

Diagnosis Clinical Features In Patients Infected With Novel COVID-19 In Iraq.

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Abstracts: Novel corona virus COVID-19 suspected patients including 50 samples were collected from different hospitals in Baghdad, Iraq during 5th to 25th of March / 2020. Complete blood count including monocyte, hemoglobin, red blood cell, leukocyte, lymphocyte and platelets count, and serum C- reactive protein diagnosed in 20 patients which are positive to novel covid-19 in Iraq hospital. The result showed that the monocyte count average was $1.5 \times 10^3 / UL$, hemoglobin (Hb) count vary from 9 to 14 g/dl , the red blood cell average count was $4.83 \times 10^6 / UL$, leukocyte average was $16.00 \times 10^3 / UL$, the lymphocyte was 2.5 %, the platelet (PLT) average count was $512 \times 10^3 / UL$ and the C-reactive protein was 19 mg/L. The results showed that the total number of monocyte, hemoglobin (Hb) and red blood cell were slightly decrease or remained normal, while 90% of patients presented the number of leukocytes were highly increased and the percentage of lymphocytes were reduced, platelets count increased in 80 % and the serum CRP was slightly to high increased, except 10 % of patients slightly increase in leukocyte platelets, moderate change in the percentage of lymphocyte and 20% of serum CRP still normal. Blood parameter and serum C-Reactive protein can be an active evaluation index for infectious patients with novel COVID-19.

Key word: viral infection, corona virus, covid-19.

1. INTRODUCTION

Coronavirus is a big family of positive-sense, single-stranded RNA viruses that be a member of the Nidovirales order. The order comprises Roniviridae, Arteriviridae, and Coronaviridae families. The Coronaviridae family is divided into Torovirinae and Coronavirinae subfamilies (1). They were classified into 4 genera: Alpha coronaviruses (α), Beta coronaviruses (β), Gamma coronaviruses (γ), and Delta coronaviruses (δ) (2,3).

Coronaviruses (CoVs) was enveloped viruses with a single positive-stranded RNA genome (26–32 kb in length). They isolated from diverse animal species including livestock, birds, and mammals such as bats, camels, mice, masked palm civets, dogs, and cats (4). The widespread spreading and infection of Coronavirus mark it as significant pathogen.

The genome of virus encoded to four structural proteins (spike (S), envelope (E), nucleocapsid (N), and membrane (M)), multiple unique accessory proteins and non-structural proteins (2,3).

There were six coronaviruses recognized to infect humans, including four β -Covs (OC43, HKU1, severe acute respiratory syndrome (SARS-Cov), and Middle East respiratory syndrome (MERS-Cov) and two α -Covs (229E and NL63) (2,6).

All human corona viruses were zoonotic as a differentiating characteristic. Actually, bats are regarded as a key pool of coronaviruses, and many human coronaviruses are supposed to originate from bats (7,8).

Since the beginning of this century, two zoonotic coronaviruses, SARS-Cov and MERS-Cov, identified to reason severe human diseases (5,6,9). Since it was detection in Middle

Eastern countries in 2012, MERS-Cov was diseased 2,260 people with a current case fatality rate of 35.5%. These outbreaks have elevated public health concerns of the potential for the emergence of another novel zoonotic coronaviruses (10,11).

At the end of 2019, a series of pneumonia patients of unknown reason emerged in Wuhan (Hubei, China) (2). A few weeks later, in January 2020, sequencing analysis for samples of lower respiratory tract documented a novel virus severe acute respiratory syndrome coronavirus 2 (SARS-Cov-2) as causal agent for that detected pneumonia group(3). On February 11th, 2020, the World Health Organization (WHO) Director-General, Dr. Tedros Adhanom Ghebreyesus, named the disease produced by the SARS-CoV-2 as COVID-19. In March 11th, 2020 the number of countries involved was 114, with more than 118,000 cases and over 4000 deaths, the WHO acknowledged the pandemic status (5).

The frequent emergence and epidemics of coronaviruses show a public health threat. This suggests the possibility of animal to human and human to human transmission of coronaviruses newly emerging. The continuing variations in ecology and climate make future emergence of infections more possible (12).

Clinical features of COVID -19 establishes with a varied clinical spectrum going from asymptomatic patients to multiorgan dysfunction and septic shock . COVID-19 is classified based on the severity of the appearance (13). The illness classified into mild, moderate, severe, and critical. The record public symptoms of patients contain fever (98.6%), fatigue (69.6%), dry cough, and diarrhea (14).

2. METHOD

The clinical 50 patients with respiratory infectious symptoms examined with polymerase chain reaction test in Iraqi hospital for diagnosing if they have novel coronavirus COVID-19 in different hospital in Bagdad from period of 5th to 25th of March, 2020. After that from the patient with positive result to COVID-19 history data were collected, also a volume of 5 ml of peripheral blood from each one collected by vein puncture and divided into two tubes, 2 ml to EDTA tube and stored at -20 °C for complete blood picture by hematological test and 4 ml was transferred to a plain tube, subjected to centrifugation at 2000 rpm for 10 min, the serum was separated and stored at -20 °C for C-reactive protein as serological test.

3. RESULT AND DISCUSSION

Results:

Sample collection

Novel corona virus COVID-19 suspected patients including 50 samples were collected from different hospitals in Baghdad, Iraq during 5th to 25th of March / 2020. All of 50 samples were from Baghdad city , distributed as 30 from Al- Rasfa, 8 medicine city and 12 from Al-Karakh. All suspected cases have symptoms of fever , cough (some sever , other mild cough) ,some cases in addition to fever they have nasal congestion and fatigue. The 50 samples were subjected to Nucleic acid amplification tests (RT-PCR) as routine confirmation of cases of COVID-19 is based on detection of unique sequences of virus RNA.

The results of PCR showed that only 20 out of 50 samples were diagnosed with COVID-19 virus (confirmed COVID-19 patients), and the rest (30 patients) have mild other respiratory disease.

The 50 suspected patients of the novel corona virus COVID-19 divided three groups according to source of infection; first group was 5 from 12 suspected sample direct contact

from the same family one of them was traveling to a neighboring country infested with the disease. Second group including 9 from 32 suspected samples which all of them were recent travel history to the affected region. The third group was 6 from suspected samples which were intra-country infection that unknown the source it maybe from contact and shaking infectious person that still not diagnosed “presymptomatic period” or contact with non-symptomatic patients, also from the secretion or spray of infectious person causing contamination the markets, meaning of transportation, metal surfaces etc.

The mean age of 20 infectious patients with novel COVID-19 were 52 years, including 12 (60%), patients from the male and 8 (40%) patients from the females.

Blood and serum analysis

Complete blood count and serum C- reactive protein diagnosed in 20 patients which are positive to novel covid-19 in Iraq hospital, the result showed that the monocyte count average was 1.5×10^3 /UL (normal value $1.09-2.99 \times 10^3$ /UL), hemoglobin (Hb) count vary from 9 to 14 g/dl (normal value 11-14 g/L) , the red blood cell average count was 4.83×10^6 /UL normal value ($4.00-5.50 \times 10^6$ /UL) .

In contrast, table (1) present that leukocyte average was 16.00×10^3 /UL (normal value $3.70-11 \times 10^3$ /UL), the lymphocyte was 2.5 % (normal value 16.5-45 %), the platelet (PLT) average count was 512×10^3 /UL (normal value $155-450 \times 10^3$ /UL) and the C reactive protein was 19 mg/L.

So that, the results showed the total number of monocyte, hemoglobin (Hb)and red blood cell were slightly decrease or remained normal.

On the other hand, As in table (1) sample from 1to 18, 90% of patients were showed the number of leukocytes were highly increased and the percentage of lymphocytes were reduced, platelets count increased in 80 % and the serum CRP was slightly to high increased, except 10 % (sample 19 and 20) of patients slightly increase in leukocyte platelets, moderate change in the percentage of lymphocyte and serum CRP still normal.

Table (1) the leukocyte count and percentage of lymphocyte of 20 patients with COVID-19 infection in deferent hospital in hospital

| Patient | Age | Sex | WBC(leukocyte) 10 ³ /ul N.V 3.70-11 10 ³ /ul | Lymphocyte Percentage N.V. 45-16.6 L% | platelet count 10 ³ /UL N.V. 155-450 10 ³ /UL | C- Reactive protein Mg/L |
|---------|-----|--------|---|--|--|-----------------------------------|
| Cv1 | 60 | Mail | 16.5 | 2.8 | 720H | 13 |
| Cv2 | 58 | Mail | 14.3 | 1.4 | 648H | 18 |
| Cv3 | 58 | Mail | 15.5 | 3 | 550H | 14 |
| Cv4 | 57 | Female | 15.6 | 1.2 | 589H | Non |
| Cv5 | 57 | Female | 16.00 | 3.8 | 669H | Non |
| Cv6 | 55 | Mail | 17.2 | 1.6 | 558H | 15 |
| Cv7 | 55 | Mail | 16.7 | 3.5 | 556H | 20 |
| Cv8 | 53 | Mail | 15.4 | 4.8 | 670H | 18 |
| Cv9 | 53 | Female | 15.7 | 2.8 | 680H | 23 |
| Cv10 | 53 | Female | 17.2 | 1.5 | 582H | Non |
| Cv11 | 52 | Mail | 17.5 | 5.6 | 693H | Non |
| Cv12 | 52 | Mail | 16.7 | 1.7 | 629H | 18 |
| Cv13 | 50 | Female | 15.7 | 2.7 | 553H | 23 |
| Cv14 | 50 | Mail | 15.9 | 3.2 | 553H | 18 |
| Cv15 | 49 | Female | 17.6 | 4.7 | 640H | Non |
| Cv16 | 47 | Female | 15.5 | 1.7 | 340H | Non |
| Cv17 | 45 | Mail | 16.00 | 2.00 | 436H | Non |
| Cv18 | 42 | Mail | 16.5 | 2.3 | 550H | 9 |
| Cv19 | 39 | Female | 12.5 | 38.5 | 260H | 5 |
| Cv20 | 38 | Female | 11.9 | 40.00 | 200H | 3.8 |

4. DISCUSSION:

From the collected data of the patients it is clear that , there were two groups first one the symptoms were seen in people who were traveling outside the country or after some days to two weeks after returning from travel outside the country. The second group included people who were infected after the first case that diagnosed inside Iraq (1-3 week) that result from the contaminating of markets, transportation means, metal surface etc, by infectious persons that still undiagnosed. This indeed agree with study in Wuhan city in China when they found that there is a period of 2–3 weeks between a person developing symptoms, gradual development of respiratory problems, with fever being the most typical, also cough was not usually dry and was often accompanied by white phlegm. The other symptoms of upper respiratory tract infection (such as sneezing, runny nose, were not common the case subsequently being detected and reported, and observation of the final clinical outcome were recorded (15,16) .

Another clinical study of other hospitalized patients have shown that, there are incubation period (1-14 days) for COVID-19, patients show no symptoms before the onset of the illness after this period they frequently show symptoms associated with viral pneumonia, most commonly fever, cough, sore throat, myalgia, and fatigue (17,18.19).

As related to the relation of the COVID-19 infection with the age, in Iraq the mean age was 52 years, It is clear that infection ratio increases substantially with age , so the ratio increased in older patients. There is a low infectious ratio in those under the age of 30th years. As there are very few cases in this age group, it remains unclear whether this reflects a low risk of infection or a difference in susceptibility.

In addition, many studies found younger people are at risk of infection and the fatality rate is high if they could have chronic diseases, including cardiovascular and cerebrovascular diseases, endocrine system disease, digestive system disease, respiratory system disease, malignant tumour, and nervous system disease. It was observed that it may be another disease like pneumonia and H1N1 influenza or SARS, but it needs more tools for detection (19, 20, 21).

Also as related to gender of patients it is noticed that most patients were from the male 12 (60%) and 8 (40%) patients from the females.

It is clear that there are factors that participate in infection specificity to human gender (infection in males more than in females), this agrees with the study in China that demonstrates the reduced susceptibility of females to viral infections could be attributed to the protection from X chromosome and sex hormones, which play an important role in innate and adaptive immunity (21). Another study that showed a greater number of men than women in the 99 cases of 2019-nCoV infection. MERS-CoV and SARS-CoV have also been found to infect more males than females (21,22).

The percentage of three groups of confirmed patients with the novel coronavirus COVID-19 which divided according to source of infection; first group was 25% (direct contact), 45% (travelling) and 30% (infected from contact with presymptomatic or symptomatic patients and contamination). This ratio appeared in a period between 5th to 25th of March 2020 in Iraq which the highest group from the travelling people that transport the virus to our country, nowadays the ratio completely different because it increased by contact and contamination. Also in this study none of the patients were medical staff.

This is in line with studies in China that show most of infections of infected patients happened when contact with other patients who do not appear symptoms (pre-symptomatic patients) or by contact with contaminated things (14). Furthermore, another study in Wuhan, China indicated that 99 patients with COVID-19 had (49%) patients clustered and had an exposure history to the market of seafood, also there were 47% of patients with history of long-term exposure including market managers or salesmen, and 2% of patients had history of short-term exposure, who were shoppers (23).

with data from published epidemiology and virology studies provide evidence that COVID-19 is primarily transmitted from symptomatic people to others who are in close contact through respiratory droplets, by direct contact with infected persons, or by contact with contaminated objects and surfaces (11,12).

Also as some patients catch the virus from a symptomatic patient, this agrees with some reports and studies, therefore, transmission from a pre-symptomatic case can occur before symptom onset (13,14).

From the result above, Iraqi patients showed increasing in leukocyte level. Leukocytosis (increase leukocyte count) was very corporate in patients. That happens in reaction to a wide variability of conditions including viral for lung diseases such as pneumonia, and used as a very important marker for diagnosis of disease (28).

In the study in China, they establish that the patients had an increased level of WBCs (leukocytosis) above normal levels of immature (29). Furthermore in another study found the rate of WBC counts in severe patients with COVID-19 were increased significantly and lymphocytes percentage of whole patients were diminished (30).

Also in this study, Most lymphocytes percentage results presented highly decreased, this Lymphopenia result considered as a predictor of prognosis in novel COVID-19 patients.

Most cases showed that LYM% was reduced to lower than 5% within 2 weeks after disease onset, it became critically ill with high mortality rate and need intensive care (31). Furthermore, The levels of serum CRP evidently increased in very severe cases and decrease

in lymphocytes %. Increased CRP might associate to secondary infection of bacteria and related with lowly clinical prognosis (32).

As we acknowledged, once inflammation or tissue harm occurs, serum CRP could significantly upturn, that was usually considered as an exclusive inflammatory marker in the present clinical training (33). Reliably, our study showed that serum CRP, LYM% and Leukocyte are obviously increased in severe and very severe novel COVID-19 in Iraq, lead to may be correlates of having viral infection and secondary bacterial infection, and that in line with study in china included higher levels of serum CRP, associated with severe SARS COVID-19 could be connected to secondary infection of bacteria, protection from which may decreasing the mortality rate (33).

Indeed, SARS COVID-19 in Wuhan could mostly act on percentage of lymphocytes (especially T lymphocytes). The low rat of lymphocytes important as reference index in the diagnosis of novel corona-virus infections, virus elements spread through the mucosa of respiratory track and infects other cells, stimulating a cytokine tempest in the body, produce a sequence of immune responses that cause changing in peripheral white blood cells and immune cells like lymphocytes. Consequently, early identification and suitable treatment of critical patients is of essential importance. Also, the decreasing in the whole number of lymphocytes point to virus of corona devours many immune cells lead to inhibiting in the body's cellular immune occupation (34,35)

Lymphocytes have important role in keeping immune homeostasis and inflammatory response during the body. Understanding the reducing mechanism for blood lymphocyte levels is predictable to offer an actual strategy for the treatment of COVID-19. The virus could directly infected lymphocytes, leading to lymphocyte death. Lymphocytes express ACE2 which is coronavirus receptor and can be a viruses direct target. In conclusion (36).

Noticeable that platelets count increased in this study in 80% of patients with novel COVID-19. Scientist in earlier studies have found that the platelets were a nucleate blood cells having a crucial role in the hemostasis maintenance. However, when platelet activation and raised platelet counts the increasing risk of thrombotic complications. Viral infections frequently accord with platelet activation, so platelets and their released yields describe the directly and indirectly suppress infection or maintenance virus resolution, it is important to know platelets production have a double-edged sword through viral infections. the viral influence platelet activation, and platelet-mediated modulations of innate and adaptive immune responses, Thrombocytopenia is a public problem in several viral infections, so viruses use numerous strategies to mediate platelet decline (37).

In China there is study with 1779 novel COVID-19 cases, designated that thrombocytopenia (low platelet count) was related with risk of severe disease and mortality in patients therefore it attended as clinical pointer of worsening disease during hospitalization (38).

On the other hand, platelet activation in reaction to direct and indirect contact with viruses lead to platelet activation and degranulation (39). Another study also found that the direct interaction between platelets and viruses has been observed in various viral infections, the interactions important to platelet activation do not only effect in enriched platelet permission, the elimination of virus-laden platelets also donates to the clearance particles of virus, To date, it remains unclear if platelet-virus interactions are beneficial for the host or for the virus (40).

In Iraqi patients with novel COVID-19 was showed increasing platelet count , there is no research clarify the role of increasing platelets count with novel covide-19 beaver, it may be have benefit role or be lethal by thrombosis, it need more clinical laboratory analysis of samples and history of patients if have another diseases related to thrombosis or not also follow-up the patients if caused clots or not .

One essential limitation in the current study is that, we have only detected infection biomarkers with limiting SARS COVID-19 cases. Secondly, the current study hasn't assessed the association between makers of infection and prognosis of all the patients registered. So needing for more clinical information attained from COVID-19 patients, additional big population-based potential studies might afford further indication how infection biomarkers are changed and what it specify in SARS COVID-19.

Also it is remarkably know that 18 patient from all (20 patients) were healing and unfortunately two patients were died.

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