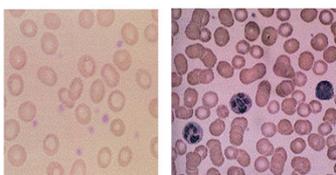


Soluble Transferrin Receptor, Ferritin, Iron Deficiency and other Chronic Disease states

Iron Profile (Iron, Transferrin, Ferritin) @ Kshs 3,950/=
Soluble Transferrin Recept

Iron Deficiency Anemia



anemia normal blood

Iron deficiency is one of the most common diseases worldwide. In the majority of cases, the diagnosis is relatively straightforward utilising classic indices including Hb, MCV, MCHC and iron profile. However, in several clinical conditions, classic biochemical indices such as serum iron, transferrin saturation and ferritin may not be fully informative, or change rapidly enough to reflect functional iron deficiency (1).

INFLAMMATION AND CHRONIC DISEASES

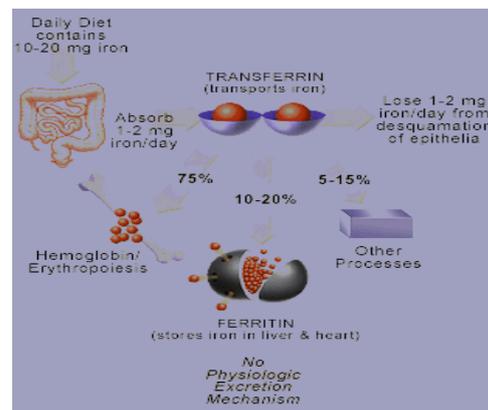
Iron status is influenced by inflammation. The normal control of iron metabolism is reorganized by the mediators of the acute phase response. Infection with the human immunodeficiency virus (HIV) affects millions of individuals in our patient population. It has a bigger impact on erythropoiesis than most infectious agents (4). Anaemia, a frequent complication of HIV-1, increases in severity as the disease progresses and is a negative prognostic indicator in infected patients (5). Haemoglobin and serum iron concentrations decrease and ferritin levels increase with HIV disease progression thus making it difficult to establish if these patient also have true iron deficiency. Ferritin concentrations correlate negatively with CD4 counts, and are highest in patients with AIDS. The sTfR however does not appear to be affected by HIV infection, as sTfR did not correlate with HIV disease progression or immune markers (5).

In many other chronic diseases, including chronic

Red Blood Cells



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SOLUBLE TRANSFERRIN RECEPTOR (sTfR)

The soluble transferrin receptor (sTfR) has an important role in the regulation of iron by mediating the cellular uptake of transferrin bound iron (2). Serum concentrations of the (sTfR) increase in iron deficiency when there is inadequate iron delivery to the bone marrow and tissues. In a study to evaluate the role of sTfR measurements in the assessment of iron status, serial measurements of serum iron, mean cell volume, serum ferritin and sTfR were performed by repeated phlebotomies in 14 normal volunteers. Based on the data generated, the authors suggested: that elevated sTfR is of value in identifying mild or early iron tissue deficiency; that serum ferritin concentrations are useful as a measure of iron stores and that haemoglobin concentration is an indicator of advanced iron deficiency (3).

IRON

Fluctuations in serum iron concentrations are observed in both physiological and pathological conditions. Importantly, serum iron concentrations exhibit diurnal variation and may be influenced by a number of other variables. For optimum evaluation of iron status, it is best to interpret serum iron levels together with other indices of iron status. Transferrin is the iron transport protein in the plasma, providing iron to cells through its interaction with a specific membrane receptor. The percentage saturation of transferrin provides further information on iron deficiency or overload.

FERRITIN

Ferritin represents storage iron and under normal conditions roughly reflects the body iron content. Ferritin concentrations decline early in the development of iron deficiency, long before changes are observed in blood Hb concentration, RBC size, or serum iron levels. Thus, the measurement of serum ferritin concentration can serve as a very sensitive indicator of iron deficiency that is uncomplicated by other concurrent disease. However, ferritin is an acute phase protein and will be increased in acute or chronic diseases even in the presence of iron deficiency.

renal disease and malignancy, ferritin and iron saturation values are frequently discordant, as they are, respectively, positive and negative acute phase reactants. Consequently, in the setting of inflammation or chronic disease, simultaneously high ferritin and low iron saturation are frequently encountered and difficult to evaluate. Under these circumstances, measurement of sTfR has a high sensitivity in the detection of iron deficiency.

In conclusion, the following points are important. Ferritin and sTfR are the most useful biomarkers for measuring iron status

- Interpretation of ferritin levels in populations where the incidence of infection or inflammation is high is problematic.
- An elevated concentration of sTfR is a good indicator of tissue iron deficiency, and is independent of iron stores measured by ferritin concentrations. STfR concentrations are not elevated in cases where anaemia is due to inflammation.

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