Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 6, 2021, Pages. 6651 - 6655
Received 25 April 2021; Accepted 08 May 2021.

Study of Some Hematological Parameters in Patients with COVID 19 in Kirkuk

Jalank Hameed Mahmoud
Department of Community Health Techniques ,Technical Institute of Kirkuk ,
Northern Technical University , Iraq

Abstract

The World Health Organization has confirmed that Coronavirus disease2019(Covid19)is a worldwide pandemic. Attention was drawn to the changes that occur in patients'different blood parameters with Covid-19 infection. Therefore, this study is an attempt to assess the pattern of some hematological parameters in some Covid 19 affected persons in the city of Kirkuk in northern Iraq. White blood cells count, lymphocyte count, and neutrophil count were studied in patients with Covid19 as well as red blood cell count and hemoglobin concentration.This is an observational study in 60 laboratory-confirmed patients whose case of Covid 19 was referred to the General Hospital in the town center, from September 1, 2020 to November 30, 2020. Analysis of the data statistics was performed, and the relevant results were presented.Of the 50 patients, 34 were male and 26 were female, ranging in age from 19 to 83 years, with 39 patients over 51 years old. The results showed that there was leukopenia in 44 patients, lymphopenia in 50 patients, and neutropenia in 45 of them.It was concluded that leukocytes, lymphocytes and neutrophils can be used from hematological criteria, which have a prominent role in the diagnosis of Covid19.

Keywords: *Blood parameters,leukopenia,lymphopenia ,Covid 19 infection*.

Introduction

The Coronavirus (Covid-19) is considered a global health emergency, because there are millions of infections with the huge numbers of deaths worldwide[1-3].It causes respiratory disease that may lead to highly progressive pneumonia, multi-organ dysfunction and death in harshlydamaged patients[4-6].The earlyaffected case of COVID-19 was detected in Iraq on February 24, 2020, in Najaf Governorate, for an Iranian student. This was followed by 4 cases from one family in the city of Kirkuk, and it was found that they also had a travel history to Iran[7,8] .Blood tests perform an essential role in the primary diagnosesof infection, along with the data provided byphysicians relating the inflammatory process. This information includes the white blood cell count and its characteristics suchas the level of neutrophils or lymphocytes, etc.Given previous research, the use of circulating biomarkers that represent inflammation and anemia were considered as a predictive sign in patients infected with COVID-19[9-13].In this study, the roles of biomarkers from a peripheral blood sample in diagnosing hospitalized COVID-19 patients were examined.

Methods

Sixty personswho werereportedly infectedwithCOVID-19 and were referred to the General Hospital in the city of Kirkuk in northern Iraq, which was a center for admitting Covid 19 patients at the governorate level, were enrolled in this study, from September 1, 2020 to November 30, 2020.Cases of Covid-19 infection identified by a positively affirmative result on an inverse transcript - polymerase chain reaction (RT-PCR) test ofa sample gatheredupon a test of swab from the nasopharynx. The recorded information includes demographic features and hematological parameters through the hospital data management system. Blood samples were collected and then samples were processed in an automated hematology

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 6, 2021, Pages. 6651 - 6655
Received 25 April 2021; Accepted 08 May 2021.

analyzer.The following parameters were observed and measured: hemoglobin (HB), , red blood cells count (RBCs),white blood cells (WBCs), neutrophils(NEU) count, and lymphocytes (LYM) count .Descriptive data regarding statistics were employed in order to review the data. Results are informed as levels or / and averaged as appropriate.

Results

This study included 60 patients divided into 34 males and 26 females, ranging in age from 19 years to 83 years.Thirty-nine patients, over the age of 51, and three cases over 81 years, as shown in Figure 1.

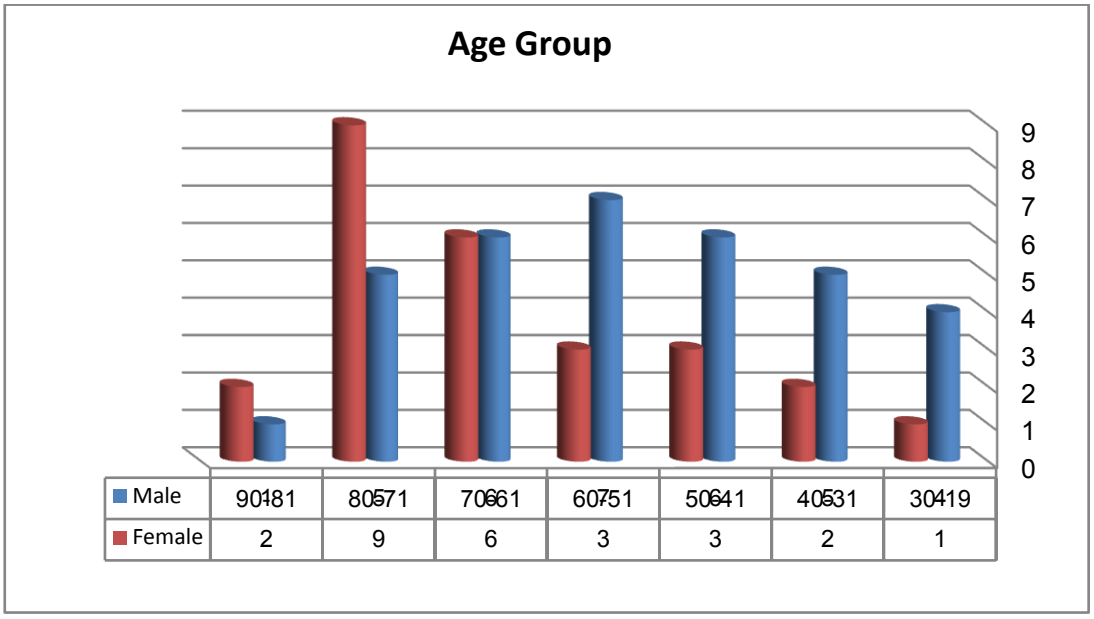
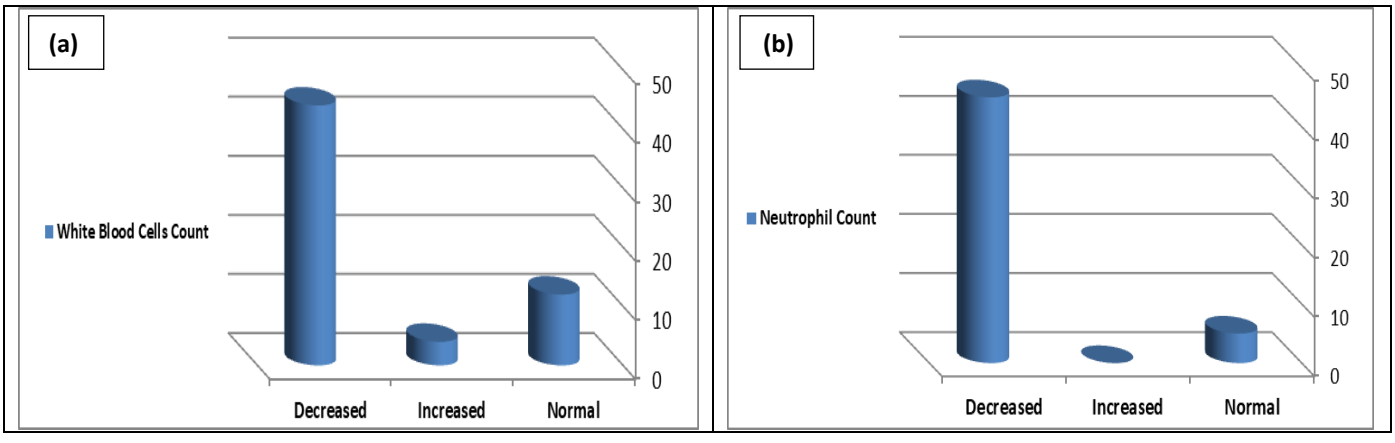


Figure 1: Diagram showing the age distribution of COVID-19 patients by gender. (N = 60)

A routine complete blood count test was done for all patients after admission.The results showed that the white blood cells, neutrophil , and the lymphocyte countsin the COVID-19 patients were essentially in the decrease reference levels. Many patients had different degrees of red blood cells count and hemoglobin concentrations (figure 2).



Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 6, 2021, Pages. 6651 - 6655
Received 25 April 2021; Accepted 08 May 2021.

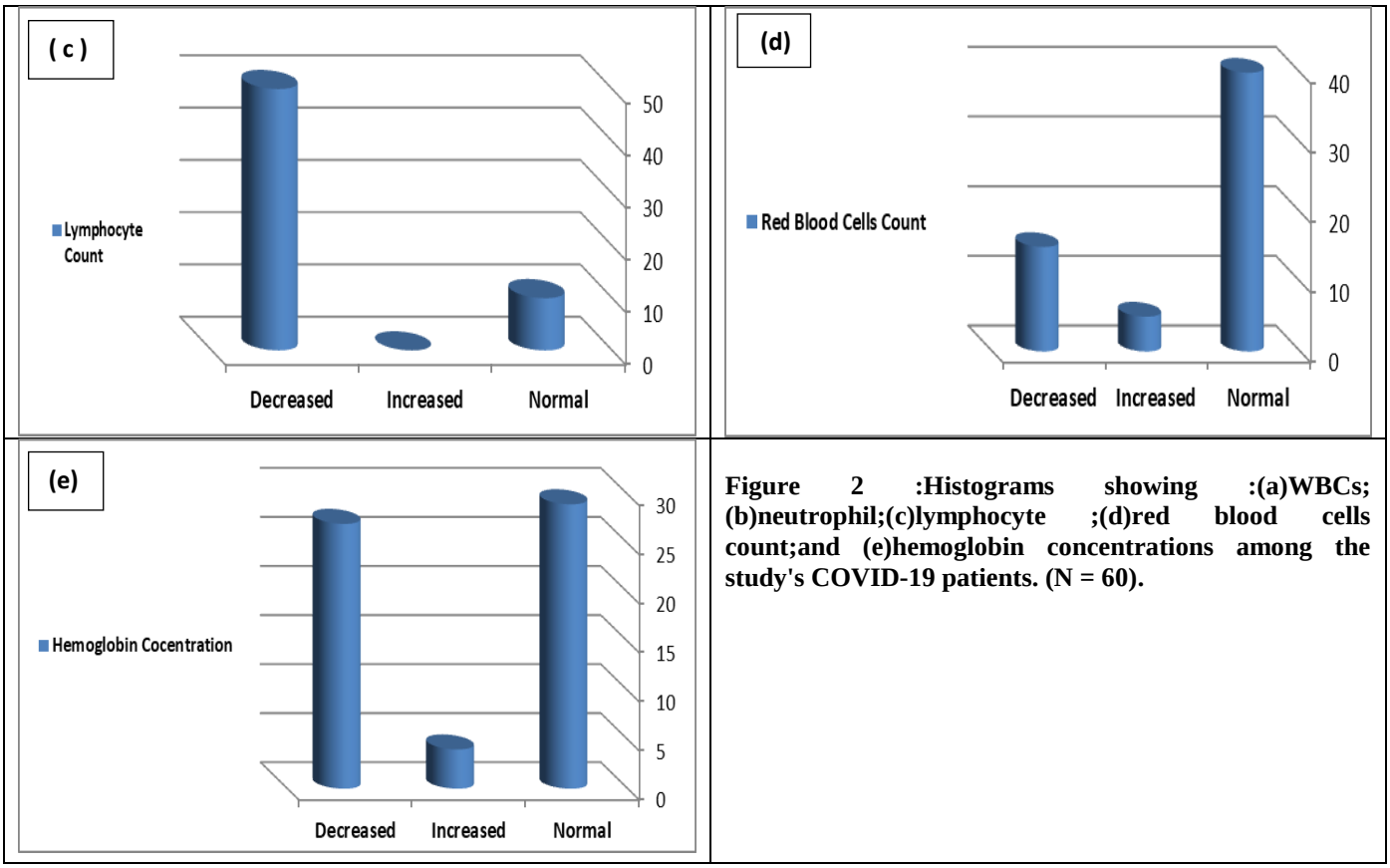


Figure 2 :Histograms showing :(a)WBCs; (b)neutrophil;(c)lymphocyte ;(d)red blood cells count;and (e)hemoglobin concentrations among the study's COVID-19 patients. (N = 60).

Discussion

Among the hematological biomarkers employed to categorize COVID-19 infected persons into stratification: the count of white blood cell, lymphocyte count, ratio of lymphocyte (NLR), and hemoglobin concentration[14,15].A complete blood count (CBC) is easy and inexpensive. CBC values such as white blood count, neutrophils, lymphocytes were included. They can be used as inflammatory markers. Neutrophils are the most distinct cell type among white blood cells and are an important component of the immune system.The role of lymphocytes in both inflammation and infection is clear[16-18] .Identifications hematological parameters can help predict disease severity and thus guide clinical care. Lymphopenia has become significance at this point[19,20].Based on previous research, the use of circulating biomarkers that represent inflammation and the immune system was considered as a predictive sign in patients with COVID-19. However, their diagnostic usefulness has not been precisely confirmed[21].

Conclusions

COVID-19 patients upon admission clearly demonstrated lymphopenia and leukopenia.Accurate assessment of laboratory indications upon admission can be helpful for clinicians in formulating treatment approaches to achieve better outcomes.

References

1- Faiq TN, Ghareeb OA, Fadhel MF. Characteristics and Outcomes of COVID 19 Patients in Kirkuk City, Iraq. Annals of the Romanian Society for Cell Biology. 2021 Apr 30:12432-8.

2- Mallah SI, Ghorab OK, Al-Salmi S, Abdellatif OS, Tharmaratnam T, Iskandar MA, Sefen JA, Sidhu P, Atallah B, El-Lababidi R, Al-Qahtani M. COVID-19: breaking down a global health crisis. Annals of Clinical Microbiology and Antimicrobials. 2021 Dec;20(1):1-36.
3- Coccia M. High health expenditures and low exposure of population to air pollution as critical factors that can reduce fatality rate in COVID-19 pandemic crisis. Environmental Research. 2021 May 21:111339.
4- GHAREEB OA, RAMADHAN SA. COVID 19-A Novel Zoonotic Disease: Origin, Prevention and Control.
5- AL-HAIDARI KA, FAIQ TN, GHAREEB OA. Preventive Value of Black Seed in People at Risk of Infection with COVID–19.
6- Roedl K, Jarczak D, Fischer M, Haddad M, Boenisch O, de Heer G, Burdelski C, Frings D, Sensen B, Karakas M, Kluge S. MR-proAdrenomedullin as a predictor of renal replacement therapy in a cohort of critically ill patients with COVID-19. Biomarkers. 2021 Apr 2:1-8.
7- SULTAN AI, IBRAHIM JM, GHAREEB OA. The Prevalence of Emergency Surgical Conditions among Covid-19 Patients in Kirkuk Province, Iraq.
8- Abdulsattar BO, Jones IM. The Pandemic of COVID-19: Current Scheme of Iraq (24 February-8 August 2020). Rafidain Journal of Science. 2021 Mar 1;30(1):11-7.
9- Acar E, Demir A, Yıldırım B, Kaya MG, Gökçek K. The role of hemogram parameters and CRP in predicting mortality in COVID- 19 infection. International journal of clinical practice. 2021 Apr 22:e14256.
10- Baumann R, Untersmayr E, Zissler UM, Eyerich S, Adcock IM, Brockow K, Biedermann T, Ollert M, Chaker AM, Pfaar O, Garn H. Noninvasive and minimally invasive techniques for the diagnosis and management of allergic diseases. Allergy. 2021 Apr;76(4):1010-23.
11- Rossi B, Santos-Lima B, Terrabuio E, Zenaro E, Constantin G. Common Peripheral Immunity Mechanisms in Multiple Sclerosis and Alzheimer's Disease. Frontiers in Immunology. 2021 Feb 19;12:404.
12- Teer E, Joseph DE, Glashoff RH, Essop MF. Monocyte/Macrophage-Mediated Innate Immunity in HIV-1 Infection: From Early Response to Late Dysregulation and Links to Cardiovascular Diseases Onset. VirologicaSinica. 2021 Jan 5:1-2.
13- Oh SM, Skendelas JP, Macdonald E, Bergamini M, Goel S, Choi J, Segal KR, Vivek K, Nair S, Leff J. On-admission anemia predicts mortality in COVID-19 patients: A single center, retrospective cohort study. The American journal of emergency medicine. 2021 Oct 1;48:140-7.
14- Ponti G, Maccaferri M, Ruini C, Tomasi A, Ozben T. Biomarkers associated with COVID-19 disease progression. Critical reviews in clinical laboratory sciences. 2020 Aug 17;57(6):389-99.
15- Fang YN, Tong MS, Sung PH, Chen YL, Chen CH, Tsai NW, Huang CJ, Chang YT, Chen SF, Chang WN, Lu CH. Higher neutrophil counts and neutrophil-to-lymphocyte ratio predict prognostic outcomes in patients after non-atrial fibrillation-caused ischemic stroke. Biomedical journal. 2017 Jun 1;40(3):154-62.
16- Wan Z, Song L, Hu L, Lei X, Huang Y, Lv Y, Yu S. The role of systemic inflammation in the association between serum 25-hydroxyvitamin D and type 2 diabetes mellitus. Clinical Nutrition. 2021 Apr 27.
17- Ghareeb OA. Toxic Effect of Silver Nanoparticles on Some Hematological Parameters and Possible Preventive Role of MoringaOleifera: In Vivo. Annals of the Romanian Society for Cell Biology. 2021 May 3:13796-801.

18- Bai B, Xu Z, Hu Y, Qu M, Cheng J, Luo S, Yao Z, Gao H, Ma Y, Gao R, Hou J. Patient hematology during hospitalization for viral pneumonia caused by SARS-CoV-2 and non-SARS-CoV-2 agents: a retrospective study. European Journal of Medical Research. 2021 Dec;26(1):1-1.
19- Bhatraju PK, Ghassemieh BJ, Nichols M, Kim R, Jerome KR, Nalla AK, Greninger AL, Pipavath S, Wurfel MM, Evans L, Kritek PA. Covid-19 in critically ill patients in the Seattle region—case series. New England Journal of Medicine. 2020 May 21;382(21):2012-22.
20- Tan L, Wang Q, Zhang D, Ding J, Huang Q, Tang YQ, Wang Q, Miao H. Lymphopenia predicts disease severity of COVID-19: a descriptive and predictive study. Signal transduction and targeted therapy. 2020 Mar 27;5(1):1-3.
21- Liu J, Liu Y, Xiang P, Pu L, Xiong H, Li C, Zhang M, Tan J, Xu Y, Song R, Song M. Neutrophil-to-lymphocyte ratio predicts critical illness patients with 2019 coronavirus disease in the early stage. Journal of Translational Medicine. 2020 Dec;18:1-2.