

The Role of Serum C - reactive protein in Leukemic and Lymphomic Patients

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Abstract

Background : C-reactive protein is a sensitive major acute phase reactant in humans, whose synthesis in the liver is regulated by different cytokines . C-reactive protein is a common marker of inflammation plays a key role in the progression of human cancer.

Objective: To detect the level of C - reactive protein in sera of patients with leukemia and lymphoma (infected and uninfected with fungus).

Methods: Ninety six patients and hundred and fourteen control patients attended Medical city in Baghdad over period from Oct. 2005 to Dec.2005 were included in the study. Patients were divided into 2 groups according to the infected or uninfected with fungi, also 20 healthy volunteers were included in this study.

Results: The level of C - reactive protein in sera of patients was significant higher than the healthy control group (248.6+70.5) and (3.72+1.61) respectively with (p~0.05). Also the level of C - reactive protein in sera of patients was significant higher than the patients control group (54.3+28.14) with (p~0.05).

Conclusions: There was a significant increase in mean serum level of C - reactive protein in patients with fungal infections.

Key Words: C-reactive protein, fungi, leukemia, lymphoma.

الخلاصة

خلفية الدراسة: البروتين الفعال - سي يعتبر اكثر بروتين فعال وحساس في جسم الانسان ، ويتم تصنيعه في الكبد وينظم بواسطة سايتوكينات مختلفة . ان البروتين الفعال - سي هو مؤشر عام للالتهابات ويلعب دور مهم في تقدم السرطان عند الانسان .

هدف الدراسة :- ان الهدف من هذه من الدراسة هو لتحديد مستوى البروتين الفعال - سي في مصول المرضى المصابين بسرطان الدم وسرطان الغدد اللمفاوية .

طريقة الدراسة :- تشمل الدراسة 96 مريض (مصابين بالاصابات الفطرية) و 114 مريض (غير مصابين بالاصابات الفطرية) والمتواجدين في مدينة الطب للفترة من شهر تشرين الاول 2005 الى شهر كانون الاول 2005 وقد قسم المرضى المصابين بسرطان الدم وسرطان الغدد اللمفاوية الى مجموعتين نسبة الى وجود وعدم وجود الاصابة بالاصابات الفطرية ، اضافة الى المجموعة الضابطة السالبة والتي يشمل عددها عشرين .

النتائج :- ان مستوى البروتين الفعال - سي في مصول المرضى قد سجل مستوى معنوي عالي مقارنة مع المجموعة الضابطة السالبة (70.5 ± 248.6) و (1.61 ± 3.72)، كذلك كان مستوي البروتين الفعال - سي في مصول المرضى (المصابين بالفطريات) عاليا بالنسبة الى المجموعة الضابطة الموجبة (غير المصابين بالفطريات) (28.14 ± 54.3).

الاستنتاجات:- ان المستويات المصلية للبروتين الفعال - سي قد سجل ارتفاعا معنويا لدى مرضى السرطان المصابين بالاصابات الفطرية مقارنة بافراد المجاميع الضابطة السالبة .

Introduction

C-reactive protein is a common marker of inflammation plays a key role in the

progression of human cancer ⁽¹⁾. C-reactive protein (CRP) is a protein that is made in the liver and secreted systemically during the process of inflammation in response to the

inflammatory cytokine IL-6⁽²⁾. Plasma levels of CRP in the absence active disease are low, but can rise up to 1000-fold in patients with an inflammatory reaction such as infections and recent surgery⁽³⁾. Besides being a well-known non specific marker of inflammation, CRP itself has proinflammatory properties since it can activate the complement system^(4,5). The CRP test is considered a general test, not a specific one. In the other words, it can reveal that there is inflammation in the body, but it can not tell where it is⁽⁶⁾. Most sensitive c-reactive protein raised dramatically after M.I, stress, trauma, inflammation, surgery, neoplastic proliferation within 12-24 hr. and the level may be 2000 normal. Its determination is clinically useful for:

1. Screening for organic disease.
2. Assessing activity of inflammation disease as in romatoud arthritis.
3. Detecting inter current infection as in SLE and leukemia.
4. After surgery.
5. For detecting rejection of renal graft.
6. Serial determinations of c-reactive protein were detected in patients with fungal disease in order to determine its use as an aid to diagnosis^(7,8).

Patients and Methods

Patients

A prospective study was done during the period from (Oct.2005-Dec.2005) on the following main groups:

- A. Patients: included 96 patients with leukemia and lymphoma and infected with fungi, their age range (4-90) years.
- B. Control patients : included 114 patients with leukemia and lymphoma and uninfected with fungi, their age range (6-87)years

These patients were studied at which Baghdad Teaching Hospital, a total of 20 healthy volunteers were included in this study, their age range (19-54) years. A specialized oncologist for leukemia and lymphoma examined the entire study patients visit the hospital.

Methods

Quantitative measurement of serum C - reactive protein level.

Principle

The CRP reagent kit is based on an immunological reaction between C - reactive protein antisera bound to biologically inert latex particles a CRP in the test specimen. When serum containing greater than 0.8 mg/dl C - reactive protein is mixed with the latex reagent, visible agglutination occurs.

Procedure

*Qualitative test:

1. The reagent and controls were allowed to reach room temperature.
2. Reagent vial was shaken gently to disperse and suspend the latex particles in the buffer solution.
3. Forty microliter of undiluted serum was placed on one section of disposable slide, with positive and negative serum on the other sections of the slide.
4. A drop of latex reagent was placed next to the drop of serum. Both drops (serum and reagent) were mixed well with a stirrer sticks.
5. The slide was rotated gently for two minutes and read immediately under an ablique indirect light.
6. Looked for the presence of agglutination.

*Semiquantitative test:

This test was performed in the same way than quantitative test but using different dilutions of the serum sample (1:2, 1:4, 1:8, 1:16, 1:32, etc.).

Interpretation

A negative reaction is indicated by a uniform milky suspension with no agglutination as observed with the CRP negative control.

A positive reaction is indicated by any observable agglutination in the reaction mixture. The specimen reaction was compared to the CRP negative control (Biokit).

Statistical analysis

Analysis of data was carried out by using the available statistical package of SPSS.1105 (statistical package for social science-version 11.5). Data were presented in simple measures of mean, standard deviation, range (minimum-maximum values), independent student-t- test for difference between 2 means was used for testing the significance of difference between quantitative data of 2 groups, and analysis of variance (ANOVA) was used to test the significance of

difference of quantitative data for more than 2 groups . Statistical significance was considered whenever the P value was equal or less than 0.05.

Results

Table 1 shows the mean serum C - reactive protein concentration (mg/dl) in studied groups. In the present study, the serum level of CRP was evaluated in patients with fungal infections in comparison to patients' controls and healthy controls. The level of CRP in sera of patients was significant higher than the healthy control group (248.6+70.5) and (3.72+1.61) respectively with (p~0.05). Also the level of CRP in sera of patients was significant higher than the patients control group (54.3+28.14) with (p~0.05).

Table 1. The mean serum c- reactive protein concentration (mg/dl) in studied groups.

Values	Study group			P(ANOVA)
	Patients N=96	Patients control N=114	Healthy Controls N=20	
Serum C-reactive Protein conc. (mg/dl)				
Range	(140.2-358.1)	(5.3-102.2)	(1.22-6)	0.05<P
Mean	248.6	54.3	3.72	
SD	70.5	28.14	1.61	
SE	7.59	3.41	0.36	
T test				
Patients controls X Healthy Controls :p<0.05				
Patients X healthy controls :p<0.05				
Patients X healthy controls :p<0.05				

Discussion

In the present study, significant increase in the level of C - reactive protein in patients groups (p<0.05). The blood level of C - reactive protein is elevated in patients with infection, inflammatory diseases, and malignancies (7, 8). Most systemic microbial infections were associated with high levels of serum C - reactive protein; systemic fungal infections

occurring in immunodeficient hosts were also associated with high C - reactive protein values (9, 10). In patients with inflammatory conditions such as infection, cytokines induced the production of CRP in hepatic cells and CRP level was increased in those patients (11). Also Grutzmeier and Von-Schenck, 1986; Hambach et al, 2002 showed that the C - reactive protein levels were high during fungal infections (12, 13). Timonen and Koistinen, 1985 showed that the CRP

proved most valuable in the follow-up of infectious, in the detection of infectious complications and in the detection of possible invasive fungal infections⁽¹⁴⁾.

Conclusion

There was a significant increase in mean serum level of C - reactive protein in patients with fungal infections.

Recommendation

Further studies of HLA-typing for patients with fungal infection are recommended.

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