	0	1
AB+	13	2
AB-	0	0
O+	18	5
O-	0	1
Total	95 (84.82%)	17 (15.18%)

Table IV: Frequency of metastasis in breast cancer patients with Rh+ and Rh- blood groups

Blood Groups	Metastasis		Total
	Yes	No	
Rh+	93 (86.9%)	14 (13.1%)	107
Rh-	2 (40%)	3 (60%)	5
Total	95	17	112

Discussion

The role of genetic factors in the development of cancer is widely accepted. Alexander in 1921 reported that patients with blood group B and AB were more vulnerable to develop malignancy which can be more aggressive than neoplasms occurring in patients with other blood groups.⁷ Association between blood group A and gastric cancer has also

been found.⁸ This was subsequently confirmed by other investigators, which showed a further association between blood group A and pernicious anemia.⁹ Pandey et al showed an increased frequency of carcinoma of the gall bladder in blood groups A and AB.¹⁰ Regarding breast cancer, Vogel reported that ABO blood groups can potentially influence the prognosis.¹¹ ABO blood groups have been recognized as predisposing or prognostic factor in breast cancer by some other researchers also.¹²⁻¹⁵ It has been reported that A blood group is more frequent in patients with breast cancer in comparison with O blood group.¹⁶ One study with 368 breast cancer patients in India found high frequency of blood group O (34.92%), followed by B (28.57%), A (24.60%) and AB (11.9%).¹⁴ Another study by Akammu et al¹⁷ shows there is a negative relation between Rh D antigen heritage and the diffusion of breast cancer and the Rh D phenotype could be conservative against breast cancer. A study performed among 1001 patients with invasive breast cancer in 1995 by Holdsworth et al¹⁸ shows the B or AB blood groups to be a prognostic factor, especially in patients who are at high risk for early mortality or tumor recurrence with AB blood group showing a relation with higher local occurrence. A study performed by Jalali-Naduoshan et al in Zanjan, Iran in 2002 showed that there is a relationship between the B-antigen of the blood group and the poor prognosis of the breast cancer.¹⁹ A study in Uruguay reported that among women with Rh positive blood, those with a family history of breast cancer, type A blood group subjects were found to have more frequency of breast cancer than subjects with other blood groups.²⁰

In this study ductal type of breast cancer was found in 108 patients (96.42%) and distant metastasis was found in 93 (86.9%) cases. Seventy patients (62.50%) had positive family history of breast cancer. However, further studies with larger number of patients are needed to clearly establish the association of ABO and Rh blood groups with the breast cancer in female of our country.

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