

**Study Of Total Protein And Protein Profile In  
Patients With (Breast , Ovary and Uterus) Cancer**

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**Abstract :**

serum levels of total protein and protein profile were estimated in three groups of cancer patients : 17 patients with breast cancer , 13 patients with ovary cancer and 17 patients with uterus cancer , 7 pregnant women as pathological controls and 9 normal subjects. The results indicated the presence of significant decrease ( $P<0.05$ ) in albumin concentration in uterus cancer patients and in pregnant women and non significant difference ( $p>0.05$ ) in breast and ovary cancer patients as compared to normal subjects, also a non significant difference ( $p>0.05$ ) in total protein and globulin concentrations in all patients groups and pregnant women as compared to normal subjects.

**Introduction :**

More than 40% of female malignancies are gynecological cancers<sup>(1)</sup>. Gynecological cancer is one of the most serious public health problems in the world with the main gynecological cancers, cervical, breast and ovarian, causing morbidity with severe suffering and a high mortality<sup>(2)</sup>. A cancerous tumor that begins in a woman's ovaries is

called ovarian cancer. There are several types of ovarian cancer. Ovarian cancer that begins on the surface of the ovary (epithelial carcinoma) is the most common type. Ovarian cysts and tumors that are not cancerous can be found on the ovaries. Uterine cancer is the most common gynecological cancer. Breast cancer is the most common type of cancer and the most common cause of cancer-related mortality among women worldwide. Proteins are substances made up of two smaller building blocks called amino acids. The major site of synthesis of the plasma proteins is the liver. Total protein level depends on the balance between their synthesis and their catabolism or loss from body. A total plasma protein test measures total amount of protein in blood plasma as well as the amounts of albumin, globulin and fibrinogen. Under the influence of an electrical field, charged molecules and particles migrate in the direction of the electrode bearing the opposite charge. Because of their varying charges and masses, different molecules and particles of a mixture will migrate at different speeds and will thus be separated into single fractions. Therefore, the electrophoresis is especially useful as an analytical method. The measurement of serum/plasma protein concentration is one of the most frequent routine analyses performed to investigate hydroelectrolytic disorders, inflammatory or infectious diseases, colostrums intake, tumors, etc. Its determination is also prerequisite of protein electrophoresis.

The purpose of this article is to determine the total protein TP in plasma of patients with breast, ovary and uterus cancer comparing to normal subjects, evaluate the technique of quantitative and to investigate the effect of cancer on the plasma electrophoretic patterns in order to define average ranges. The advantage of reporting the qualitative appearances of the electrophoretogram with the concentrations of the electrophoretic bands, is indicated.

### Materials and methods :

#### Collection of blood :

All common laboratory chemicals and reagents were of analar grade, sera free of hemolysis were collected from all the target samples and stored at  $-20^{\circ}\text{C}$  until time of analysis. Nine females were taken from physically normal volunteers used as controls aged between (25-45) years, forty seven samples of serum were taken from patients cancers include : seventeen patients with breast cancer, thirteen patients with ovary cancer and seventeen patients with uterus cancer, aged between (25-45)

years. After being classified by senior surgery (patient suffering from any disease, that may interfere with our study were excluded). Blood was also collected from seven pathological controls (pregnant women ), aged (25-45) years. All patients were admitted for treatment to specialized surgical hospital.

### **Determination of serum proteins :**

The serum proteins were determined by electrophoresis technique in patients of cancer, pathological controls and normal subjects by Sherwin and Kohn methods.<sup>(13,14)</sup>

### **Statistical analysis :**

Descriptive statistics were used in analyzing the patients characteristics and laboratory parameters for each groups. In addition , unpaired student t – test was used to assess group differences , where appropriate .A statistical significant difference was accepted as p value less than 0.05 . All the statistical analysis in this study were made using SPSS 10.0 for windows program.

### **Results :**

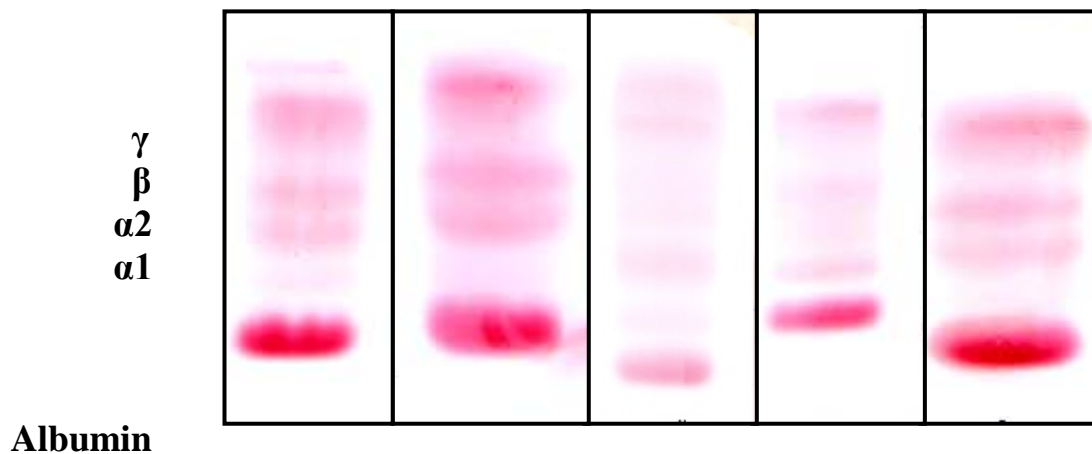
Table (1) show the results of (total protein , albumin and globulin) as (mean  $\pm$  SD) g / dl in the sera of breast , ovary and uterus cancer patients , pregnant women and normal subjects :

**Table (1) : Serum protein concentration in breast , ovary and uterus cancer patients and normal subjects.**

<b>Groups</b>	<b>No.</b>	<b>Total protein Mean <math>\pm</math> SD g / dl</b>	<b>Albumin Mean <math>\pm</math> SD g / dl</b>	<b>Globulin Mean <math>\pm</math> SD g / dl</b>
<b>Normal subjects</b>	9	70.222 $\pm$ 4.52	39.556 $\pm$ 3.94	30.667 $\pm$ 2.59
<b>Pregnant women</b>	7	64.714 $\pm$ 6.6	33.857 $\pm$ 5.79	30.857 $\pm$ 6.41
<b>Breast cancer patients</b>	17	72.353 $\pm$ 6.9	40.118 $\pm$ 5.75	32.235 $\pm$ 8.05
<b>Ovary cancer patients</b>	13	71.385 $\pm$ 9.74	36.23 $\pm$ 8.07	33.615 $\pm$ 6.33
<b>Uterus cancer patients</b>	17	66.47 $\pm$ 8.17	34.235 $\pm$ 6.61	31.765 $\pm$ 7.77

The results indicated the presence of significant decrease ( $P < 0.05$ ) in albumin concentration in uterus cancer patients and in pregnant women and non significant difference ( $p > 0.05$ ) in breast and ovary cancer patients as compared to normal subjects, also a non significant difference ( $p > 0.05$ ) in total protein and globulin concentrations in all patients groups and pregnant women as compared to normal subjects.

figure (1) shows the band of serum proteins of patients with breast , ovary and uterus cancer , pregnant women and normal subjects :



**Figure (2): serum electrophoresis pattern of cancer patients,  
Left : normal , pregnant , ovary , uterus , breast :  
Right.**

**Discussion :**

To our knowledge , few studies have been carried out to investigate the protein profile in cancer patients , most of the malignant tumors show an increase of globulins fractions due to increase of acute – phase proteins occasionally in end – stage patients <sup>(15)</sup> .The results of this study show no variation in the concentration of TP and globulin occurred in breast , ovary and uterus cancer , pregnant women as compared to normal subjects , these results disagrees with the study of many authors like ( Zainal 2001) <sup>(16)</sup> who studied the level of albumin and globulin in

patients with oral cancer , ( AL – Zaid 'S MK 1981 )<sup>(17)</sup> in intestinal lymphoma disease , ( AL – Jassem 1990 )<sup>(18)</sup> , this disagreement may be attributed to that the time sequence of appearance of plasma protein change<sup>(19)</sup> especially that our patients in first stage of disease<sup>(15)</sup> .

Also results indicated that there were significant decrease in albumin concentration in uterus cancer patients and in pregnant women and non significant difference in albumin concentration in breast , ovary cancer as compared to normal subjects.

The results of albumin concentration in uterus cancer patients and in pregnant women may be due to secondarily decreased synthesis of albumin by the liver<sup>(20)</sup> or Perhaps because a development attributed to poor nutrition and restricted calorie diet<sup>(21)</sup>. In protein electrophoresis each protein band , composed of several different proteins , respond to different physiological and pathological stimuli<sup>(22)</sup>, perusal of the original electrophoretic strip by a person well versed in the variations of individual proteins in health and disease , has been recommended , therefore , the original electrophoretic strip should be perused by an examiner well – versed in the changes. The appearance of the electrophoretogram should be reported , depending on the qualitative electrophoretic appearances and the clinical findings . To assess the degree of abnormality , or to study minor changes , quantitative data are necessary and these may be obtained by quantitative immuno – electrophoresis .

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دراسة البروتين الكلي و أجزاء البروتين في المرضى المصابين بسرطان (الثدي ، المبيض و الرحم)

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### الخلاصة:

تضمن البحث تقدير مستوى البروتين الكلي و أجزاء البروتين في أمصال ثلاث مجاميع من مرضى السرطان حيث شملت الدراسة : 17 مريضة بسرطان الثدي ، 13 مريضة بسرطان المبيض و 17 مريضة بسرطان الرحم ، 7 نساء حوامل كمجاميع سيطرة 9 نساء أصحاء . أظهرت النتائج أن هناك نقصان معنوي واضح ( $P < 0.05$ ) في تركيز الألبومين في النساء المصابات بسرطان الرحم و النساء الحوامل بينما لا يوجد اختلاف معنوي ( $p > 0.05$ ) في المصابات بسرطان الثدي و المبيض مقارنة بالأصحاء . لوحظ أيضا انه ليس هناك فروق معنوية في تركيز البروتين الكلي ( $p > 0.05$ ) و الكلوبولينات في مجاميع المرضى و مجاميع السيطرة مقارنة بالأصحاء .