

COVID-19 AND ITS EFFECTS ON HYPERTENSION FLUCTUATIONS IN IRAQI PATIENTS

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Article history:	Abstract:			
Article history:Received:March 26th 2022Accepted:April 26th 2022Published:June 8th 2022	Abstract: COVID-19 is an infectious disease caused by the SARS-CoV-2 coronavirus, which more seriously affects patients of advanced ages and patients with immunodeficiency and chronic conditions, such as high blood pressure, and is of great importance in mortality from cardiovascular disease. vascular and cerebrovascular. This paper aims to know the effects of COVID-19 on hypertension fluctuations in Iraqi patients The retrospective study was conducted in one institution, different hospitals in Iraq, which is one of the main institutions for the care of patients with COVID-19 and 80 patients were collected and distributed into two groups, to 60 patients with hypertension and 20 patients as a control group,			
	It was concluded in this study that arterial hypertension is a clinical indicator			
	of its severity in COVID-19 patients, and the study shows patients with			
	hypertension have a higher mortality rate and also a higher likelihood of			
	complications (severe COVID-19, ARDS, need for ICU and disease			
Konwords: COV/ID-10 APDS ICIL T	D HE CKD CVA Equar hyportonsion			

INTRODUCTION

The clinical and epidemiological features of COVID-19 have been repeatedly reported, and one of the most common comorbidities among COVID-19 patients is hypertension [1,2]. Some studies have shown that hypertension is a risk factor for worse outcomes in patients with COVID-19

The coronavirus disease 2019 (COVID-19) caused by severe acute respiratory syndrome 2 (SARS)-CoV-2 has had severe consequences for health systems around the world. Arterial hypertension is the most common comorbidity in patients with COVID-19[3,4,5]. A large number of studies have revealed an overrepresentation of patients with arterial hypertension among patients hospitalized due to COVID-19. Arterial hypertension is also a risk factor for death in these patients. In a previous study of 20,982 patients with confirmed COVID-19, 12.6% had hypertension, the most common

underlying disorder. 39.7% of 406 deaths occurred in patients with arterial hypertension [6,7,8].

By reviewing previous studies related to the subject of our study, it was found that hypertension is associated with an increased risk of death in patients with Covid-19[9,10].

The study was conducted by Enrique Rodella, from the Hypertension Unit of Sagunto Hospital and a professor at the Cardinal Herrera University CEU in Valencia, on 12,226 patients aged between 18 and 80 years, and a soft relationship was found between patients with Covid 19 and hypertension [11,12,13].

The study indicates the death of 2,630 patients or 21.5 percent of cases. The most common comorbidities were high blood pressure with 50.9%, followed by diabetes with 19.1%, and atrial fibrillation with 11.2%. Analysis was strictly limited to patients who required hospital treatment. Focus on comorbidities associated with the severity of Covid-19 and use all-cause mortality to



analyze the study in a systematic and logical manner [14,15]

MATERIAL AND METHOD PATIENT SAMPLE

The retrospective study was conducted in one institution, different hospitals in Iraq, which is one of the main institutions for the care of patients with COVID-19

All patients with a confirmed diagnosis (for COVID-19 and hypertension, according to the guidelines of the Iraqi National Health Committee on the diagnosis and treatment of COVID-19 and the 2020 guidelines of the Ministry of Health for Hypertension) were identified.

Eighty patients were collected and distributed into two groups, to 60 patients with hypertension and 20 patients as a control group, as shown in the figure below.



Figure 1- Distribution of patient

Study Design

Demographic calculation, clinical characteristics, laboratory data, radiological findings, and treatments All biochemical and radiological studies were performed in the hospital at the time of admission, except for DNA tests to confirm infection with COVID 19

Using univariate and multivariate logistic regression models, risk factors for COVID-19 and in patients with arterial hypertension were analysed. Collected 80 patients distributed to 60 patients with hypertension and 20 were control group

evaluated 60 patients were by Compare with a cases control group and found patients with hypertension were more likely to develop severe disease.

Study period

This study was conducted for one year, which included (diagnosis, treatment, data analysis, and results for patients) from 5-12-2020 to 5-12- 2021

Aim of study

this paper aims to know the effects of COVID-19 on hypertension fluctuations in Iraqi patients

Statistical analysis

The demographic data and information were analysed by relying on the statistical analysis program SPSS IBM Soft 22, where the standard regression variables were represented as S.D., and statistical differences between the parameters were calculated by calculating (*pvalue)

Variables that were considered clinically relevant or that showed a univariate relationship with in-hospital mortality (P < 0.05) were included in the multivariate regression analysis.



RESULTS

Fig 2- Mean ±SD of patient groups according to age



Fig 3- Results of patients according to BP on admission



	G1	G2
Patients' comorbidities		
T2D	28 (46.6)	5 (25)
ASTHMA	9 (15)	2 (10)
HF	5 (8.33)	1 (5)
CKD	3 (5)	3 (15)
CVA	3 (5)	2 (10)
Obesity	7 (11.6)	3 (15)
other	5 (8.33)	4 (20)
drugs on admission		
ACEI	10 (16.6)	****

ARB	3 (5)	****
BB	2 (3.3)	****
Beta-blockers	5 (8.3)	****
Symptoms		
Fever	19	4
Headache ±temperature	15	3
Cough	5	2
Diarrhea	8	2
aches and pains	4	1
tiredness	2	3
Others	7	5

Table 2- Results of the patient according to Laboratory Findings (median)

	Patie	nt	Contr	ol	
NEU, (1 × 109/L)	5.1 6.5)	(3.7–	2.9 5.4)	(2.2–	0.003
LYM, (1 × 109/L)	0.8 1.3)	(0.4–	1.3 1.8)	(0.8–	0.001
MON, (1 × 109/L)	0.3 0.5)	(0.2–	0.5 0.6)	(0.3–	0.77
PLT, (1 × 109/L)	180 264)	(140–	195 247)	(154–	0.65
HGB, (g/L)	120 133)	(103–	128 140)	(116–	0.01
FIB, (g/L)	4.5 6.7)	(3.3–	4.2 4.8)	(3.3–	0.06



IL-6, (pg/ml)	30.1 (6.1– 70.2)	9.8 (2–26)	0.05
PCT, (ng/ml)	0.1 (0.1– 0.2)	0.1 (0-0.1)	0.001
CRP, (mg/L)	49 (10.2– 70.7)	10.1 (2.9– 48.2)	0.001
ALT, (U/L)	29 (20.4- 53.3)	20.4 (15.1– 33)	0.001

Fig 4- Results of patients according to BP profiles during hospitalization



Fig 5- Outcomes results of patients



Ρ	P-value
age	0.042
sex	0.98
Symptoms	0.003
T2D	0.001
ASTHMA	0.44
HF	0.88
СКD	0.9
CVA	0.9
Obesity	0.01
other	0.01
drugs on admission	0.001
Sepsis	0.002
ARDS	0.002
Shock	0.002
ICU admission	0.002
In-hospital mortality	0.0098

Table 4- Logistic regression values demographic data of patient group

	CI 95% FROM	CI 95% TO
Age >60 years	2.3	12.2
Sex	1.5	3.3
T2D	4.5	11.9
HF	3.8	8.8
CKD	4.8	13.3
Obesity	5.8	13.6
Hypertension	5.5	15.3

Table 3- P-value results of the study



Table 5- Comparison of clinical outcome of patients between the patient and control groups

	Total patients (n=80	Unmatched		
		Patient	control	P
Outcome	es, count ((<u>) or me</u>	edian (IQ	
		-	_	-
ICU during stay	17 (21.25 %)	15 (18.75 %)	2 (2.5%)	0.002 3
Mortality	8 (10%)	7 (8.75%)	1 (1.25 %)	0.001
Hospitalisati on time (days)	11 (7– 17)	12 (8– 16)	10 (8– 12)	0.001

DISCUSSION

Data and demographic information were collected from several hospitals where the hospital's comprehensive record was relied on to collect data for patients. The patients were divided into two groups (60 hypertension+ patients) and (20 control).

In Figure 1, the patients were distributed according to age for C1 (male patients 55 ± 11) (female patients 54 ± 10) As for group 2 (male patients 58 ± 8.23) (female patients 53 ± 14.3)

The most frequent symptoms were fever for 19 patients, headache and fever for 15 patients, followed by diarrhea for eight patients, and for comorbidities, diabetes was the most frequent for 28 patients with 46.6% and asthma for nine patients with 15%, followed by Obesity for seven patients, with 11.6%, as shown in Table 1

Patients with hypertension have a higher likelihood of death, severe COVID-19, acute respiratory distress syndrome, need for an intensive care unit, and disease progression [16].

In addition, meta-regression showed that hypertension had a worse outcome according to the age of patients, and the effect was higher in this study Age >60 years, CI 95% (2.3 ± 12.2)

A study showed a statistically significant association between hypertension and the development of acute respiratory distress syndrome (HR 15.3; 95% CI 9.3; p = 0.00 1), and other variables such as DM and age showed a highly significant relationship with COVID 19[5].

Recently, Leiva Sisnieguez CE et al. commented on the study by Ruan et al. [12]. They noted that hypertension was a risk factor for death in COVID-19 patients, although they did not perform a multivariate analysis to adjust for potential confounders.

The major findings of this study are that high BP fluctuation was significantly associated with in-hospital mortality. Moreover, this high BPV had a proportional relationship with advanced age, high levels of inflammatory markers such as CRP, and worse clinical outcomes, including cardiac and renal injury.

In a study conducted at Wuhan Lung Hospital between December 25, 2019, and February 7, 2020, to determine the factors associated with the death of patients with COVID-19 pneumonia. Nineteen showed that there were more deaths. In the group with arterial hypertension (61.9% vs 28.5%, p = 0.005) and cardiovascular or cerebrovascular disease (57.1% vs 10.8%, p < 0.001).

High blood pressure is a common cardiovascular risk factor in the elderly, and in a similar way to what happens with the Coronavirus, it affects a greater number of malignancies in the adult population; Therefore, it is one of the most common cardiovascular risk factors in affected patients.

It should be noted that the majority of patients who require hospitalization because of their complications suffer from high blood pressure, and 25 studies conducted showed that the average age of patients with a serious condition was 73 years, so the same prevalence of arterial hypertension would be at that age, where it is associated with increased chronic systemic inflammation, and this puts the hypertensive patient at a higher step in his inflammatory state, and the virus begins its massive immune activity with the patient more vulnerable

In hypertensive patients, their inflammatory state is associated with endothelial dysfunction, which is mainly characterized by a defect in the production of substances with a vasoconstrictor and vasodilator effect, resulting in a state of circulatory dysfunction of varying severity.

It is crucial to remember that the renin-angiotensinaldosterone system is present in hypertensive patients as it is in patients with other cardiovascular and renal



diseases. This system consists of peptides and enzymes that lead to the synthesis of angiotensin, the effects of which are mediated by the action of AT1 and AT2 receptors and are involved in controlling cardiovascular function and hemodynamic homeostasis.

SARS-CoV-2 uses angiotensin-converting enzyme-2 as a receptor to enter and infect cells in the lining of blood vessels and heart tissue and presumably uses ACE inhibitors and angiotensin-1 receptors, which could have severe consequences in the context of COVID-19. ACE 2 inhibits the activity of angiotensin II

In a study conducted in China, it was shown that male patients of advanced age or with associated diseases (or both), including arterial hypertension, with elevated ACE2, had a worse prognosis during the development of COVID-19.

CONCLUSION

Hypertension is currently a public health problem in Iraq and the world, and currently, the same is happening with covid-19

The association between both diseases leads to an increase of the mortality rate for patients with COVID-19.

The study shows a patient with hypertension have a higher mortality rate and also a higher likelihood of complications (severe COVID-19, ARDS, need for ICU, and disease progression) which also leads to higher healthcare costs.

RECOMMENDATION

Scientific studies indicate that people with uncontrolled or untreated hypertension may be at greater risk of developing severe illness from the emerging coronavirus (Covid-19). This increased risk is not seen when hypertension is adequately treated with medication.

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	Total patien ts (Unmatched		
	n=73 6)	Hypertens ion (n=220)	Non- hypertens ion (n=516)	P valu e
Outcomes,	count (°	%) or media	an (IQR)	
ICU during stay	78 (10.6 %)	28 (12.7%)	50 (9.7%)	0.22 4
Mortality	32 (4.3%)	17 (7.7%)	15 (2.9%)	0.00 3
Hospitalisa tion time (days)	13 (9– 19)	14 (10– 22)	13 (8–18)	0.00