CLINICAL SNAPSHOT

Biotin Interference in the Measurement of Thyroid Hormone

A 47-year-old man with multiple sclerosis (MS) presented for routine follow-up and underwent a battery of laboratory tests because of a change in his drug therapy for MS. He was found to have hyperthyroidism with positive thyroid-specific autoantibodies. This determination was made by an immunoassay based on streptavidin-biotin interaction. As the laboratory finding was not correlated with any clinical abnormality, no thyrostatic treatment was initiated. On further questioning, the patient stated that he was taking 300 mg of biotin daily to treat his MS. Another test with a non-biotinylated assay yielded normal findings.

It should be borne in mind that discrepancies between the clinical presentation and the laboratory findings of patients taking biotin may be due to biotin interference with the test. The test values that may be affected include endocrinological parameters, tumor markers, and myocardial lesion markers. There is some evidence for the efficacy of high-dose biotin intake against progressive MS; as clinical trials of this question are currently ongoing, it must be assumed that an increasing number of patients are high-dose biotin users. Biotin intake should be paused two to five days before streptavidin-biotin-based assays are used. Non-biotinylated assays are an alternative.

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The threshold biotin plasma concentration (ng/mL) for a >10% change in the value of the parameter in question in a streptavidin-biotin-based immunoassay. A biotin plasma concentration in the range of 0.25–0.6 ng/mL corresponds to a balanced metabolic state for biotin.

Anti-TPO-AB, anti-thyroperoxidase antibodies; anti-TSHr-AB, anti-TSH-receptor autoantibodies; fT4, free tetraiodothyronine; TSH, thyrotropin; fT3, free triiodothyronine