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Effect of intestinal parasites infection on clinical features of patients infected with COVID-19 in Al-Diwaniyah governorate

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Abstract---The study included a survey of intestinal parasites of patients infected with the emerging coronavirus, COVID-19 in Al-Diwaniyah Governorate, from October 2021 to June 2022, aimed to study the effect of concomitant parasitic infections on the severity of infection with the emerging coronavirus (Covid-19), by examining 211 patients with severe acute respiratory syndrome (SARS-COVID-19), their infection was confirmed by Real time PCR method in the laboratories of Al-Diwaniyah Teaching Hospital. The results show that the severity of COVID-19 was determined based on clinical symptoms and co-parasitic infection, these symptoms are represented by a cough, fever, loss of taste and smell, shortness of breath, diarrhea, diastolic and systolic blood pressure, lack of oxygen, heart rate, and a high temperature of more than 37° C. The immunoglobulins showed that 7 and 8 cases positive for IgM & IgG were recorded, respectively, while 3 cases were negative for IgM and 4 cases were also negative for IgG, as for patients suffering from parasitic infection in addition to covid 19, 6 positive cases for both IgM & IgG and 4 negative cases for both IgM & IgG were recorded.

Keywords---protozoa, helminthes, clinical feature, COVID-19.

Introduction

The effects of the spread of the Corona virus globally, seems a national and international inability to confront it, a lot of questions and concerns about the efficiency of countries, the feasibility of the international globalization system[1]. National health systems stood in a cohesive, rich and scientifically developed country Unable to fight this virus, to the point of collapse of some of these

systems, while the role of the modern international cooperation system has almost disappeared, by the institutions and organizations of the United Nations, it has become very questionable, as was the case of the World Health Organization[2].It was likely that intestinal parasites were known, especially worms to prehistoric times, Ascaris worms have been diagnosed since 1122 BC in Peru, these worms were also known in Brazil in the period between 2660-2430 BC, it was recorded in Egypt during the period between 2938-2600 BC[3]. Intestinal parasites cause many diseases in humans, sometimes it leads to the death of a person, led to the study and knowledge of intestinal parasites from ages to the present[4]. Perhaps the population density is one of the most important reasons that led to the spread of intestinal parasites[5].

The development and complexity of life, the reason for the increase and spread of parasites, as the existence of means of transportation and migration from one country to another and the expansion of trade and the exchange of goods between different countries, helped in the spread and transmission of parasites in many countries[6]. Intestinal parasite infection is one of the most common and widespread infections in humans, as it spreads in all countries of the world, especially in developing and poor countries[7]. The current study aims to determine the effect of protozoa parasites on the clinical characteristics of COVID-19 patients in Al-Qadisiyah Governorate.

Materials and Methods

The study included a survey of intestinal parasites of patients infected with Coronavirus (COVID-19) at Al-Diwaniyah Teaching Hospital, they were examined for intestinal parasites, from October 2021 to June 2022. The preliminary result showed that the number of people infected with the pandemic was 211, their ages ranged from less than 15 years to more than 50 years for both sexes and from different regions of Al-Diwaniyah Governorate, to study the possible direct or indirect effects of concomitant parasitic infection on clinical features of COVID-19 patients, determining the severity of the pandemic and then determining the factors associated with the development of the disease by recording the disease symptoms. The study included the collection of 211 blood samples from COVID-19 patients in search of parasites due to their presence in the blood, 3 ml from each patient to measure IgM and IgG antibodies in the blood serum. The data were analyzed and the significant differences in the study groups were compared, by chi-square (X^2), according to the ready-made statistical program SPSS. at the level of significant probability 0.05.

Results and Discussions

Clinical symptoms of COVID-19 patients

The severity of COVID-19 was determined based on clinical symptoms and co-infection with the parasite, were represented by cough, fever, loss of taste and smell, shortness of breath, diarrhea, diastolic and systolic blood pressure, lack of oxygen, heart rate, and fever more than 37°C, these clinical symptoms recorded different rates of infection among Covid-19 patients, there was a variance in these

ratios (Table 1), where the table shows the significant differences with statistical significance.

Table 1
Clinical symptoms of COVID-19 patients with or without parasitic infection

Clinical symptoms	COVID-19 patients		Mean N.(211)
	Without parasites N.(151)	With parasites N.(60)	
Fever	151	47	198 (93.80)
Cough	148	27	175 (82.90)
Shortness of breath	118	6	124 (58.76)
Loss of taste and smell	125	12	137 (64.92)
Diarrhea	120	38	158 (74.88)
Diastolic blood pressure	44	1	45 (21.32)
Systolic blood pressure	113	2	115 (54.50)
Heart rate	83	0	83 (39.33)
Lack of oxygen	64	0	64 (30.33)
Fever more than 37 ° C	91	0	91 (43.12)
Statistical analysis	P. Value 0.000		

These clinical symptoms were recorded as common symptoms for all COVID-19 patients, according to the World Health Organization (WHO), where the study noted, there was a discrepancy in clinical symptoms in infected person, there were clinical symptoms that appear in patients without other patients, symptoms include fever, cough, loss of taste and diarrhea, symptoms that may be common in the two groups (people infected with Covid-19 with a parasitic infection and people with Covid-19 without a parasitic infection), as for the clinical symptoms, such as lack of oxygen, pressure disturbance (diastolic and systolic), irregular heartbeat, and high temperature of more than 37°C, these clinical symptoms were especially in patients infected with covid19 only.

Boonyarangka *et al.*[8] showed that people with a history of malaria and a pandemic had a mild course of clinical symptoms without any pulmonary complications or oxygen demand. As for Gebrecherkos *et al.*[9], it was confirmed during his study that Covid patients who suffer from parasitic infection have mild / moderate clinical symptoms at the time of diagnosis, as for patients suffering from covid 19 only, their clinical symptoms were severe, and they were often required to be admitted to intensive care .While Geng and Wang[10] also stated that COVID-19 causes many symptoms such as fever, cough and fatigue, and the clinical spectrum of COVID-19 pneumonia ranges from mild to severe, added that 80% of the infected people do not show symptoms or show mild symptoms in the upper respiratory tract, others have severe clinical symptoms such as shortness of breath, hypoxia, acute respiratory distress syndrome, shock, and even death.

Effect of co-parasitic infection on immunoglobulins in covid-19 patients

When studying the symptoms of parasitic infection in patients with covid 19, immunoglobulins should be studied, for the purpose of the study, we took blood samples for 10 patients with COVID-19 with co-infection and 10 patients with COVID-19 only. The results were 7 and 8 positive cases for IgM and IgG, respectively, while 3 cases were recorded negative for IgM and 4 cases negative for IgG, we did not find significant statistically significant differences (Table 2).

Table 2
Immunoglobulins in COVID-19 patients without parasites infection

COVID-19 patients without parasites infection				
Gender	IgM+	IgM-	IgG+	IgG-
Male	4	2	5	1
Female	3	1	1	3
Total	7	3	6	4
X^2	P. Value 0.197			

As for patients who suffer from parasitic infection in addition to covid 19, six positive cases for both IgM & IgG and (4) negative cases for both IgM & IgG were recorded, no significant statistically significant differences were observed (Table 3).

Table 3
Immunoglobulins in COVID-19 patients with parasites infection

COVID-19 patients with parasites infection				
Gender	IgM+	IgM-	IgG+	IgG-
Male	2	3	5	3
Female	4	1	1	1
Total	6	4	6	4
X^2	P. Value 0.149			

When studying clinical symptoms in Covid patients and comparing them with patients with common parasitic infection, the antibody rat test should be observed to measure the binding of antibodies (immunoglobulin Ig), it was one of the rapid diagnostic tests used to diagnose Covid patients before they are diagnosed by the PCR unit, where body composition is associated with high levels of immunoglobulins, when the body was exposed to one of the microorganisms, including COVID-19, in common parasitic infection, IgG and IgM antibodies were formed. Where a high proportion of these bodies was observed, whether in Covid patients or patients with common parasitic infections, there were no statistically significant differences. This rise in antibodies is caused not only by COVID-19 pneumonia, but also associated with various infections and co-infections[11] normally, levels of IgM and IgG3 antibodies are increased, produced by the immune system to fight infection, when a person is infected with the emerging corona virus, but researchers in Zurich discovered that the levels of these bodies are low in Covid patients, who still report symptoms after four weeks, especially

when the victim is in the at-risk category, because of age or asthma, for example, this discovery has prompted doctors to link the development of the so-called acute Covid-19 syndrome to the presence of distinctive fingerprints of antibodies[12]. A number of researchers indicated that the immunoglobulins were elevated in case of parasite infection (Hamid and Al-Waaly[13], Al-Gharibawi and Al-Waaly[14], Alnaimy and Al-Waaly[15], Al-Waaly et al.[16]).

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