



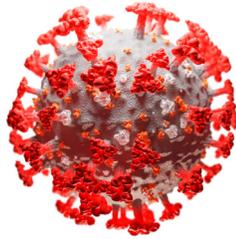
Tosoh Ink

News and Information from Tosoh Bioscience, Inc.

May 2021

Role of Ferritin and Other Immunoassays in Patients with SARS-CoV-2 Infection

Ferritin is an early indicator of the amount of iron stored in the body; it is a hollow sphere that permits the entry of variable amounts of iron for storage. Iron can be tested directly in the blood however Iron levels vary throughout the day and are influenced by oral supplements and the amount of iron in a person's diet. Therefore, Ferritin is the most specific indicator of depleted or overloaded iron deposits in the body. If a Ferritin test reveals that your blood ferritin level is lower than normal, it indicates your body's iron stores are low and you have iron deficiency. If a ferritin test shows higher than normal levels, it could indicate that you have a condition that causes your body to store too much iron.



Anemia is a common blood disorder where your body 1) makes 2) destroys or 3) loses too many Red Blood Cells (RBC's). RBC's contain hemoglobin which carries oxygen throughout the body. Hemoglobin contains iron which is used in the oxygen transport, muscle metabolism and DNA synthesis. Iron overload can result in liver, heart and hormonal diseases such as diabetes. Early diagnosis is needed for prompt treatment of the anemia and to avoid further iron accumulation in the body.

Recently Ferritin testing has gained new interest. Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) develops into COVID-19 disease which can lead to severe pneumonia and damage the liver, heart and kidneys. Increased levels of ferritin can be found in patients with COVID-19. Iron overload may affect cellular function and excess iron in the cells can lead to damage. Hyperferritinemia is associated with the body's inflammatory response to the SARS-CoV-19 infection and ferritin may be a useful parameter to predict the severity of the disease. Upon hospital admission, normal Ferritin levels were observed in patients with non-severe disease. Hyperferritinemia predicted the increased mortality risk.¹ Further studies are needed to determine if ferritin is a marker for disease progression or a key factor in the progression of the disease.

A significant increase in ferritin levels was demonstrated in patients with moderate and severe disease, compared to patients with mild disease. Severe patients had significantly higher levels of ferritin (2817.6 ng/mL) than non-severe patients (708.6 ng/mL).²

Tosoh Test Cup Features

- Dry reagent format
- 90-day calibration stability for most assays
- Single unitized cups
- No pre-mixing or pipetting
- Interchangeable with all AIA analyzers
- Bar-coded for inventory management
- 10-minute incubation time for most assays



Biotin Interference Free

Tosoh Bioscience's ferritin assay is free from biotin interference. Some people may take high doses of biotin (also known as vitamin B7 or B8) to stimulate hair and nail growth. However, the dietary recommendation of biotin is 30 ug/dL (30 ug/dL = 0.03 mg/dL). Most OTC supplements often contain 5 mg/dL or more.

Consuming this 'high dose' of biotin may interfere with some Ferritin test methodologies. For those assays, patients need to be cautioned to stop biotin consumption at least 72 hours prior to blood collection. Unfortunately, that is not always possible especially when unconscious patients are admitted to trauma centers. Excess biotin in the patient sample leads to an underestimation of ferritin levels (falsely lowers the result) which may lead to inappropriate medical intervention.

Biotin-Free Tests



TOSOH BIOSCIENCE

Immunoassays commonly tested in patients with SARS-CoV-2

Ferritin

"Ferritin as a marker of severity in COVID-19 Patients: a fatal correlation."

Isr Med Assoc J. 2020 Aug;22(8):494-500. PMID: 33236582

Cortisol

"Covid-19 patients with extremely high levels of the stress hormone cortisol in their blood are more likely to deteriorate quickly and die, according to new research in Lancet".

Association between high serum total cortisol concentrations and mortality from COVID-19.

Lancet Diabetes Endocrinol. 2020;8(8):659-660. [https://doi.org/10.1016/S2213-8587\(20\)30216-3](https://doi.org/10.1016/S2213-8587(20)30216-3)

Vitamin D

"The association observed may be explained by the role of vitamin D in the prevention of COVID-19 infection or more probably by a potential protection of vitamin D from the more negative consequences of infection."

The role of vitamin D in the prevention of coronavirus disease 2019 infection and mortality.

Aging Clin Exp Res (2020) 32:1195-1198. <https://doi.org/10.1007/s40520-020-01570-8>

C-Peptide and Insulin

"Chronic inflammation, increased coagulation activity, immune response impairment, and potential direct pancreatic damage by SARS-CoV-2 might be among the underlying mechanisms of the association between diabetes and COVID-19".

COVID-19 and diabetes: Knowledge in progress. Diabetes Res Clin Pract 162 (2020) 108142

<https://doi.org/10.1016/j.diabres.2020.108142>

ACTH

"Individuals with adrenal insufficiency have an increased rate of respiratory infection-related deaths, possibly due to impaired immune function and hence need to take extra precautions amid the ongoing COVID-19 pandemic".

COVID-19, hypothalamo-pituitary-adrenal axis and clinical implications.

Endocrine 68, 251-252 <https://doi.org/10.1007/s12020-020-02325-1>



AIA[®]-2000



AIA[®]-900



AIA[®]-360

References:

1. Ferritin levels and COVID-19. Rev Panam Salud Publica. 2020;44:e72.
2. Ferritin as a Marker of Severity in COVID-19 Patients: A Fatal Correlation. IMAJ 2020;22:428-434.



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