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ASSESSMENTS OF SOME BLOOD PARAMETERS IN FIFTY-FIVE PATIENTS INFECTED WITH CORONAVIRUS ADMITTED IN AL-HILLA TEACHING HOSPITAL

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Abstract:
Coronavirus disease 2019 is become a worldwide pandemic since December 2019. The most common symptoms of coronavirus patients are fatigue, fever, dry cough, and shortness of breath. The aim of this study is to determine the levels of serum ferritin, erythrocytes sedimentation rate (ESR), and C - reactive protein (CRP) in coronavirus infected patients. A total of fifty-five patients infected with coronavirus in Al-Hilla teaching hospital were randomly chosen for this study. Results showed that the levels of ESR and CRP were significantly higher in coronavirus infected patients than the normal range. Also, individuals with blood group A are highly associated with coronavirus infection. We concluded that the level of ESR and CRP could help the physicians to diagnose coronavirus patients. However, further research on a large population is needed to validate the data.

Keywords: Coronavirus disease 2019, infection, diagnosis.

INTRODUCTION:

Coronavirus Disease (Covid-19) is a currently pandemic viral infection which causes a severe respiratory syndrome. Coronavirus is a non-segmented single stranded RNA positive sense and various studies have been conducted to find out the origin of this virus. It has been reported that bats are the reservoir hosts for coronavirus [1]. However, coronavirus epidemic was reported since 2003 in Guangdong, China and had subsequently spread in another 26 countries [2, 3]. Understanding the clinical characteristics and effects of coronavirus on human health are very important to limit virus incidence and to plan an effective treatment [4]. Under electron microscope, coronavirus have crown like appearance due to presence of surface glycoproteins. Coronavirus are classified into four genera in which they are α-coronavirus, ß-coronavirus, Delta coronavirus and γ-coronavirus. The symptoms of coronavirus ranging from mild to severe and that are depend on the human body status and disease history. The common symptoms are including cough, fever, shortness of breath, fatigue, headache, body aches, loss of test and smell, nausea, vomiting, sore throat, diarrhea, confusion and many other symptoms [5]. Based on epidemiology and clinical evidences, coronavirus spread by transmission of the virus from person-to-person [6, 7]. It has been also reported that coronavirus spread via droplets, contaminated surfaces, and hands and the virus could be active on these environments up to 9 days [8]. Recent studies suggested the asymptomatic coronavirus infected people also could be an important way of the virus transmission [9, 10].

Since the outbreak is still ongoing and coronavirus continue to expend, epidemiological analysis of the infected patients is very necessary in order to understand the outbreak and also to facilitate the virus control managements. Up to date, most coronavirus studies focus on the center of the outbreak, the cities of Hubei province like Wuhan [1, 7, 11, 12]. However, fewer studies are conducted on coronavirus incidence and effect in other cities of different countries particularly, Iraq. Therefore, we assessed some blood parameters of coronavirus patients admitted in Al-Hilla teaching hospital in Babylon province, this study will help to get better idea on the pandemic and enable us to correlate the effect of the disease on people among different countries.

RESEARCH METHODS:

Study design:

This study included fifty five patients infected with coronavirus. Patients were diagnosed by real time PCR in Al-Hilla teaching hospital and they were chosen randomly for our study. All blood parameters included in our study were performed according to the guideline and research ethics.

Ferritin tests:

To determine the serum ferritin level in coronavirus infected patients, 100 µl of serum sample were taken and placed into strep of MINI VIDAS analytical device from bioMerieux (French) and the results were recorded after 1hour

Erythrocyte Sedimentation Rate (ESR) test:

A whole blood form Covid-19 patients were placed into Westergrn's tube and the results were recorded after 1hour.

C-Reactive Protein (CRP) test:

To determine the CRP of Covid-19 patients, 1 drop of serum sample and 1 drop from CRP latex solution were mixed together. If agglutination appears, then the CRP results were positive. When there is no agglutination appears then the CRP results were negative. CRP titer for positive results were determind by MINI VIDAS analytical device from bioMerieux (French).

Determination of ABO blood group:

Blood samples from fifty five patients were taken and one drop from each sample was mixed with an equal amount of ABO solution. When agglutination appears in A&Rh, the sample was diagnosed as A positive. If the agglutination appears in B&Rh, then sample was recorded as B positive. Moreover, if no agglutination in A&B but only in Rh then the sample was named as O positive. Finally, if no agglutination in Rh appears, samples were diagnosed as Rh negative.

Statistical analysis:

Statistical analysis of fifty five Covid-19 patients was performed using SPSS for Windows 9.3. Data were analyzed by Chi-squared test ($P < 0.05$).

RESULTS AND DISCUSSION:

In this study, we determined some blood parameters of fifty five patients infected with coronavirus. Our result showed that there was no significant correlation between the serum ferritin levels and coronavirus infection. The mean value of all infected patients exhibited normal range levels of serum ferritin (Table 1). In contrast to our study, it was reported that Covid-19 patients experience high level of serum ferritin and the severity of the infection were significantly related to serum ferritin level [13]. Another study also analyzed the ferritin level of 99 coronavirus patients and it was found that the serum ferritin level increased than the normal range in 63 of patients, while 36 of them had a normal range value of ferritin level. One possible explanation of our results is that severity of coronavirus was simple or mild severity in infected patients since the level of ferritin is related to the severity of the disease.

Furthermore, our results showed that there was a significant increase in the value of the erythrocyte sedimentation rate and C - reactive protein than the normal range in Covid-19 patients (Table 1). In agreement with our results, a study conducted on coronavirus patients admitted at the University of Alabama at Birmingham found that the level of (ESR) and (CRP) significantly increased in infected patients [14]. Henry et al, conducted a meta-analysis of 21 studies and showed that inflammatory biomarker, such as serum ferritin, ESR, CRP, IL-6, and IL-2R were significantly increased in a sever coronavirus patients [15]. It was also reported that biochemical markers (Creatinine, BUN, and CK), hematologic markers (WBC count, lymphocytecount, and platelet count), Hematologic markers (Neutrophil count, lymphocyte count, WBC count, and platelet count), and coagulation markers (PTT and D-dimer) were potentially correlated with coronavirus [16-18]. However, we observed elevated levels of ESR and CRP were associated with coronavirus infection. But we did not find any significant association between the serum ferritin level and coronavirus infection, which could be due to a limited sample size.

Table 1. Test value of blood parameters in fifty five patients infected with coronavirus

TEST	MEAN VALUE	NORMAL RANGE MEN / WOMEN
Ferritin	66.58167 (ng/ml)	24 -336 / 11 to 307 (ng/ml)
ESR	47.61111 (mm/hr)	0 - 22 / 0 - 29 (mm/hr)
CRP	38.11111(mg/l)	Less than 10 (mg/L)

Last but not the least, our result showed that coronavirus patients have all blood types indicated that coronavirus able to infects individuals of all blood group. However, patients with blood group A were more susceptible to infection than patients with other blood type indicating that individuals with A blood group are more susceptible to coronavirus infection (Table 2). It was reported that blood types have an important role in coronavirus infection and the

progression of the disease [19]. There is a possible link between the individuals' blood groups and the severity of coronavirus infection in multiple observational studies [20-22]. Similar to our result, it has been found that individuals with blood group A are more susceptible to coronavirus infections than other blood group [23].
In conclusion, our study showed that coronavirus patients associated with high levels of ESR and CRP and these inflammatory markers could be used as an important indicator to evaluate coronavirus infection. Also individuals with blood group A are at higher risk to get coronavirus infection. However, our results need to be further validated in a larger population scale.

Table 2. Blood group of Fifty five patients infected with coronavirus

BLOOD GROUP TYPE	N
A	28
O	13
B	8
AB	5

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