



EVALUATE THE RELATIONSHIP BETWEEN EOSINOPHILS AND COVID-19 PATIENTS.

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Abstract:

This study aims to evaluate and know the relationship between eosinophilia and COVID-19 patients. Patients were collected from different hospitals in Iraq, where 50 patients were collected and divided into two groups with eosinophilia that included 30 patients, and without eosinophilia, 20 patients. After obtaining the necessary approvals from the Ethics Committee to carry out this study, it will study and analyze the demographic data of patients for a period of one full year from 5-5-2020 to 6-9-2021, and we found a positive relationship was found between eosinophilia in Covid-19 patients.

Keywords: Eosinophils, Covid-19, Cells, Comorbidities.

INTRODUCTION

A new form of a respiratory and systemic disorder named coronavirus disease 2019 (COVID-19) is caused by the severe acute respiratory syndrome coronavirus. A new and more infectious virus than that of severe acute respiratory syndrome and the Middle East respiratory syndrome. The clinical symptoms of COVID-19 are fever, cough, fatigue, extremity pain, and gastrointestinal symptoms and Severe patients often experience progressive dyspnea and/or refractory hypoxemia one week after onset and rapidly develop acute respiratory distress syndrome, septic shock, multiple organ failure, and other manifestations. COVID-19 disease is a serious challenge to medicine and science in our country; in order to better understand the processes that lead to leukopenia in covid 19 patients, it is necessary to understand where and how eosinophilic granulosa cells form and function [1,2,3]. The place of formation is the bone marrow, where they are produced from a stem cell, and then the cells acquire the structure of eosinophils and enter the bloodstream, and then into the tissues. Especially in large quantities, it accumulates in those organs in contact (skin, lungs, alimentary canal) where eosinophils are involved in inflammatory processes and allergic reactions [4,5,6].

It is noted from previous studies that there is a direct positive effect or relationship between the Coronavirus

with an unexpected and unjustified low number of eosinophils during a stay in treatment units or central care, as this study focused on knowing and analyzing the excessive number of citrus fruits for Covid 19 disease [7,8,9,10].

Therefore, low eosinophils can be a sign of a large number of diseases and conditions of completely different nature and varying degrees of risk, and the number of eosinophils alone cannot indicate a specific disease, so if fewer described cells are found in the blood [11,12,13,14].

Material and method

Patient sample

Patients were collected from different hospitals in Iraq, where 50 patients were collected and divided into two groups with eosinophilia that included 30 patients, and without eosinophilia, 20 patients

Study design

A survey was conducted to find out the low number of eosinophils in patients with coronavirus, where 50 patients were collected and divided into two groups. In the group of patients, the number of male patients was 70%, female patients, 30%. In the second group, the number of male patients was 20 and female patients were 5

Eosinophilia (eosinophilia) is defined as an increase in the number of eosinophils in the peripheral blood



above 500 cells per microliter. It has many causes and associated diseases but often reflects an allergic reaction or a parasitic infection. Diagnosis involves selective examination directed at clinically suspected causes, then appropriate treatment given to the cause of the disease.

Eosinophils have the characteristics of an immune response, whereby an agent such as Trichophyton elicits a primary immune response with relatively low levels of eosinophils, while repeated exposure generates an eosinophil-enhanced response or a secondary eosinophil-high response.

Several compounds secreted by mast cells and basophils include an eosinophil producer by type E immunoglobulin. These include anaphylactic factor eosinophils, leukotriene (B4), complement complexes (C5-C6-C7), and histamine (within a narrow range of concentration).

Study period

The study period for collecting patient information, in addition to demographic characteristics, was for a full year, from 5-5-2020 to 6-9-2021.

Aim of study

This study aims to eosinophilia in a patient with COVID-19

Results

Table 1- compression of a patient according to age

Statistics		All patient	with eosinophilia	without eosinophilia
N	Valid	50	30	20
	Missing	1	21	31
Mean		61.2600	58.9000	64.8000
Median		61.5000	59.0000	66.0000
Mode		70.00	59.00	70.00
Std. Deviation		6.18032	5.93267	4.77493
Skewness		-.190	.314	-.939
Std. Error of Skewness		.337	.427	.512
Range		20.00	20.00	16.00
Minimum		50.00	50.00	54.00
Maximum		70.00	70.00	70.00
Percentiles	25	55.7500	54.0000	62.2500
	50	61.5000	59.0000	66.0000
	75	66.2500	62.7500	69.0000

Table 2- frequency of patients according to age

P	F	P
All patient		
50-54	9	17.6
55-59	12	23.5
60-64	10	19.6
65-70	19	37.3



Total	50	98.0
with eosinophilia		
50-54	8	15.7
55-59	10	19.6
60-64	5	9.8
65-70	7	13.7
Total	30	58.8
Missing System	21	41.2
without eosinophilia		
50-54	1	2.0
55-59	2	3.9
60-64	5	9.8
65-70	12	23.5
Total	20	39.2
Missing System	31	60.8
sex with eosinophilia		
F	10	33.3
M	20	66.6
sex without eosinophilia		
f	5	25
m	15	75
simplified acute physiology score with eosinophilia	25	50
sepsis-related organ failure assessment	11	22
indicated comorbidities		
Cardiovascular disease	3	10.0
Chronic bronchitis	2	6.7
Chronic lung disease	4	13.3
Diabetes	8	26.7
Hypertension	13	43.3
Total	30	100.0



Figure 1- p-value between groups

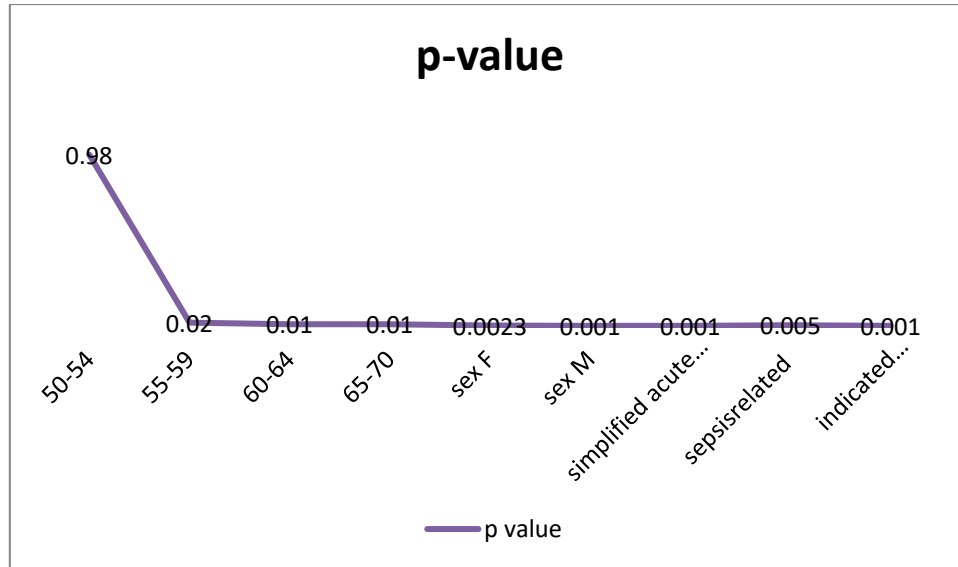


Table 3- frequency of patient according to results from ICU admission

Statistics									
		MEC PATIENT cell/mm ³	MEC CONTROL cell/mm ³	Fibrinogen PATIENT g/L	Fibrinogen CONTROL g/L	D dimers PATIENT µg/mL	D dimers CONTROL µg/mL	Platelets Count PATIENT G/L	Platelets count CONTROL G/L
N	Valid	30	20	30	20	30	20	30	19
	Missing	21	31	21	31	21	31	21	32
Mean		10.5	2.5	7.1	8.4	9144.4	2668.8	291.4	206.9
Std. Deviation		5.94	1.27733	0.81931	.82078	2530.02	1706.9	39.04	27.14
Range		19.00	3.00	2.00	2.00	8000	5800.00	145.00	90
Minimum		1.00	1.00	6.00	7.00	5000	1200.00	200.00	160
Maximum		20.00	4.00	8.00	9.00	13000	7000	345.00	250

Figure 2- p-value

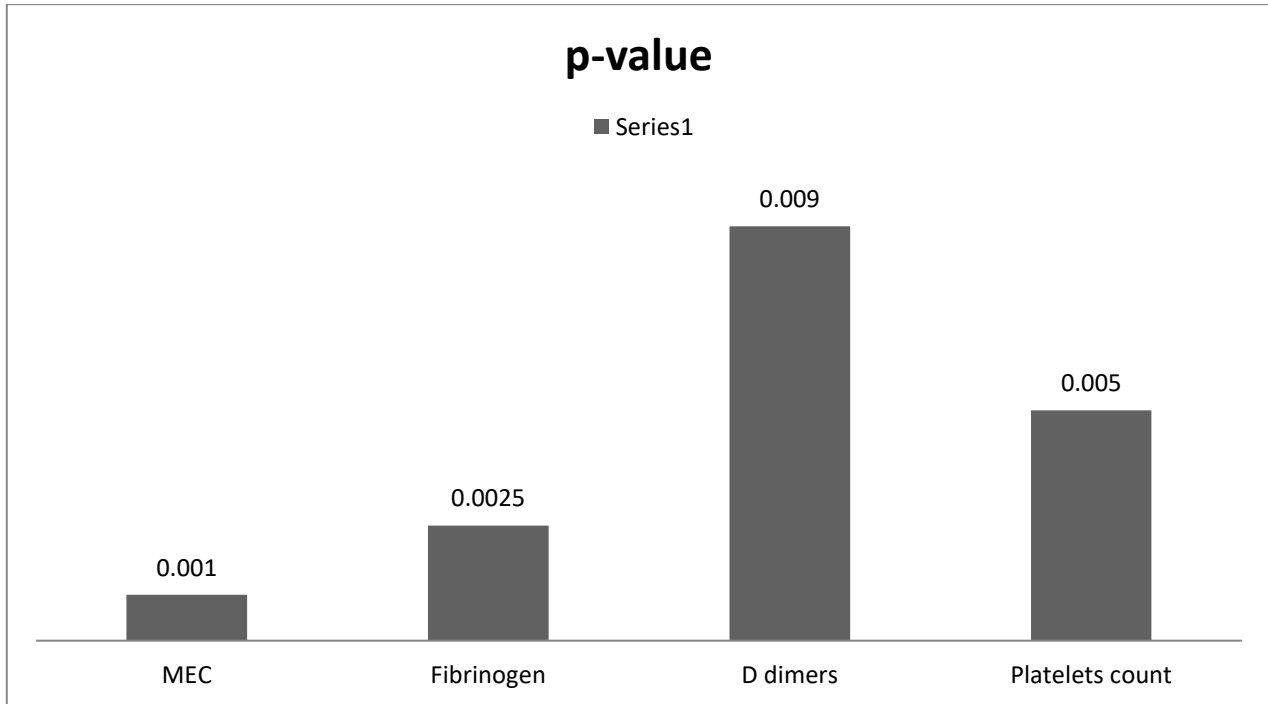


Figure 3- Results of eosinophilia (patient 30) according to Eosinophil count at ICU admission

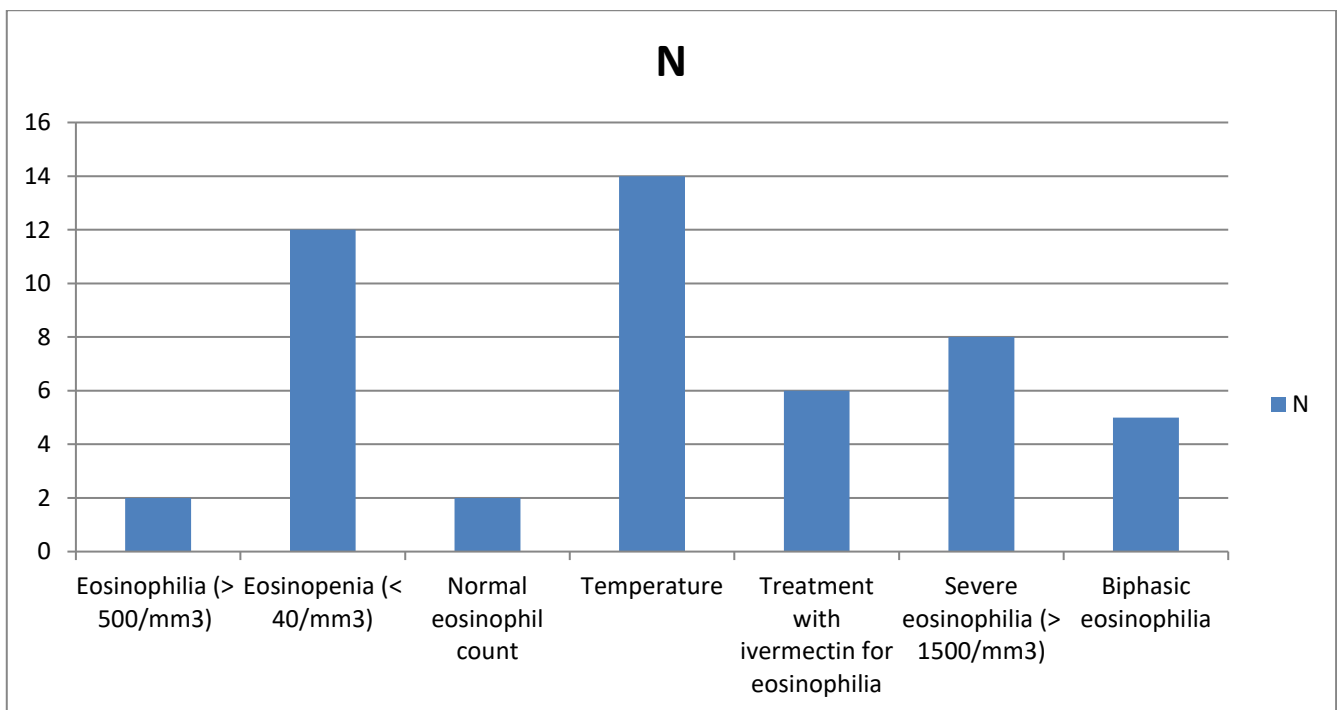
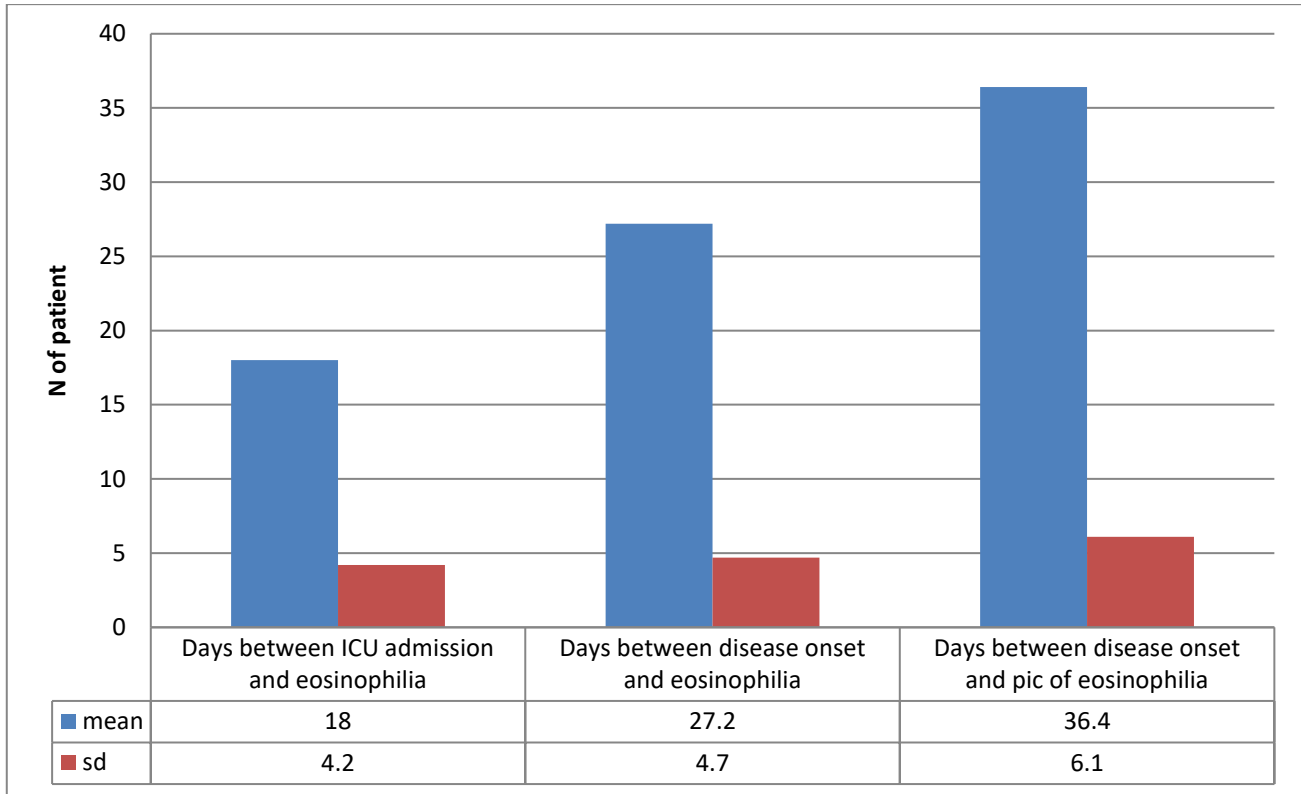


Figure 4- Results of eosinophilia according to Eosinophilia during ICU stay (days)



DISCUSSION

This study was conducted on 30 patients and 20 control groups to find out eosinophilia in patients with coronavirus.

With eosinophilia, the most frequent category is 55-59 years for ten patients, as for without eosinophilia, The most frequent age group was 65-70 years. As for the distribution of patients by sex, we note that in a group of with eosinophilia, 20 patients were men and ten women, as for the total number of patients without eosinophilia, male patients were 15, and the female patients were 5, and the statistical analysis program was relied on for the purpose of analyzing the demographic data and information of the patients. The mean sd. to ages with eosinophilia was (61.2±6.18).

As for indicated comorbidities, It was the most frequent Hypertension for 13 patients, a rate of 43.3%, and in second place Diabetes. For eight patients, statistical differences were found between the two groups > 0.001. As for Table 3, which shows the mean value between the two groups, where we note in MEC patient cell/mm³ Where we note the existing height if compared to the second group, as for Fibrinogen PATIENT g/L The statistical differences were few, but we notice their decrease in the group with eosinophilia, where the mean sd was (7.1±0.8).

Mild eosinophilia itself does not cause symptoms, but levels greater than 1500 cells per microliter may cause organ damage if persistent. Damage is usually caused by tissue inflammation, a reaction to cytokines and chemokines secreted by eosinophils, as well as immune cells that have been attracted to tissues. Any organ can develop eosinophilia, but the heart, lungs, spleen, skin, and nervous system are usually affected. Sometimes patients with severe eosinophilia (> 100,000 cells per microliter) or eosinophilic leukemia develop multiple complications, in which eosinophils form clumps that block small blood vessels, causing tissue ischemia and small partial damage to vessels, usually manifested in disease Caused by ischemia of cerebral or pulmonary tissues

CONCLUSION

Eosinophilia occurs when too many eosinophils are found in a particular location in the body or when the bone marrow produces too many eosinophils. This could be due to a variety of factors, one of the most notable being the COVID-19 virus

Eosinophil counts vary with age, gender, and time of day (they can vary up to 40% more at night than in the morning due to cortisol levels)



RECOMMENDATION

1. Most eosinophilia is resolved by treating the underlying cause
2. In the case of primary eosinophilia without organic intervention, treatment is usually not necessary.

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