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Estimate of Immunoglobulin G, M, and Some Liver Enzymes Levels in Covid-19 Patients and Relation with Blood Group in Najaf Governorate, Iraq.

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Abstract. The COVID19 disease is a transmittable viral infection that causes acute respiratory system infection, to this day there is no proven treatment for this virus and its complication in the body are still unclear. so the current study aimed to determine the levels of immunoglobulin (M, G) against infection with covid 19, the measure of liver enzymes(AST, ALT), and the relation of infection with blood group. This study included 60 patients infected by COVID-19 and 30 uninfected people, who came to the AL-Najaf Hospitals from January to March month 2020. Draw 5 ml of blood for the measure of G, M, and AST, ALT levels, and determine the blood group. The results showed that infection with the Covid-19 virus had a significant effect ($p < 0.001$) on the level of both G and M antibodies compared to the control group (10.18, 16.94) mg/dl, (0.320,0.312) mg/dl, respectively. also, the study showed the significant effect of infection on liver enzymes which caused increased AST and ALT levels (44.25,52.30)U/L compared with the control group (36.28, 42.46) U/L respectively .also explained the relation between blood group and covid 19 infection, as a blood group A recorded the highest rate of infection and blood type O lowest rate of infection (35, 13.33) % respectively. so it is possible to rely on measuring the level of G, M antibodies in diagnosing or recovering from covid 19 infection .also, know the effect of the infection on the liver and the relationship between infection and blood group.

Keywords. Immunoglobulin, COVID-19, liver Enzyme, blood group, Najaf.

INTRODUCTION

To understand the epidemiology and risks of the covid 19 virus, we need the serological test, which confirms the presence of antibodies in the blood that represents evidence of infection with the Coronavirus. Relying on surveys among populations in different countries of the world enables understanding of the spread of the Coronavirus and thus helps decision-makers to confront the epidemic collectively.(1)

In December 2019, China announced an outbreak of idiopathic pneumonia (Rio and Althaus), and confirmed that it was Covid 19. This infection spread very quickly and caused havoc beyond previous strains as it spread to more than 200 countries in the world, as the infection spread to more than from 200 countries in the world. The impact was described by the World Health Organization as severe in 2020. First outbreak of infection from a large market in Wuhan that sells marine fish and animals. (2)

The Covid-19 virus is a member of the beta coronavirus group, which is an RNA-coated virus (2), which has the ability to cause acute respiratory infection and may cause death. It was found that bats are the natural reservoir and source of the Covid-19 virus, according to the evidence of evolutionary analysis and genome sequencing, which can transmit the virus to humans through unknown intermediate hosts. As well as the possibility of transmission of the virus from one person to another through droplets or direct contact(3, 4, 5). It was also recently found that pangolins represent an intermediate host for transmission of infection (GUO et al, 2020). It was also found that 41% of people acquired the infection through hospitals, according to what was recorded by one of the studies (6), and travel also contributed to the spread of the Covid 19 virus around the world (7), and by relying on the rapid increase in infection and its ability to transmit without the appearance of symptoms, Covid 19 can cause human infection and the possibility of a pandemic (8, 9, 10).

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Symptoms of infection with Covid 19 appear during the incubation period, that is, two days to two weeks after infection with the virus, which includes loss of taste and smell, fever, fatigue, cough, and difficulty breathing. The immune response is also stimulated, causing the production of antibodies(IgM) to COVID-19 after 5 days from infection, followed by IgG after10 days from infection, which can be determined by serological tests (11,12). Immunoglobulins are an essential component of the immune response (13), and represent to be one of the important factors of inflammation (14). Many studies confirmed the role of immunoglobulin in the resistance of diseases including covid 19 disease. (15).

COVID 19 can cause dysfunction in some organs, including the liver in addition to the respiratory system infected, causing the appearance of pathological symptoms, the occurrence of defects in the liver's enzymatic functions, especially in the level of aspartate aminotransferase(AST), and alanine aminotransferase(ALT), which was confirmed by previous studies. (16,17,18,19)

The current study aimed to estimate the level of immune antibodies in the body of a person infected with COVID-19 virus that help diagnose the infection and recovery ,also determine effect of infection on AST and ALT levels and a relationship between the type of blood type and infection with the virus Covid-19.

METHODS AND MATERIALS

Sample Collection

Blood samples have collected from infected people with COVID-19 only , after clinical examination and laboratory diagnosis and Exclusion any patient infected with other respiratory system infection in AL Najaf Governorate . draw (5ml) blood from vein and first part put in the test tube, then isolated serum by used centrifugation at 3500 rpm for 10 min for measure level of IgG , IgM, AST and ALT Levels .second part put in EDTA tube and used directly for diagnosis type of blood group**.**

Measurement of Immunoglobulin G and M

The level of G and M antibody was measured using the VIDAS technique and kit manufactured by the company(bio Merieux, France) .

Measurement of AST and ALT

the level of liver enzymes (AST and ALT) was measured using the Fujifilm device of Japanese origin

Determent of Blood Group

blood group diagnostic by used specific kit by Biorex diagnostic Limited (United Kingdom,2016)with used microplate test and slide is based on agglutination reaction between antibodies (Anti –A, Anti-B, and anti-D) and Red blood cells.

STATISTICAL ANALYSIS

The data are analyzed using by SPSS statistical program version 18 software, the categorical changeable was given as percentage and frequencies

RESULTS

The current study showed that infection with Covid-19 virus has a significant effect M and G antibodies levels (10.18 ,16.94) mg/dl in infected people compared with the control group (0.320, 0.312)) Respectively(figure 1)

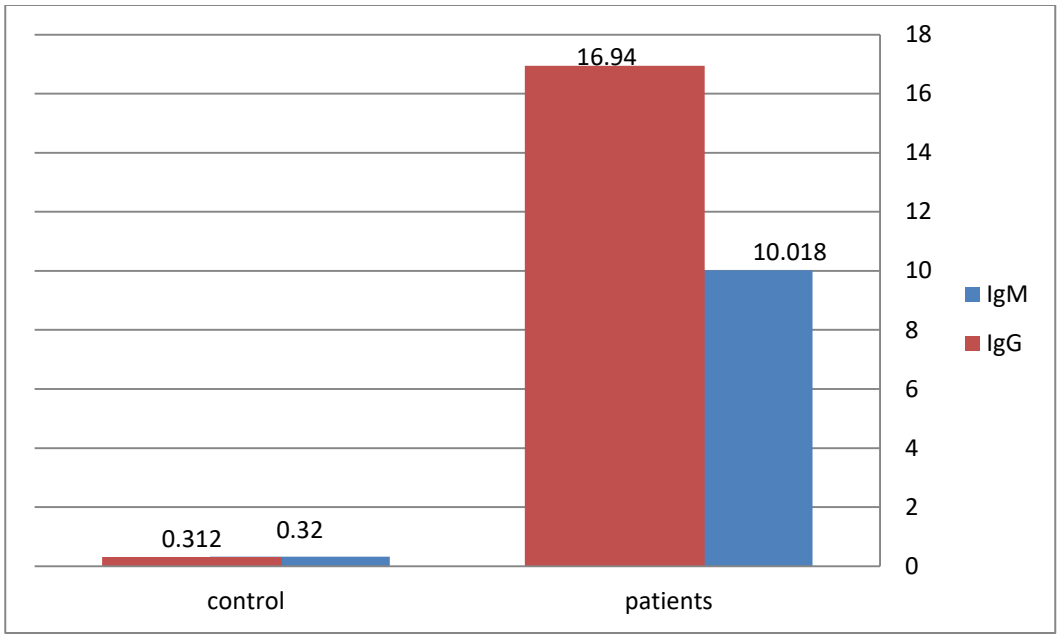

FIGURE 1. Showed the relation between M and G levels in patients compared with the uninfected people .

The results explained that infection with Covid-19 virus has a significant effect on liver enzymes levels AST and ALT(44.25, 52.3) U/L in infected people compared with the control group (36.28 , 42.46)U/L Respectively(figure 2)

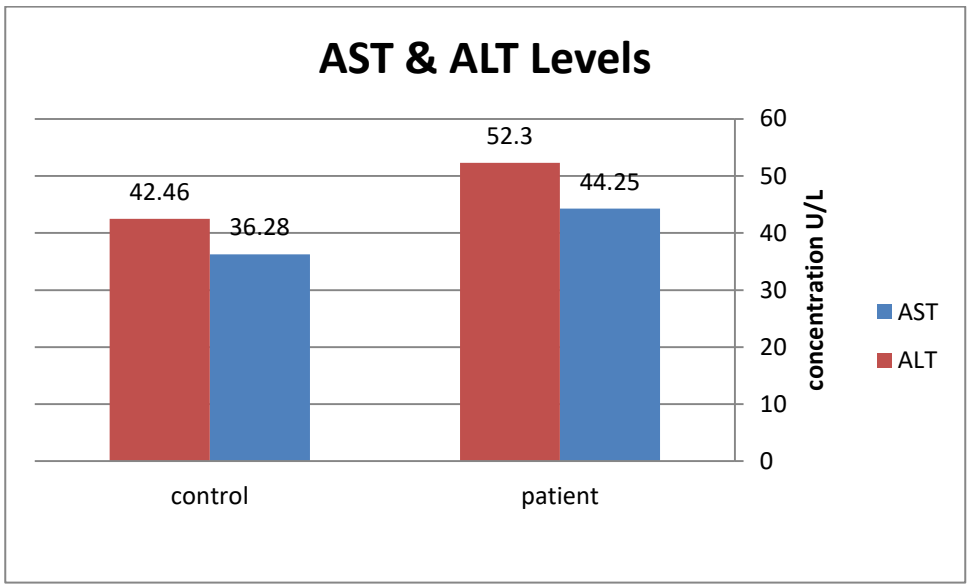

FIGURE 2. Showed AST and ALT levels in COVID-19 patients compared to the control group

Also, the results proved the relation betweenCovid-19 infection and blood group , as blood type A recorded the highest infection rate (35%) 21/60 and group O lowest rate of infection (13.33)%8/60 respectively. (Figure 3).

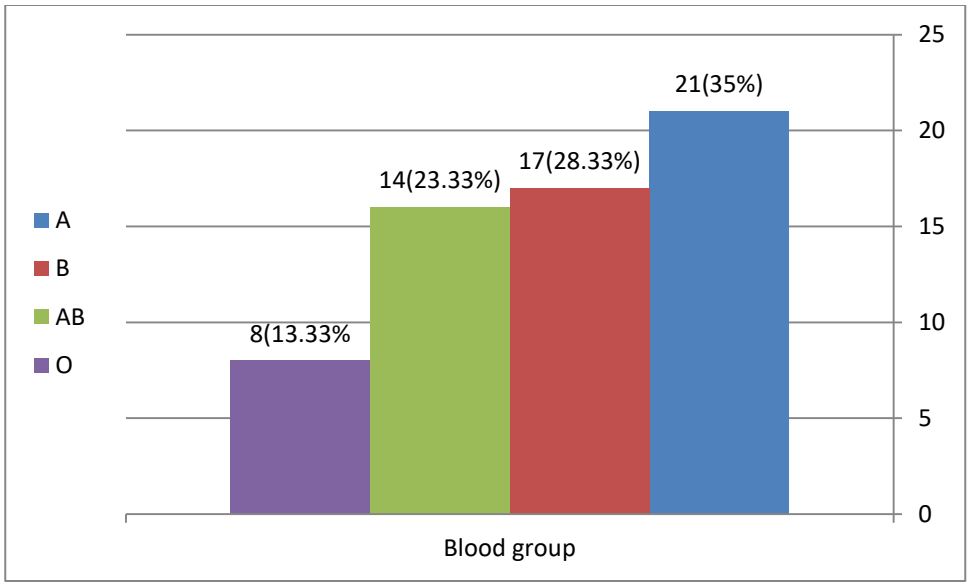

FIGURE 3. Showed the relation between blood group and the rate of infection with COVID-19.

DISCUSSION

Human Coronaviruses are considered one of the viruses known for several years, but the Covid-19 virus is a new strain that has spread greatly and quickly all over the world and the reason for the spread of fear among people due to the lack of immunity to this virus, as the majority of people, are vulnerable to infection. It was noted through the results that infection with the Covid-19 causes a serological response similar to what happens in the serological diagnosis of the SARS epidemic by determining the M and G antibodies , where the level of both M and G antibodies was higher in people infected with Covid 19 compared to the Control group, which reflects the role of the immune system and the body's immune response against infection, as M antibodies are detected in the blood early in the infection (3-7) days because it represents the first line of defense for humoral immunity in the body, followed by the response of G antibodies, which plays role in immune memory Long-term Previous studies have found that M antibodies reach their peak in the period (14-21) days after infection, after which their level begins to decline and at the same time there is a rapid increase in the level of G antibodies, which maintains the high level for two months, so it can be Detection of M and G antibodies is an indication of the presence of the disease, while the presence of IgG and loss of IgM indicates exposure to the virus beforehand.(20,21)

It is known that the entry of the Covid-19 virus to the human body is through the angiotensin II enzyme receptors, which appears in the respiratory system by 2.6% in hepatocytes and 59.7% in the epithelial cells of the bile duct, which allows the virus to infect these cells and thus disrupt the functions of Liver(17), Studies conducted in this field have confirmed that severe cases of Covid-19 cause increase in liver function, but due to the lack of these studies, scientists have not been able to determine whether these complications are resulted from the disease itself or as a result of other factors due to the body's reaction or complications of medications. Therapeutic used for its role in getting rid of toxins resulting from drug abuse(18,19). This study showed an increase in liver enzymes in the majority of patients who suffer from severe symptoms of Covid 19, especially after the first week of the disease symptoms appeared. Some previous studies recorded that infection with Covid 19 has a mild and insignificant effect on liver function, but this effect appears after 7 days from the onset of symptoms, since liver function tests are tests conducted for the purpose of knowing the severity of the infection, especially in severely infected patients when they enter the hospital(19)also previous Studies have shown that infection with Covid 19 can cause liver damage, especially in the elderly(13,22)

The current study showed a relationship between infection with Covid 19 and blood group. where the highest infection rate was recorded in the blood group A(35%), while the lowest infection rate was in the blood group O(13.33%). these results agreement with the findings of the study (23) ,which was conducted in Bangladesh in September 2020,which proved the close relationship between blood group and infection with covid 19, which confirmed that blood group A is closely related to the severity of infection and the risk of death resulted from infection ,while blood group O less dangerous . despite the existence of many studies not find relationship between blood groups and infection and its severity, despite the role of blood group in the pathophysiology of the virus.(24,25,26,27,28,29,30)

CONCLUSION

We conclude from this study that infection with the Covid-19 virus has a great effect on the M and G antibodies levels, so it is possible to depend on these antibodies in diagnosing or recovering from infection. also, identify the effect of the infection on the liver and the relationship between infection and blood group.

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