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Mini Review

Several peripheral blood cells and the infection of sever acute respiratory syndrome coronavirus 2

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Blood routine is a common laboratory index in clinic, and used as an auxiliary item for diagnosing many diseases. Currently, sever acute respiratory syndrome coronavirus 2 (SARS-Cov-2) infection has been a pandemic concern which severely threatens human health [1]. Many clinicians and researchers around the world are focusing on the study of such an infection or the coronavirus disease (COVID-19) caused by the pathogen. Among the studies, the changes of Peripheral Blood Cells (PBC) belong to blood routine are generally investigated [2,3]. In the present report, we will overview the studies on the several PBC of the patients with SARS-Cov-2 infection.

The count of white blood cells and SARS-Cov-2 infection

As a routine laboratory index, White Blood Cell (WBC) is often detected for many disease in clinic. In the studies on SARS-Cov-2 infection, several scholars found that the count of WBC increased in some patients, and the percent of increase persons were 24% [4] to 30% [5]. Contrarily, in the same reports, the number of WBC exhibited decline and the decline ratios were 25% and 9%, respectively [4,5]. Obviously, except for the percentages of increase and decrease, there are more than a half of the patients (51% or 61%) exhibited normal for the count of WBC. Hence, the value of detecting WBC remain uncertain. However, the clinical significance of WBC combining with other laboratory indices are evaluated presently. Scholar Shi and his colleagues [6], reported that there were relatively higher sensitivity and specificity for WBC count combining with C-Reactive Protein (CRP) and serum amyloid A protein (SAA) for

diagnosing COVID-19, and the two diagnosis parameters were 100% and 78.67%. This finding indicates that the combination detection of WBC count, CRP and SAA probably help to the diagnosis of COVID-19.

Neutrophile and SARS-Cov-2 infection

Neutrophile is another PMC often changes in the patients with COVID-19. In Li' study [7], the number of neutrophiles of the patients with COVID-19 pneumonia was significantly lower than that of the patients with un-COVID-19 pneumonia. Furtherly, another study team compared two types of patients with COVID-19; they found that the neutrophiles count of sever-type of patients was statistically higher than that of common-type of ones [8]. Huang, et al. [5], did the same job and found the similar difference between the two types of the patients with COVID-19. While in the report of Xu, et al. [9], the difference between the two types of patients was found no significance. On the basis of current researches, what the actual role the neutrophiles does play in the assessment of COVID-19 progress still need further and more investigation.

Eosinophile and SARS-Cov-2 infection

Eosinophile is an effective index to assess allergic diseases or several hematological disease in clinic. Currently, a few researchers found that there is certain a relation between the item and COVID-19. A study showed that and the the number of eosinophiles of the patients with COVID-19 pneumonia was statistically higher than that of patients with non-COVID-19

pneumonia [7]. Zhang's team [10], further found that more than half of the patients had eosinopenia; meanwhile, there was a positive relation between the count of eosinophiles in peripheral blood positively with the that of lymphocytes in the objects infected with SARS-Cov-2. Due to the number of lymphocytes is considered as an index related to COVID-19 [11], therefore it is suggested that the number of eosinophiles should also be relative to COVID-19 progress.

Lymphocyte and SARS-Cov-2 infection

Lymphocyte number or percentage in the total count of WBC is generally relative to SARS-Cov-2 infection of COVID-19. Some reports showed that the number or percentage decrease in the relative disease, and more than half of the patients with COVID-19 had lymphopenia [12,13]. In Zhang's [10] and Chu's studies [14], the decrease degree of lymphocytes was found related to the severity of COVID-19, that is, along with the progress of COVID-19, lymphocyte number declined accordingly. Precisely, a research team even found the cutoff to divide common and severe COVID-19: when the number of lymphocytes less than $0.4 \times 10^9/L$, the percent of severe cases was high to 81.8%; when the percent of lymphocytes $<10\%$, the ratio of severe cases was about 81.3% [15]. Accordingly, several researchers thought that the count or percentage of lymphocytes could be taken as an index to evaluate the severity in clinic [16,17].

In conclusion, it is possible that there are certain relations between the several PBC and SARS-Cov-2 infection or COVID-19; however, the accurate significance and usage of these cell in diagnosis of COVID-19 need further study to confirm by clinician and researchers.

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