

## EVALUATING CRP AND SOME HEMATOLOGICAL PARAMETERS IN COVID-19 PATIENTS IN THI-QAR PROVINCE

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### Abstract

The Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-Cov-2) appeared in the city of Wuhan, China at the end of 2019, which named COVID-19. In the present study we collected 50 samples from COVID-19 patients those who attend the Respiratory Diseases Center in Dhi Qar Governorate\ South of Iraq. The current study aimed to find out the concentration of C-reactive protein in the group of patients, and we also wanted to show the changes in the complete blood count reading that occurred in the patients. Where the obtained results were compared with 50 samples taken from apparently healthy people as a control group. Patients were diagnosed based on the clinical features, computed tomography of the lungs, nasopharyngeal swab samples and antibody testing IgG, IgM. After analyzing the results, high levels of CRP were found in the patients group, which was (40.2864) when compared with the control group (4.7857). White blood cells tends to be somewhat low compared to its normal values when the mean of it in patients group was (4.6), while in control group the mean of it was (8.8). The level of lymphocyte was decreased in patients group, where the result was significant where  $p = .012179$ . The mean of lymphocyte in patients group was 0.76 ,while in control group was 3.9. Neutrophil mean was analogous in tow studied group. The mean of eosinophil was low in patients group (0.42) when we compared it with control group (5.00), as the  $p$ -value= .002504 .Hematocrit result was low in patients group (33.2) than in healthy group was(51),as  $p$  value was  $< .00001$  .The result of current study also exhibited that level of Red blood cells was analogous in two studied groups where it appears in normal range in patients group(4.25) and in control group.

### Introduction

The occurrence of corona virus -19 at the end of 2019 has had an important effect on the world. The main causative factor , a beta coronavirus called SARS-CoV-2. It has the ability to transmit and causes respiratory symptoms in humans range from mild to severe [1]. The main recognized case of SARS-CoV-2 in China Wuhan (Hubei province). From the symptoms which shown to patients are cough, sore throat, breathlessness, fatigue and fever among others [2]. Like to SARS, COVID -19 disease severity is definitely associated with age enlarged, previous comorbidities, and other ecological factors[3].Some authors showed that the lymphocyte, neutrophil, and platelet counts are clinically beneficial in classifying patients[4]. Ramachandran *et al.*[5] found the distribution of Red Blood Cell was width among the patients COVID-19 collected from academic medical center in New York City. Neutrophil-to-lymphocyte ratio (NLR), one of the CBC parameters, appeared to be a measure of inflammation and was linked to hospital readmission in previously discharged COVID-19



patients [6].CRP belong to an acute phase proteins, its product regulated by pro-inflammatory cytokines .It is produced by hepatocytes and adipocytes [7]. It is an antibody which is a section of non – specific immune responses and growing quickly during the acute phase response .It's growing indication that CRP cause promotes damage in tissues throughout the inflammatory responses in definite pathological conditions [8]. While CRP contended as a vital indicator of disease development in COVID 19[9]. High levels of serum CRP detected in patients with COVID 19 and uses to help through prognostication and detecting [10] CRP is a nonspecific acute phase protein which is made in hepatic cells and been raised in inflammation [11]. Whereas CRP has been contended as significant indicator of disease development in Covid-19[12]. CRP expression level is typically little but growths quickly and significantly through acute inflammatory process [13]. Laboratory results, particularly complete blood counts show central role with an infectious diseases. As the examination into the new COVID-19 remains to grow[14]. The goal of the study was to examine the potential role of CRP parameters as diagnostic and prophetic biomarkers in COVID-19 patients. We also aim to report significant changes observed in CBC results with the confidence that this report will offer useful evidence for all clinicians about COVID-19 patients.

### Materials and Methods

This study includes 50 persons attending the respiratory center in Thi-Qar,Iraq who were infected with coronavirus. Patients were diagnosed based on the clinical features , computed tomography (CT) of the lungs, nasopharyngeal swab samples and antibody testing IgG , IgM.

### Statistical Analysis

The Statistical Package for the Social Sciences-22 was used to gauge statistical analysis. The mean was used to express the normal distribution measurement. To match the means of the studied groups, the independent T test was employed.

### Results

A total of fifty COVID-19 confirmed cases had their data examined. The study's sample population had a median age of 43 years and the mean was 47.85. The subject of this study included data from 26 males and 24 females were used to analyze the results. The maximum age was 71 years, while the minimum age was 18 as shown in Table 1. The laboratory results showed high levels of (CRP) where the result of it in patients group was (40.2864) when compared with control group(4.7857) .The result was significant as p-value was <0.0001,see Table 2. As shown in Table 3 WBC tends to be somewhat low compared to its normal values when the mean of it in patients group was (4.6),while in control group the mean of it was (8.8). The level of lymphocyte was decreased in patients group where the normal value of it was(0.80-4.00),where the result was significant where  $p = .012179$ .The mean of lymphocyte in patients group was 0.76 ,while in control group was 3.9. Neutrophil mean was analogous in tow studied group. The mean of eosinophil was low in patients group (0.42) when we compared it with control group (5.00), as the  $p$ -value= .002504 . As shown in table 3 about HCT result was low in patients group was (33.2) than in healthy group was(51),as  $p$  value was



< .00001 .The result of current study also exhibited that level of RBC was analogous in two studied groups where it appears in normal range in patients group(4.25) and in control group (5.25)

**Table 1: Data of COVID-19 patients**

Mean	47.85
Median	43
Minimum	18 years
Maximum	71 years
Female No	24
Male No	26

**Table2:CRP results for all studied groups**

Parameter	Subject	No	Mean	Df	P-value	CI
CRP	Pateints	50	40.2864	49	<0.0001	20.4652 to 50.5362
	Control	50	4.7857	49		

**Table 3: CBC results of all studied groups**

Parameter	Subject	No	Mean	Df	P-value
WBC	Pateints	50	4.6	49	.021241
	Control	50	8.8		
Lymphocytes	Pateints	50	0.76	49	.012179
	Control	50	3.9		
Nutrophill	Pateints	50	64.1	49	.003822
	Control	50	66.15		
Eosinophil's	Pateints	50	0.42	49	.002504
	Control	50	5.00		
HCT	Pateints	50	33.2	49	< .00001
	Control	50	51.0		
RBC	Pateints	50	4.24	49	.000063.
	Control	50	5.25		
Hb	Pateints	50	12.25	49	.002208
	Control	50	13.00		

### Discussion :

In our study, 43 years was the median age. There are many authors have studied an elderly patients' median age of 50-57 years [15, 16].When we tested CRP to the patients group, we found high levels of CRP (40.2864) (Table2). The reason for this increase is the infection of the body with Covid-19. CRP recognized as one of an important effector molecules of immune response named cytokine storm[17, 18]. Like when someone has a bacterial infection it is notable that CRP levels in plasma rise to an extent in SARS-CoV-2- disease[19]. A number of researchers have indicated the possibility CRP apheresis can decrease levels of circulating



CRP effective and fast [20]. In addition to what was mentioned above[21]denoted more patients with lung damage have high levels of CRP.

As shown in table 3 the result of WBC tends to be somewhat low compared to its normal values, which range between( 4-10 ) cells per milliliter of blood. Perhaps this result because the study sample have severe case of Covid-19 ,among the evidence that supports this is the low number of lymphocytes, which is one of the types of white blood cells, in the study sample. Where lymphocytopenia appears in 90% of severe COVID-19 cases[22]. Lymphocytes are an essential subset of WBC as cellular elements of immune response in the body, the central player of more all immune system functions of the lymphatic system, and check mutations in cells in the body and a soldier which fight outside infections. The CBC results of present study showed decrease lymphocyte levels in patients group our result agree with [23] ,where researchers revealed that the total of lymphocytes reduced in patients with severe Covid-19. In our present study the levels of neutrophils were analogous among patients and healthy subjects this result agree with [24]. As shown in table 3 eosinophil's were low level in patients group this result agree with [25].

As for the result of HCT was low in patients group than in healthy group, our result agree with[26]. As for the result of RBC the current study showed that the percentage of it is normal. Despite the effect of the virus on red blood cells, we did not notice a change in their percentage in both patients and control groups. The first reason for this may be due to the average age of the sample being 47.85. The second reason due to the percentage of Hb was normal in patients group , where the positive relationship between Hb and RBC. The result agree with[27]. Where the researchers indicated in their study, when they divided the study sample into a group of age groups, that the percentage of Hb is normal at ages that ranged between 55- to 64 years as Hb=12.5 g/dL). The last result of Hb had an effect on the previous result of RBC.

### Conclusion

The CBC of 50 common and mild COVID-19 cases were displayed in the current investigation, and abnormal WBCs, Lymphocytes, Nutrophill ,Eosinophil's, HCT,RBC, and CRP levels were the utmost prevalent laboratory results in these COVID-19 patients. When interpretation the CBC of COVID19 patients, physicians must take these aspects into interpretation of results.

### Conflict of Interest

The authors declare that they have no conflict of interest

Supplementary material

All data generated or analyzed during this study are included in this published article

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