Assessment the Relation between Breast Cancer and Blood Group

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الخُلاصـة:

الهــدف: لتقييم العلاقة بين سرطان الثدي ومجاميع الدم واعتبار مجاميع الدم أحد عوامل الإصابة بالمرض، معرفة أهمية المرحلة العمرية للمرأة وعلاقة العمر بسرطان الثدي.

المنهجيّــة: أجريت هذه الدراسة على (١١٥) امرأة ممّن شخّصن بإصابتهن بسرطان الثدي بمراحل مختلفة للمرض وبأعمار مختلفة. أخِذت عيّنات من الدَم من أولئك النساء لمعرفة مجاميع الدم لديهن وأخِذت كذلك (٢٠) عيّنة من أنسجة لأورام الثدي، حيـث أسـتعملت هـذه الأورام كمصدر لتلازن اللكتين مع كريات الدم الحمراء لمجاميع الدم المختلفة. أجريت الدراسة في مستشفى بغداد التعليمي ومستشفى الإشعاع والطـب النووي للمُدة من شهر كانون الثاني ٢٠٠٧ ولغاية حزيران ٢٠٠٧.

النتائــج: أظهرت نتائج الدراسة إنّ أعلى نسبة للإصابة بسرطان الثدي كانت لدى النساء بأعمار (٤٠–٥٩) سنه وإنّ إصابة النساء ذوات صنف الدم (AB) كانت أعلى نسبة وبفروق معنوية مقارنة مع باقي أصناف الدم. أثبت ذلك عن طريق تلازن كريات الدم الحمراء لجميع أصناف الدم كل صنف على حِدَه مع اللاكتين المستخلص من النسيج السرطاني.

التوصيات: إجراء الفحوصات المبكرة لجميع النساء وخاصة النساء بالمُدة العمرية بين (٤٠–٥٩) سنه لمعرفة الإصابة بالمرض إن وجـد فـي وقت مبكر وأخذ العلاج اللازم لتلافي التطورات وخاصة ذوات صنف الدم (AB).

Abstract

Objectives: To assess the relation between breast cancer & blood groups, identify the importance of women age group and the relation of age with breast cancer.

Methodology: The study was performed on (115) women who were diagnosed with breast cancer in different stages of disease and different ages. Blood samples were taken from them to demonstrate their blood groups and (20) fresh tumor tissue samples were obtained; the tumor tissue used as a source of lectin for hemagglutinate with erythrocyte of different blood groups. The study conducted at Baghdad Teaching Hospital and Radiation & Nuclear Medicine Hospital from January, 2007 through June 2007.

Results: The study shows that the highest percentage of women having breast cancer were at age (40-59) years and women with (AB) blood group with significance differences from other blood groups.

Recommendation: Early breast examination for women with age group (40-59) years &with blood group (AB) for early detection for breast cancer, and early treatment.

Key words: Breast Cancer, Blood Groups

Introduction:

Breast cancer is a prevalent and devastating disease worldwide. It is the most frequent cause of cancer in women [1], it is the second leading cause of female death after lung cancer [2]. Causes of breast cancer remain unknown, but numerous risk factors are correlated with its occurrence. In fact, interaction between multiple risk factor or repeated exposure to a single carcinogenic agent are responsible for its occurrence [3,4].

that are not routinely cleaned and disinfected represent a reservoir for transmission of HBV. Dialysis staff can transfer virus to patients from contaminated surfaces by their hands or through using contaminated equipment and supplies [6].

The nurse plays a critical role in preventing and controlling infection. This role begins with early detection and surveillance techniques [7]. Nurses, as the largest human resource element of healthcare system have a major role in providing an ongoing and high-quality care to patients [8].

Numerous studies have been performed using lectins to compare the surface of normal and cancer cells. It has been found that smaller amounts of certain lectins are required to cause agglutination of tumor cells than of normal cells [7]. In survey to the correlation between cancer and blood group appears that stomach and pancreatic cancer have the strongest association with blood type. Breast cancer may have an association with blood group, but different blood groups are associated with different manifestations of the disease [1].

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Methodology:

Blood group:

The type of blood was tested immediately according to Biotest company kit; through the detection of agglutination when occur between blood of patients and the serum of kit.

Heamagglutination between breast cancer tissue and blood groups:

-From the same samples prepare erythrocyte suspension for all blood groups by using anticoagulant (EDTA), after centrifugation for ten minutes at (3000 r.p.m.) the erythrocytes were washed with an appropriate amounts of normal saline four times, then the red blood cells were diluted with normal saline to give an absorbance of about (2) at (260 nm) by spectrophotometer [11].

- Five grams of breast cancer tissue were obtained by surgery, washed with normal saline, homogenized with (15 ml) of Tris-Hcl (5 minutes), then centrifugated for one hour at (5000 r.p.m.). The supernatant was stored at (-20) and used as a source of lectin for binding studies [7].

- The total protein in the extracted lectin was determined by using Bovine Serum Albumin (BSA) as standard at a concentration (40, 80, 120, 169, 200) Mg/ml according to the method of Lowry et al, 1951 [12].

- The last part was determination of total lectin binding to erythrocyte surface of different blood group was tested according to method of Fahad,1995 [7]:

(1ml) of extracted lectin diluted with (1ml) of Tris-Hcl buffer and incubated with (1ml) of washed erythrocytes at room temperature for(30mins), centifugated for (5 minutes) at (2000r.p.m.), then the supernatant was removed and the remaining blood cells were resuspended in (2ml) of Tris-Hcl buffer and allowed to sediment for (5mins), then the absorbance for the upper layer (free lectin and cells) was read at (620nm) by using the spectrophotometer and get the percent of total binding lectin to red blood cell (R.B.C.) surface by this low:

Total binding (%) =
Hemagglutination
$$\frac{\text{Absorbance of R.B.C.} - \text{Absorbance of R.B.C.} + \text{lectin}}{\text{Absorbance of R.B.C.}} \times 10$$

Statistical analysis:

Chi- square (χ^2) test was used to compare the results [13].

Results:

Table 1. Distribution of the sample according to their age groups

Age (year)	≥ 30	30-39	40-49	50-59	60-69	≤ 70
Number of women	4	21	38	30	15	7
Percent %	3.5 %	18.3 %	33.0 %	26.1 %	13.0 %	6.1 %

χ^2=41.65 (P<0.001) h.f.

Table (2) shows that the highest percentage (33%) in age group (40-49) years and (26.1%) in age group (50-59) years. While, the lowest percentage was in age group over than (70) years and less than (30) years.

Table 2. Distribution of the sample according to their blood groups

Blood group	Number	Percent
AB	52	45.2
B	29	25.2
A	18	15.6
O	16	13.9

χ^2=2.11, P. value is significant at (P<0.005)

Table (2) shows that the highest percentage (45.2%) of women with blood group (AB) in comparison with B, A, O blood groups which were (25.2%),(15.6%) and (13.9%) respectively.

Table 3. The percent of agglutinin of extracted lectin with each blood group

Blood group	Number of Women	Agglutination
A	5	84.4 %
B	5	90.2 %
AB	5	100 %
O	5	80.6 %

χ^2=2.362 P. value is significant at (P<0.005)

Table (3) shows that the agglutination assay was performed between blood groups (A, B, AB, O) every one alone with the lectin extracted from homogenous tumor cells from breast cancer women. The heist level of agglutination of extracted lectin was with blood group (AB) (100%), then blood group (B), (A), and (O).

Discussion:

The results of this study showed that the highest percentage in age group (40-49) years and in age group (50-59) years. While, the lowest percentage was in age group over than (70) years and less than (30) years (Table 1). The statistical analysis showed highly significant association between age groups (P<0.001). This result agrees with a study which showed that the incidence of breast cancer is rare in women aged under (30) year and above (70) years; due to the possible non-reliability certification data [14]. It was found that in women's tumor growth over the age of (70) years is typically slower [15]. Patients with breast cancer aged (30-39) years are (18.3%) which is approximately agreed with the results of a previous study [16] which show that only about (15%) of breast cancer in age before (40) year. While, it was showed that (85%) of breast cancer cases occur in women (50) year of age and older, and (5%) of breast cancer develop in women younger than age (40) year [15].

The results of blood group test to blood samples showed that the highest percentage for women with blood group (AB) in comparison with B, A, O blood groups (Table 2), and the statistical analysis showed a significant differences between blood group (AB) and other groups with (P<0.005). This result agreed with the study which found that patients with breast cancer increasing significantly with (B) & (AB) groups [17]. While, it was found no substantial [18]. In another study, it was found that the ratio percentage of blood groups in patients with breast cancer (64%), (77%), (73%) and (12%) for groups A, B, AB and O, respectively; no significant differences between them [19]. In two studies performed on Tunisian women

proposed that there was a small association between blood type (A) and breast cancer development [5]. These differences in the results may be due to either breast cancer may have an association with blood group, but different blood groups are associated with different manifestation of the disease; may show various risk or lack of risk associated with blood group [5], or the distribution of ABO blood groups varies in the different geographical and ethnic groups [6].

The extracted lectin of cancerous breast had significant hemagglutination activities toward human erythrocyte group (AB), then blood group (B), (A), and (O), (Table 3). The statistical analysis showed a significant differences (P<0.005) in the agglutination with blood group (AB) and other blood groups. This means that the lectin in tumor breast cells interact with the protein in blood group (AB) more than interaction with other blood groups. There are no other studies about lectin extracted from breast cancer, while it was found that the extracted lectin from cancerous kidney had significant hemagglutination toward erythrocyte group (A), this differences due to the variation of protein rate in different organs [7].

When measuring the total protein in the extracted lectin from homogenous cancerous breast tissue the range of total protein was between (4.2mg/ml) in low level and (12.5mg/ml)in high level and the mean for all samples was (9.0 mg/ ml), while it was found on cancerous kidney tissue that the concentration of total protein in cancerous kidney tissue was (15.6 mg/ml) [7].

Recommendations:

Early breast examination for all women, especially with age group (40-59) years and with blood group (AB) for early detection for breast cancer & early treatment.

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