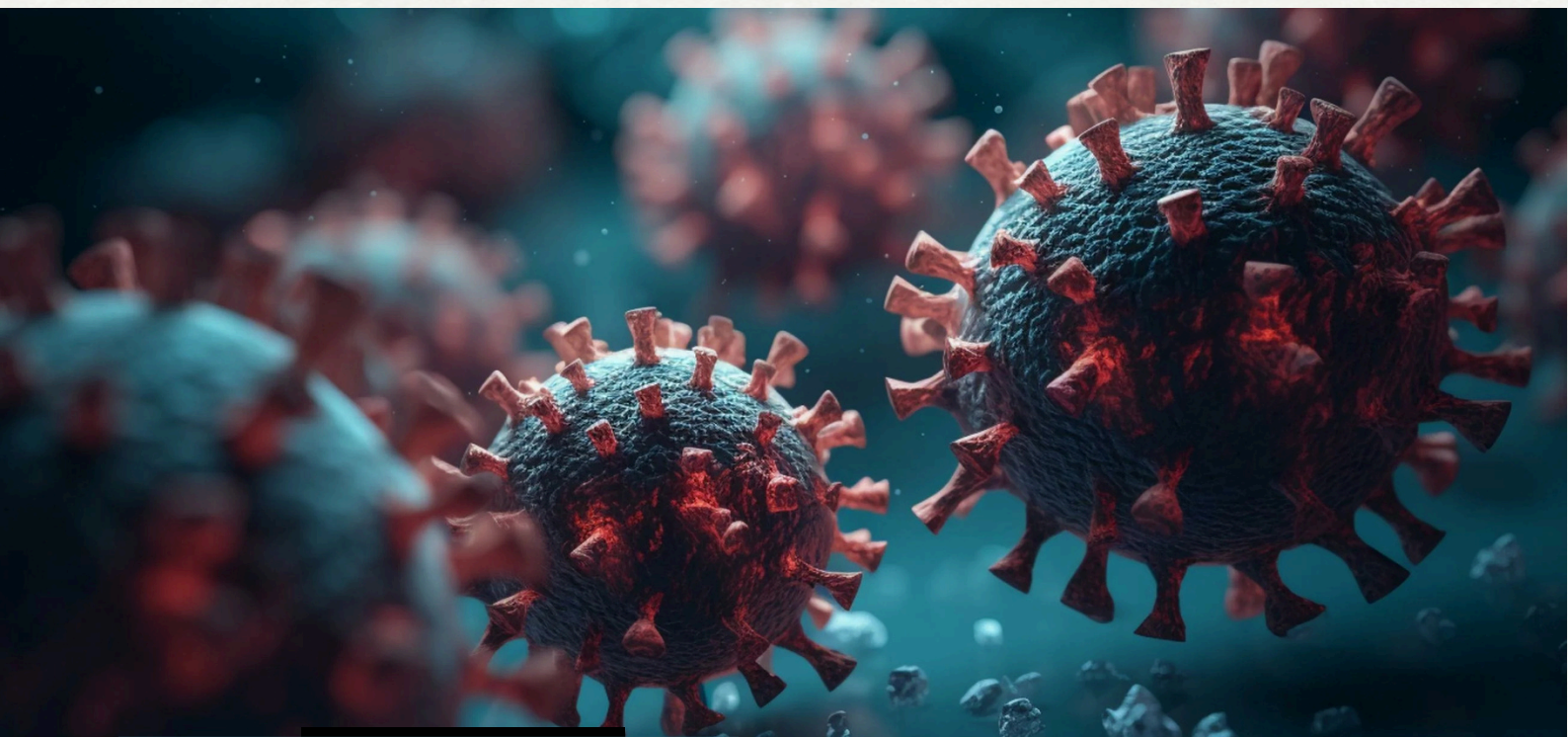


# PRESCRIPTION

LATEST NEWS AND UPDATES FROM THE FACULTY OF PHARMACY



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## Evaluation and correlation of hematological, inflammatory and serological responses among COVID-19 patients admitted to intensive care unit

The global response to this severe pandemic disease relies heavily on clinical laboratory testing, which plays a vital role in early diagnosis, treatment, and epidemiological surveillance. Molecular, serological, and biochemical diagnostic methods have been applied in the detection of COVID-19 cases. The RT-PCR-based molecular methods have become the gold standard technique used across the world for COVID-19 confirmatory of infection based on the qualitative detection of the nucleic acids of SARS-CoV-2. However, it might show a false negative result, it can only detect 71% of COVID-19 infections depending on the time symptoms appear (viral load) or any sampling error may occur. To prevent possible cross-reaction with other prevalent coronaviruses, the assay should include at least two molecular targets.

Furthermore, accuracy and rapid response of COVID-19 diagnosis is essential for optimum patient care, infection control, and epidemiological surveillance. Therefore, we aimed to correlate hematological, inflammatory indicators and serological responses among COVID-19 patients (n=138) Intensive care unit (ICU, n=99) and non-ICU patients (n=64) as compared to health subjects as a control (n=40). For the COVID-19 (n=163) and the control group (n=40), the complete blood count (CBC) analysis revealed significant differences in the Hemoglobin (Hb), HCT, RBCs, MCV, WBC, and Lymphocyte count (p-value < 0.05) with no significant difference in MCH, MCHC, and platelet count. The CRP, LDH, and serum ferritin levels showed significant differences between the two groups (p-value <0.05). For the ICU- and non-ICU patients, a significant difference in the Hb, HCT, RBCs, MCV, MCH, WBC, and Lymphocyte count (p-value < 0.05) was observed. Significant differences in the level of CRP and serum ferritin while no significant difference was observed in the level of LDH. Patients with positive IgM or IgG antibodies were more prevalent to be associated with decreased HCT, Lymphocytes, and WBC count, and increased CRP, LDH, and serum ferritin levels. While patients with negative IgM or IgG antibodies are predominantly associated with low hemoglobin levels, low red blood cell indices, and low platelet count. A significant association between the appearance of serum IgG or IgM and the possibility of not being admitted to the ICU was also observed. In conclusion, combining hematological, biochemical, and serological data allows a more comprehensive understanding of COVID-19 prognosis and patient management. Although serum ferritin and LDH levels can offer information about the extent of inflammation, they might not be the exclusive factor influencing the decision for ICU admission. Appearance of serum IgG or IgM indicates a better prognosis and the possibility of not being admitted to the ICU.

Combining serological tests with hematological tests can serve as an alternative approach for diagnosing COVID-19 in situations where RT-PCR testing might not be readily available or when test results are inconclusive. Healthcare professionals might use a combination of available tests, clinical evaluation, and patient history to make informed decisions regarding diagnosis and treatment. Finally, from this study we can conclude that each diagnostic method offers unique insights into different aspects of the infection, allowing for a more comprehensive understanding of COVID-19 in patients. A well-coordinated diagnostic strategy is essential to optimize COVID-19 diagnosis and patient management. To enhance result accuracy and reduce the risk of false negatives when utilizing the cobas® 6800 system RT-PCR, it is advised to consider collecting another sample. Although serum ferritin and LDH levels can offer information about the extent of inflammation, they might not be the exclusive factor influencing the decision for ICU admission. Using serological and hematological tests together can provide a broader perspective on a person's health status.

### **List of Abbreviation**

COVID-19 (Corona virus Diseases-2019), Hb: Hemoglobin, RBC: Red Blood Cells, HCT: Hematocrit, MCV: Mean Corpuscular Volume, MCHC: Mean Corpuscular Hemoglobin Concentration, WBC: White Blood Cells, CRP: C - reactive protein, LDH: Lactate Dehydrogenase, ICU: Intensive Care Unit, RT-PCR: Reverse Transcription Polymerase Chain Reaction, IgG: Immunoglobulin G, IgM: Immunoglobulin M, SARS-CoV-2 (Sever Acute Respiratory Syndrome-Corona Virus-2).

### **Questions**

[Let's dive deeper into the article and evaluate your comprehension. We have three questions for you here.](#)

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