

Relationship of crp to lymphocyte ratio with prognosis and mortality in Covid 19

ABSTRACT

Background: The Covid 19 pandemic is a serious disease that has infected millions of people and died tens of thousands. The clinical findings of the disease is observed in a wide range from asymptomatic to death. On the other hand, abnormal pathological variety is findings in laboratory parameters.

Aims: In this study, it was aimed to relation laboratory parameters with prognosis and mortality in the admission intensive care.

Study Design: Ersin Arslan Training and Research Hospital Covid Intensive-care unit between July 1, 2021, and September 30, 2021.

Methodology: The laboratory parameters (in the first 24 hours) of a total of 197 patients (113 male, 84 female) hospitalized in the Covid 19 Intensive-care unit were examined. The relationship of these parameters with intubation and mortality was analyzed retrospectively. Wilcoxon Signed-Rank test was used for statistical data.

Results: The mean age was 64.6 ± 2.16 (21-95) years. 57.3% were male and 42.7% female. WBC values of the patients were 46.8% high and 53.2% normal. According to lymphocyte values; 55.3% lymphopenia, 43.6% normal lymphocytes, 1.1% lymphocytosis. Procalcitonin value were more than normal in 88.8% of patients. CRP values were more than normal in the first 24 hours in 98.9% of the patients. Normal reference range values are WBC 4-10 μ L, CRP 0-5 mg/L, Lymphocyte 0.8-4 μ L. According to normal reference ranges; WBC/Lymphocyte 1-12.5 and CRP/Lymphocyte 0-6.25 values were admitted normal ranges. Mortality rate of patients admitted in Intensive-care found as 54.8%.

Conclusion: Intensive-care Unit admission patients is more often in male and over 60 years old. Mortality is more in female patients and between the ages of 21-60. WBC/Lymphocyte ratio has no significant relationship with mortality. A CRP/Lymphocyte ratio more than 100 is related with mortality in patients with and without a history of steroid treatment.

Keywords: Covid-19, CRP, laboratory, lymphocyte, mortality

1. INTRODUCTION

The Covid 19 pandemic is a serious disease that has infected millions of people and died tens of thousands. Although SARS-CoV-2 has responded to treatments in some countries, it continues to spread rapidly in many regions [1]. The clinical findings of the disease is observed in a wide range from asymptomatic to death. On the other hand, abnormal pathological variety is findings in laboratory parameters. In this study, it was aimed to relation laboratory parameters with prognosis and mortality in the admission intensive care.

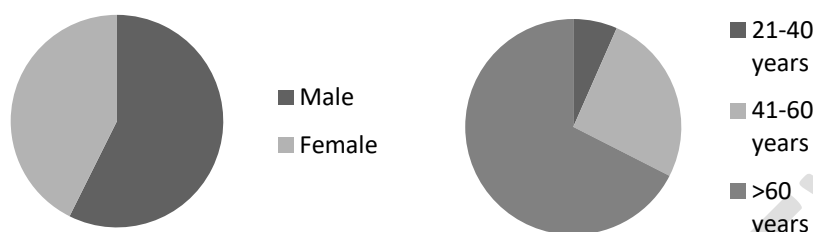
2. MATERIAL AND METHODS

Ersin Arslan Training and Research Hospital Covid Intensive-care Unit between July 1, 2021, and September 30, 2021. A total of 197 patients (113 male, 84 female) were examined. White blood cell (WBC), C-reaktif protein (CRP), lymphocyte and procalcitonin (PCT) values, treatment of steroid, intubation day and mortality status were recorded from the laboratory results of the patients within the first 24 hours. The relationships of the recorded data with each other were evaluated. Wilcoxon Signed-Rank test was used for statistical analysis.

3. RESULTS AND DISCUSSION

A total of 197 patients were analyzed. The mean age was 64.6 ± 2.16 (21-95) years. 57.3% were male and 42.7% female. Most of the patients were over 60 years old (67.5%). WBC values of the patients were 46.8% high and 53.2% normal (normal reference range 4-10 μL) (Figure 1). Lymphocyte values; 55.3% lymphopenia, 43.6% normal lymphocytes, 1.1% lymphocytosis (normal range 0.8-4 μL). CRP results were 98.9% high (normal range 0-5 mg/L). High PCT value was 26.3% of the patients (normal range 0-0.5 ng/ml). 86.8% had a history of steroid treatment. 58.3% intubated (in Intensive-care) and 54.8% died of the patients. According to the lower and upper reference values; WBC/Lymphocyte (W/L): 1-12.5 and CRP/Lymphocyte (C/L): 0-6.25 values were admitted normal ranges. Wilcoxon Signed-Rank test was used for statistical analysis.

Figure 1. Distribution of the study population by age and gender



According to this; In Covid-19, male and over the age of 60 patients are admitted to more often intensive care units. Female gender and over 60 years are related with mortality ($p < 0.04$). Leukocytosis and lymphocytosis are not significantly related with mortality ($p < 0.1$). Although high PCT value is not related with intubation, it is related significant with mortality ($p < 0.0001$). High W/L value is not significantly related with mortality and intubation ($p < 0.1$). A CRP/L value more than 100 is related with both intubation and mortality in those with a history of steroid treatment. ($p < 0.0001$) (Table 1).

Table 1. Statistical analysis results of the study

	n	SD	95% CI	
Gender				
Male	113	0.49	± 0.06	
Female	84			
Ages	64.7 (21-95)	15.3	± 2.17	
Mortality				
Paramaters	n	z	p<	ODSS
Female	84	-2.043	0.04	0.842
>60 years	133	2508	0.01	2.590
High Procalcitonin	52	-5.070	0.0001	1.812
Yüksek W/L	100		0.1	
Low W/L	5		0.7	
History of steroids (Yes)				
CRP/Lymphosite > 100	171	-4.862	0.0001	1.623
History of steroids (No)				
CRP/Lymphosite > 100	26	-1.867	0.06	1.444

Eosinopenia and lymphopenia have been reported in many studies in Covid 19. The reason for this may be the distribution variety of white blood cells as a result of cytokine storm by T cells [2,3]. In our study, although eosinopenia was rare, lymphopenia was more often. It has been reported that 77.8% of the patients are

between the ages of 30-69 and 2.4% younger the age of 18 in Covid 19 [4]. In this study, 67.5% of the patients were older than 60 years and the median age was 67 years (21-95). As in this study, lymphopenia has been reported to be related with mortality in many studies [5]. C-reactive protein values are very important parameter in detecting infection and response of treatment [6]. We found that 98.9% of the patients admitted in the Intensive care unit had high CRP values in the first 24 hours. 58.3% intubated and 54.3% died, almost all of patients were related with high CRP values. Although most of the patients admitted in the intensive care unit were male, mortality was more often in female patients. No significant relationship was found between neutrophilia and neutropenia with mortality. Treatment of steroid is also used to suppress inflammation in Covid 19. Mortality was more often with a history of steroids in patients. Procalcitonin values are among the sepsis diagnostic criteria. Procalcitonin value were more than normal in 88.8% of Covid 19 patients admitted in the intensive care unit. In the study, W/L and CRP/L ratios of laboratory parameters were found to be significant with mortality. According to normal reference ranges; WBC/Lymphocyte (W/L): 1-12.5 and CRP/Lymphocyte (C/L): 0-6.25 values were admitted normal ranges. As a result of the statistical analysis, the significance value of the W/L ratio was low. Therefore, the relationship between W/L value and mortality was not considered. However, a statistically significant related was found between CRP/L value and mortality. Accordingly, in those without a history of steroid treatment ($p < 0.06$) and in those with a history of steroid treatment ($p < 0.0001$); A CRP/L value of more than 100 is related with mortality.

4. CONCLUSION

Intensive-care Unit admission patients is more often in male and over 60 years old. Mortality is more in female patients and between the ages of 21-60. WBC/Lymphocyte ratio has no significant relationship with mortality. A CRP/Lymphocyte ratio more than 100 is related with mortality in patients with and without a history of steroid treatment.

DATA AVAILABILITY

The data are recording, and it is most of available in the article.

ETHICAL APPROVAL

Republic of Turkey Ministry of Health 2021-09-18T22_38_39 numbered and Gaziantep University Medical Ethics Committee 2021/322 numbered approval have been received.

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