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Clinical Features of COVID-19 Patients in Thi-Qar Province

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***Abstract*—Coronavirus disease–2019 (COVID-19) was detected in Wuhan, China, in December 2019, resulting in a 2% fatality rate. Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) is the virus that causes this illness, and it is a newly discovered zoonotic strain.TLRs, which identify microbial components originating from invading pathogens, are implicated in the activation of innate responses to SARS-CoV-2 infection as well as the hyperinflammatory phenotype of COVID-19. Aim: Determining the most common clinical factors in people with Covid and adopting them as the initial clinical diagnosis. To reduce the risk of disease.**

Results: The highest age group of patients with covid_19 was (45-54 years) were 26 (29.5%) of all study patients. The most frequent symptom was fever (82.9%), and the least was diarrhea (21.6%). The study found no significant positive effect on smoking and non-smokers.

***Keywords*—Component, Formatting, Style, Styling.**

I. INTRODUCTION

Coronavirus disease 19, commonly called COVID-19, is caused by a recently identified beta coronavirus classified as severe acute respiratory syndrome coronavirus 2. (SARS-CoV-2).This virus only contains a single strand of RNA [1]. After the first incidence was detected in December 2019 in Wuhan, China, COVID-19 has swiftly spread over the globe and become a pandemic, with over 563 million individuals infected and over 5 million fatalities in over 200 nations.[1]. Since the beginning of the century, the COVID-19 outbreak has been the third CoV outbreak. [2]. The first pandemic, which started in China in November 2002 and concluded in July 2003, was caused by SARS-CoV, resulting in 8,422 cases reported and 772 mortality in 26 countries. [3]. The second one appeared in Saudi Arabia in June 2012 and was caused by a novel subtype of the Middle East respiratory syndrome coronavirus (MERS-CoV) [4].The MERS-CoV epidemic continues, with 2,499 cases and 858 deaths reported in 27 countries as of December 2019[2].The molecular structure of SARS-CoV-2 has four key proteins: the spike (S), envelope (E), membrane (M), and nucleocapsid (N). SARS-CoV-2 shares approximately 80% of its genetic sequence with SARS-CoV, the virus causative for the pandemic of SARS in 2002. [5]. Although their similarities, the Severe acute respiratory S protein, which enables the virus to connect to the ACE2 receptor, is many amino acids lengthier than the SARS-CoV S protein.This may be why COVID-19 has expanded so rapidly over the globe, in contrast to SARS, which was immediately restricted to its original location.. [6]. Human angiotensin-converting enzyme 2 (ACE2) is a type I membrane protein that binds viral S proteins. SARS-CoV-2 binds to ACE2 10 to 20-fold more strongly than SARSCoV, which may explainthe reason human-to-human transfer is simpler.[7]. The clinical presentation of SARS-CoV-2 infection might vary greatly from patient to patient. [8], Approximately 80% of patients had a moderate illness, 14% had significant signs or symptoms, such as shortness, hypoxia, or lung infiltrates encompassing more than fifty percent of the parenchyma of the affected lung(s), and 5% had indications suggestive of severe illness, including shocks, respiratory failure, or multiple organ failure. Notably, the total mortality rate for the group was 2.3%.[9] . Fever, a dry cough, and exhaustion are often the symptoms experienced by most people in the early stages of a COVID-19 infection. [10]. Less common symptoms include nausea or vomiting, muscular or joint pain, dry mouth, lack of odour, rhinitis, conjunctivitis, headaches, different skin rashes, diarrhea, chills, and disorientation. [11]. In the advanced stages of the illness, the patients will have severe difficulty breathing, decreased blood oxygen (hypoxia), lung damage, and various organ failure. [12]. Other consequences of COVID-19 sickness include more extreme and uncommon neurological symptoms such as stroke, encephalitis, insanity, and nerve damage. [13].Transmission can occur by coughing, sneezing, inhaling droplets, and direct contact with the mouth, nose, and eyes. [5]. from Human-to-human occurs through common ways such as contact, direct, and airborne transmission[14].The viral life cycle and replication begin with viral integration onto ACE2 receptors in mucosal, pulmonary, cardiac, and renal epithelia. Age-related ACE2 expression increases adult ACE2 receptors [15]. Antigen-presenting cells (APCs), including dendritic cells and macrophages, can take in the virus and then pass it to T cells for processing.APCs are responsible for the induction and differentiation of T cells, as well as the following massive release of cytokines once these processes have taken place. [16]. The host's innate immune system utilizes pattern recognition receptors (PRRs), such as toll-like

receptors(TLRs), to identify viral components. The production of inflammatory factors that can mediate lung inflammation and fibrosis is stimulated by TLR binding [17].The ten members of the TLRs family (TLR1–TLR10) are expressed on macrophages, epithelial cells, and fibroblast cells. Multiple pathogen-associated molecular patterns (PAMPs) from bacteria, viruses, and other foreign pathogens may activate TLR [18].TLRs initiate innate immune activity by producing inflammatory cytokines, IFN, and other mediators.TLR 1, 2, 4,5, 6, and 10 are cell surface receptors; TLR 3, 7, 8, and 9 are endosome receptors.. [19]. Dendritic cells (DCs), macrophages, natural killer cells, adaptive T cells, and B cells express TLRs. TLR3 recognizes double-stranded RNA, TLR4 recognizes lipopolysaccharide, TLR7/8 recognizes single-stranded RNA, and TLR9 recognizes unmethylatedCpG DNA[20].TLR activation through MyD88- and TRIF-dependent pathways causes nuclear translocation of NF-B, IRF-3, and IRF-7, producing pro-inflammatory cytokines (IL-1, IL-6, TNF-) and type I IFN-/, which are necessary for antiviral responses. [21].

II. MATERIAL AND METHOD

A. Sampling and Source

A case-control study was enrolled from October 2021 to June 2022 at Al Hussein Teaching hospital, DhiQar-Southern Iraq. During the process of collecting data, the patients' names, marital status, gender, and ages were. The clinical investigation included fever, headache, shortness of breath, runny nose, diarrhea, and cough; each patient's personal information and clinical illness data were recorded on a single questionnaire. Blood samples were collected from symptomatic patients in-hospital suffering from COVID-19 infections. All patients with COVID-19 enrolled in this study were positive nasopharyngeal swabs in RT-PCR and CT scan and /or X-ray

The sample studied were (N=176) cases, including 88 patients and 88 from a control sample (healthy person). The mean age was (51) years, ranging between 29 to 73 years

B. Sampling

To conduct medical tests, blood samples were drawn from patients as follows:

Venous blood of 10 ml was drawn from patients in the isolation ward with covid 19 patients through two syringes of 5 ml. The blood was divided into 3mL in an EDTA tube for the hematology test, 3 mL in a gel tube for CRP, 3 mL in the sodium citrate tube for the D dimer test,

C. Exclusion criteria

All of the patients suffer from atopic illnesses. All patients have autoimmune disorders, Patients suffering from infectious disorders, and Suspected patients with COVID-19 infection but with negative PCR

D.Laboratory examination :

1- Hematological assays methods:

Hematological parameters were performed on EDTA blood using (SPINREACT / spin) in the hematology laboratory of Al Rifai General Hospital five par to estimate numbers and percentages of white blood cells. Whole blood was collected via an EDTA tube. An automatic hematology analyzer(SPINREACT / spin) was used to measure, Total WBCs, monocytes, Lymphocytes Neutrophils, Eosinophils, basophils, and platelets

2- Biochemical test

C reactive Protein Test Assay

The UPT Analyzer will be warmed and stabilized for 20 minutes. Press the setting button on the device's screen and choose the read parameter. Enter, scan the barcode, and insert the test card to get the result. The result that was obtained after five minutes

D Dimer Rapid Quantitative Test

Finecare'sFIA system requires you to insert your ID chip. The pipette was used for sampling. 15 pL of whole blood or 10 pL plasma was collected and added to the Detection Buffer tube. Results are presented on the main screen and may be printed using the "Print" button.

Statistical analysis

The SPSS (Standard Tool for Social Science) statistics program version 23 and Microsoft Excel 2010 are used throughout the statistical analysis process. The definition of the numerical data was determined using the mean and the standard deviation of the mean. Logistic regression was used to examine differences between the various groups. The statistical significance threshold for a difference of 0.05 or less is generally recognized.

III. THE RESULTS

A. Demographical study

A case-control study was conducted on 88 patients with covid 19. The number of cases is determined using a minimal size equation that depends on the ratio of the disease, along with (88) people who were considered the control group. They were all examined and found to be free of any respiratory illnesses or other health issues that were also analyzed.

Table (3-1) documented that the highest age group of patients with covid_19 was the (45-54 years) where 26 (29.5 %) ofthe total study patients,while fewer cases of covid_19 patients appeared at ≤ 30were 9 (10.2%) from total study cases.Statistics show these differences were not significant (p-value = 0.128*).

Table (3-1): Distribution of the sampled population by age group (years)

Categorial age group (Yrs.)		Studied Groups		Total	P-value
		Patient	Control		
≤ 30	Count (%)	9 (10.2%)	11 (12.5)	20 (11.3%)	0.128*
31-40	Count (%)	20 (22.7%)	28 (31.8%)	48 (27.2%)	
41-50	Count (%)	26 (29.5%)	25 (28.4%)	51 (28.9%)	
51-60	Count (%)	21 (23.9%)	17 (19.3%)	38 (43.2%)	
> 60	Count (%)	12 (13.6%)	7 (7.9%)	19 (10.8%)	
Total	Count (%)	88 (100%)	88 (100%)	176 (100%)	

1) Patient and Control Gender Distribution for Covid 19

From a total of 88 study participants, male groups had the most significant percentage of COVID-19 occurrences, with 47 (53.4%) compared to 41 (45.8%) for female groups (100.0 percent).and 38 (43.2%) for male groups compared to 50 (56.3%) for female groups from the overall research controls. According to statistics, these deviations were insignificant (sig = 0.451), as shown in the following Table.

Table (3-2): Distribution of the study population by gender group

Gender		Studies groups		Total	sig
		Patient	Control		
male	Count (%)	47 (53.4%)	38 (43.2%)	85 (48.3%)	0.451**
Female	Count (%)	41 (45.8%)	50 (56.3%)	91 (51.7%)	
Total	Count (%)	88 (100%)	88 (100%)	176 (100%)	

2) Smoking characteristics of the study population

Table (3-3) compares some of the basic characteristics of patients and controls. It is clear from the Table that there was no significant statistical difference in these characteristics in the two groups.

Table (3-3): Smoking characteristics of the study population

Characteristic	Patient	Control	Total	Sig.
Smoking				
Yes	31	22	53	0.454**
	35.2%	25.0%	30.1%	
No	57	66	123	
	64.7%	75.0%	69.9%	
Total	88	88	176	
	100.0%	100.0%	100.0%	

* Mann Whitney U Test
** Chi^2 Test

B. Clinical study

1) Clinical symptoms

Table (3-4) presents the distribution of clinical features among patients. The most frequent symptom was fever (82.9%), and the least was diarrhea (21.6%).

Table (3-4): Clinical features of patients

Feature	Number*	Percent*
Fever	73	82.9
Headache	62	70.4
Muscle/ body aches	59	67
Loss of taste and/ or smell	45	51.1
Cough	44	50.0
Shortness/ difficulty in breathing	32	36.3
Congestion or runny nose	33	37.5
Chest pain	28	31.8
Nausea or vomiting	24	27.2
Diarrhea	19	21.6

* A patient may have more than one symptom.

3) Laboratory study

a) Comparison of leukocytes among studied groups

Table (3-5) clarifies that the only significant statistical differences were in eosinophil and basophil levels when compared between patients and controls.

Table (3-5): Comparison of leukocyte indices between patient and control groups

Category		WBCs (10^9/L)	Neu (10^9/L)	Lym (10^9/L)	Mon (10^9/L)	Eos (10^9/L)	Bas (10^9/L)
Patient	N	88	88	88	88	88	88
	Mean ±SD	8.90± 3.81	5.86±3.01	2.33±1.24	0.72± 0.42	0.04 ±0.15	0.0006± 0.002
Control	N	88	88	88	88	88	88
	Mean ±SD	7.70± 1.72	4.18±1.03	2.23±0.61	0.86± 0.36	0.36 ±0.23	0.07±0.09
Sig.*		0.463	0.061	0.705	0.164	0.0001	0.0001

* Mann Whitney-U Test

b) Comparison of D dimer and CRP among studied groups

Table (3-6) shows that D-dimer and CRP levels differed statistically significantly between patients and controls.

TABLE (3-6): COMPARISON OF D-DIMER AND CRP INDICES BETWEEN PATIENT AND CONTROL GROUPS

Category		D-dimer (ng/ml)	CRP(mg/L)
Patient	N	88	88
	Mean±SD	1489.70±1947.52	53.16±39.01
Control	N	88	88
	Mean±SD	233.19±113.40	5.97±7.60
Sig.*		0.0001	0.0001

* Mann Whitney-U Test

IV. THE DISCUSSION

Coronavirus disease 2019 (COVID-19) has become a global public health issue since its discovery at the end of 2019. The lower airway is the primary site of infection for coronavirus 2 in severe acute respiratory syndrome (SARS-CoV-2) [22]. The current coronavirus disease 2019 (COVID-19) outbreak is a worldwide emergency, as its rapid spread and the high mortality rate has caused severe disruptions [23].

A case-control study was conducted on 88 cases of COVID-19 patients, whose ages ranged from (29 to 73 years). The highest age group of patients with covid 19 in this investigation was (45-54 years) where 26 (29.5%) ofthe total study patients, 88 (100.0%), followed by (55-64 years) were 21 (23.9%), at the second to third decades (35-44) years they were 20 (22.7%), and the decades (65) years covid 19 patients were (100%).These results are similar toDhuaif (2021)that observed the patients were divided into three age groups (15–45 years old, 46–65 years old, and 66–85 years old), and their numbers were 169 (30%), 235 (43%), and 156 (27%), respectively [24].Another study by Huang(2020) says that people are generally susceptible to COVID-19, including older middle-aged people are more

predisposed to COVID-19 (median age of onset is about 55 years)[25].

From the 88 study participants, 47 (53.4%) of the male groups had covid 19 instances, compared to 41 (45.8%) of the female groups. Men are more mobile than women, especially when they have to leave for work, contributing to the higher rate of COVID-19 instances in men. Men are naturally more sensitive to viruses than women are, in addition to mobility at work.According to results that supported the study of Hikmawati and Setiyabudi (2020), mostCOVID-19 patients were male (56.5%).[26].the study of Rabaan(2020) agrees with this study by showingthat males (58%) have higher risk factors for covid_19 than females (42%)[5].

In this study, the most cases of covid_19 recorded non_smoking 57 (64.7%versus smokers were 31 (35.2%)from total study cases, which reflects no significant positive effect of smoking among studied patients and controls groups(p-value =0.454).These results, supported by [27],observed that the number of never-smoker patientsis more than a smoker. In 10 Chinese studies, smoking prevalence in hospitalized patients ranged from 3.8% to 14.6%. Low smoking prevalence among hospitalized patients was also observed in Korean and USA covid_19 patients [28].

In the current study that the most clinical symptom was fever (82.9%), and the least was diarrhea (21.6%). Headache(70.4%), muscle/ body ache(67%), loss of taste and/ or smell(51.1%), cough(50%), congestion or runny nose(37.5%), shortness/ difficulty of breathing (36.3%), chest pain(31.8%), nausea or vomiting (27.2%).According to several prior studies, COVID-19's clinical symptoms included fever, cough, tiredness, pneumonia, headache, diarrhea, hemoptysis, and dyspnea.[26].**an**other study byRabaan (2020)reported that The most common clinical symptoms were similar to that of SARS-CoV infection: fever (87.9%), fatigue (69.6%), dry cough (67.7%), and myalgia (34.8%). A few infected patients also presented with rhinorrhoea, pharyngalgia, and diarrhea[5]. Some individuals demonstrated dyspnea and hypoxemia, which could ultimately result in acute respiratory distress syndrome (ARDS) and multiple organ dysfunction syndromes (MODS) within a week.[29]. Fever, cough, dyspnea, and shortness of breath are the COVID-19 symptoms that are most frequently reported. Other signs and symptoms include headache, disorientation, myalgia, odynophagia, anosmia, dysgeusia, diarrhea, nausea, and vomiting.[30].

The findings of this study demonstrated that COVID-19 patients with an elevated leukocyte count had a greater number of neutrophils and lymphocytes in their peripheral blood.The only significant statistical differences were in eosinophil and basophil levels when compared between patients and controls.The study[31] reported that Monocyte and eosinophil counts were linked inversely with sickness severity. Basophil numbers did not affect COVID-19 severity.NLR and NMR were positively linked with COVID-19 illness severity. In severe cases of COVID-19 pneumonia, neutrophilia due to the cytokine storm and/or lymphocytopenia were associated with a poor prognosis. Neutrophil to lymphocyte ratio (NLR) predicts early SARS CoV-2 illness severity. In tiny trials, severe patients had fewer granulocytes than non-severe patients.[32].

Our study showed that D-dimer and CRP levels differed statistically significantly between patients and controls.[33]reported thatCRP and D dimer is a significant marker of COVID-19 inflammation. Higher CRP and D dimer levels are associated with higher mortality in people with severe COVID-19 disease.Moreover, supported by [34]showed, that Elevated serum concentrations of CRP, PCT, D-dimer, and ferritin were related to an increased risk of mortality and severe COVID-19. Other research indicated that the blood CRP and D-Dimer concentrations (for diabetic patients) were favorably connected with the age of COVID-19 patients; however, no significant correlation was observed when comparing the prevalence of COVID-19 diseases by geographical region.[35].Milenkovic's (2022) study found that substantial abnormalities of laboratory parameters were found in patients with COVID-19 who were being treated in the intensive care unit. There was an increase in IL-6, CRP, PCT, and D-dimer levels.[33]

V. CONCLUSION

1. The age group (45 – 54) year has the greatest percentage of covid_19, males were more commonly infected with covid_19 than females, and there was no significant statistical among smoking patients.
2. The most common clinical symptoms of covid_19 were fever, headache, muscle/ body ache, loss of taste and/ or smell, cough, shortness/ difficulty of breathing, congestion or runny nose, chest pain, nausea or vomiting, and Diarrhea
3. The laboratory diagnosis of WBCs, D dimer,and CRP was elevated in covid_19, and there are statistically significant between patients and controls among eosinophil, basophil, D dimer, and CRP.

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