



Editorial

Biotin: A friend or foe in hair loss

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Biotin, a water-soluble vitamin, is not an enemy here; misinformation is. The glorification of its uncertain efficacy for hair loss and the lack of awareness about laboratory interference poses a potential hazard. For those concerned about inadequate biotin consumption, it can be innocuously administered in microgram doses to ensure sufficient intake while being subthreshold for laboratory interference; however, excessive daily doses are inadvisable. The widespread marketing of biotin for hair loss in healthy individuals is unsubstantiated. This view is supplemented by a recently published systematic review and meta-analysis with just three randomized controlled trials published on hair loss.

Biotin is Vitamin B7, also known as Vitamin H, from the German words “Haar und Haut,” which means “hair and skin.” Biotin has long been glamorized as a hair supplement, but the scientific evidence supporting this claim has been surprisingly lacking. Biotin is an essential cofactor for five mammalian carboxylase enzymes involved in gluconeogenesis, fatty acid synthesis, and amino acid catabolism. Mammals cannot synthesize biotin. However, deficiency is considered rare in Western countries since it is produced by intestinal flora and is available in a wide range of foods (namely, meat, fish, eggs, nuts, dairy, and some vegetables). A balanced Western diet provides 35–70 mcg of biotin daily, which exceeds the daily adequate intake of 30 mcg. Biotin deficiency can be either acquired or inherited. Acquired forms can be seen in pregnant and breastfeeding women, alcoholism, smoking, malabsorption, malnutrition, total parenteral nutrition, excessive consumption of raw egg whites, prolonged antibiotic use altering the gut microbiota, and associated with various medications including valproic acid and isotretinoin. Inherited deficiencies are due to a genetic mutation in either biotinidase or holocarboxylase, both involved in the biotin cycle.

Overall, existing low-grade evidence only supports that biotin may improve hair growth or quality in the following settings: uncombable hair syndrome, short anagen syndrome, biotinidase and holocarboxylase deficiency, insufficient biotin intake (formula, parenteral nutrition, and surgical bowel resection), and medications (isotretinoin and valproic acid). No studies have demonstrated biotin supplementation to be beneficial for hair growth in healthy individuals.

Biotin toxicity is essentially unheard of; however, biotin supplementation does not come without risk. Elevated serum biotin levels can interact with various laboratory immunoassays that could lead to a missed diagnosis, needless workups, undue distress, or fatal consequences, for example, myocardial infarction being missed out. Many immunoassays rely on a streptavidin-biotin interaction. Interference from excess serum biotin may induce both false-positive and false-negative laboratory results based on the assay design. Cessation of

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biotin therapy is recommended at least two days before blood tests, and up to a week may be needed for high-dose therapy, especially for sensitive tests. Clinicians can institute many safeguards to prevent the unwanted implications of biotin laboratory interference. Increased

public and physician awareness will help mitigate potential errors.

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