Impact of Oral Iron Challenges on Circulating Non-Transferrin-Bound Iron in Healthy Guatemalan Males

Abstract:
Introduction: Oral iron as a supplement has been associated with adverse health consequences, especially in the context of young children with active malaria. A potential aggravating role of non-transferrin-bound iron (NTBI) has been proposed. Material and Methods: NTBI responses in both a fasting and post-oral iron dosing situation were related to serum iron concentration and ferritin status. Fasting and 1, 2, and 3 h postdose serum samples were obtained in conjunction with oral ferrous sulfate supplementation in aqueous solution of 0, 15, 30, 60, 120 and 240 mg Fe in a cohort of 8 healthy Guatemalan men over a 9-week metabolic protocol. Hemoglobin, serum ferritin, percent transferrin saturation, serum iron and NTBI were all measured. Results: Circulating levels of serum iron and NTBI increased in a graded fashion in response to oral iron, with the relative increment for NTBI slightly greater than that of iron. Detectable NTBI was occasionally measured in fasting specimens, more frequently in subjects with high ferritin status. Post-iron NTBI responses, by contrast, were higher in normal-ferritin subjects in absolute terms, and rose with increasing postabsorptive serum iron responses. Discussion: The appearance and response of circulating NTBI were consistent with recognized principles of iron regulation.

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