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Evaluation the Level of Interleukin – 2 and some Haematological Parameters in Some Patients with Bronchitis in Al Hussein Teaching Hospital

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Abstract

The present study was carried out at the laboratories of Al-Hussain Teaching Hospital , it aimed to evaluate the levels of interleukin- 2 by ELISA technique ,and some hematological parameters such as total white blood cells counts ,packed cell volume value ,and haemoglobin concentration) in some patients with Bronchitis in Thi-Qar province . The subjects of the present study consisted of patients group with Bronchitis (70) and their aged between (17-60) years, and (70) persons as healthy group .When we analyzed the results it showed correlation between the occurrence of Bronchitis and high levels of IL-2 .In addition the count of wbc in blood of patients was high significant increase ($p \leq 0.05$) in total count of WBCs between healthy and patients group .While the results lack significant differences ($P \leq 0.05$) in the rates of the values of the hemoglobin and packed cell volume in all patients Bronchitis , compared with the healthy group.

Key words: Bronchitis, Interluken-2, Haemoglobin, Packed Cell Volume.

تقدير مستوى انترلوكين –2 وبعض المعايير الدمية لدى بعض مرضى التهاب القصبات في مستشفى الحسين التعليمي \ محافظة ذي قار

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الخلاصة

أجريت الدراسة الحالية في مختبرات مستشفى الحسين التعليمي \محافظة ذي قار . وهدفت إلى تقييم مستويات الإنترلوكين 2 بتقنية الاختبار المناعى المرتبط بالانزيم وبعض المؤشرات الدمية مثل(العدد الإجمالي لخلايا الدم البيضاء وقيمة حجم تراص الخلايا الحمر وتركيز الهيموجلوبين) لدى بعض مرضى التهاب الشعب الهوائية في مستشفى الحسين التعليمي / محافظة ذي قار. تكونت عينة الدراسة من مرضى التهاب الشعب الهوائية وعددهم (70) وتتراوح أعمارهم بين (17-60) سنة، و70 اصحاء (مجموعة ضابطة). وبعد تحليل النتائج بالتحليل الإحصائي أظهرت النتائج وجود علاقة بين الإصابة بالتهاب الشعب الهوائية وارتفاع مستويات الإنترلوكين 2. بالإضافة إلى ذلك، كانت نتيجة اختبار كريات الدم البيضاء في مجموعة المرضى مرتفعة مقارنة بمجموعة السيطرة (الاحتمالية اقل او تساوي 0,05) . بينم اختبار كل من الهيموكلوبين وحجم تراص الخلايا الحمر كانت ذات قيم غير معنوية في كل من مجموعتي السيطرة والمرضى.

1. Introduction

Bronchitis a respiratory ailment called bronchitis causes the bronchi to become inflamed and the excessive amounts of mucus were secrete from airways. This overabundance of mucus production frequently results in a partial blockage of the airways. Acute bouts of pneumonia are self-limiting and brief, but chronic cases include repeated productive cough episodes [1]. Chronic bronchitis defined as a long-lasting creative cough permanent extra than three months and happening within a period of two years. There is a robust fundamental correlation by smoking, and it is often secondary to chronic obstructive pulmonary disease [2]. Currently, one of the biggest avoidable health hazards in the globe is air pollution. According to the World Health Organization (WHO), it is a silent killer. While harsh Bronchitistics have symptoms that are more continuous in spite of treatment. In patients with symptomatic Bronchitis levels of IL-2 are increased[3] . [4] denoted that, increasing bronchoalveolar lavage cell expressions explains presence of IL-2 m –RNA. It has been also reported that high level of IL-2 positive bronchoalveolar lavage cells are noticed in Bronchitistics with steroid resistant, compared with steroid sensitive Bronchitistics [5]. A considerable increase in IL-2 mRNA- positive cell is noticed after allergens challenge in Bronchitistics [6] . The biology of IL-2 is captivating because it plays important role in both controlling and promoting T cells functions and responses. Cytokine levels offer a convenient and easy way to measure inflammation of the respiratory system[7]. WBCs, are important markers of the inflammatory response[8, 9] .In this study we want to evaluate some immunological parameters as IL-2 and hematological parameters such as WBC ,PCV,HB in some Bronchitis patients . Also knowing the relationship between immune statuse and blood parameters and their effect on the patient's condition.

2. Methods and Materials

1- A total of 70 Iraqi Bronchitis patients their age between (15-55) years and (70) individuals as a healthy group.

2- Samples collection: Samples were obtained from controls and patients (5 ml) by disposable syringes from vein. The one sample was divided into two parts, one of
them put in plane tube , at room temperature , and then placed in centrifuge at 4000 r.p.m for 10 minutes , then serum samples were transferred cautiously to tubes in deep freezing until used . The other part of blood sample was placed in EDTA tube in order to measure the rate of Hb ,PCV and account the total WBCs
3- The concentration of IL-2 was estimated by ELISA.

3. Results

3.1 Serum IL-2 concentration

The current study showed a significant increase at $p < .05$ in the rate of IL-2 level in serum of Bronchitis patients, compared with its level in the serum of healthy group, as in table 1.

Table 1- Comparison of serum (IL-2) level (pg/ml) of the patient group and healthy group

IL-2 concentration	Subjects	No	Mean	T value	Df	P-value
IL- 2	Patients	70	37.16	278.14274.	69	< .00001 s
	Control	70	17.23		69	

***IL-2 concentration pg/ml**

3.2 Hematological Parameters

The current study showed that there is no significant differences in Hemoglobin concentration and Packed Cell Volume percentage in patients with Bronchitis compared with the control group, the Hb concentration was (13.325) g /dl for patients and (12.50) g /dl for control group correspondingly .The PCV percentage was (35.32)% for patients and (37.33)% for healthy group respectively , as in the table (2).

On the other side present study demonstrated significant difference in WBCs rate between studied groups, where the WBCs count equal (11.71) X103 cell/ml for patients and (4.95) X103cell/ml for control group. In (Table 2) the results were expose that the WBCs count high in patients group compared with healthy group.

Table 2- Some hematological parameters for Bronchitis patients and healthy control groups

Parameter	Subject	No	Mean	Df	p- value
HB(g /dl)	Patients	70	13.325	139	0.102
	Control	70	12.50		
PCV(g /dl)	Patients	70	35.32	139	0.27
	Control	70	37.33		
WBC(cell/ µl)	Patients	70	11.71	139	0.02
	Control	70	4.95		

4. Discussion

The consequences of the present study presented a high level of of IL2 concentration in the Bronchitis patient group compared to the healthy group, this results agree with[10] who reported that hyperproduction of IL-2 in patients which endure even during the time when the illness is remission. Also this result agree with [3] who reported the levels IL-2 are increased in the fluid of bronchoalveolar lavage in patients with Bronchitis . That result occurs perhaps because of the nature of Bronchitis disease where eiosinophill cells are in high number and it considers the source of IL-2 secretion.

The concentration of Hb was somewhat lower in the control group as matched to patient groups , then there was no statistical difference .Therefore the results of the current study showed a lack of significant differences of the levels of Hb between the two studied groups of patients and healthy control group ,this finding agrees with[11].

No significant differences of the value of PCV between the two groups of patients and healthy control group, this finding agree with[12].

There was a significant difference in the number of WBCs between Bronchitis group and the healthy group, the increasing in WBCs possibly due to the immune system response to look the inflammation in the infected tissues. This result agree with [13],[11, 14] . Perhaps this finding due to those WBCs might release great amounts of histamine in the lungs and it most important producer of pus cells. Histamine is one of the inflammatory compounds that are in charge to causes runny / watery nose and out of breath throughout allergic reaction.

5. Conclusions

After conducting the current study, it is necessary to review the conclusions obtained, which include high level of interleukin-2 in the patients group compared to the control group. Also, among other conclusions, the ratio of white blood cells in the patient group is greater than it is in the control group. Finally, it was concluded that there were no significant difference in the ratios of hemoglobin and packed cell volume in both patients and healthy people.

Recommendations

After reaching the above-mentioned results, we recommend conducting subsequent studies to measure the level of other interleukins, such as 6 and 17, to evaluate the immune status of bronchitis patients. We also choose other measures such as CRP, ESR, differential count of granular and granulocytic WBCs, and the percentage of RBCs and platelets.

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