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Comment on the Use of Biotin for Hair Loss

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Knowledge is in the end based on acknowledgement.
Ludwig Wittgenstein (1889–1951)

Dear Editor,

I read with interest “A review of the use of biotin for hair loss” by Patel et al. [1]. The authors are to be commended for their intention to clarify whether there is medical evidence for the current practice of treating hair loss in otherwise healthy individuals with oral biotin.

“Let food be your medicine” is a saying attributed to the Greek physician Hippocrates of Kos (circa 460–370 BC), who is also referred to as the “Father of Modern Medicine” in recognition of his contributions to the science and practice of diagnosis, treatment, and prevention of diseases [2]. Above all, Hippocrates revolutionized medicine by distinguishing it as an independent discipline from the practice of magical rituals in the art of healing, and ultimately establishing it as a scientific profession. And yet, there is hardly another field with so much prejudice, misconception, and debate as diet and health. Accordingly, Jerome Groopman [3] from Harvard Medical School states in his book *How Doctors Think*, with a focus on thinking errors in medicine, that “aside from relatively common dietary deficiencies – lack of vitamin B12 causing pernicious anaemia, or insufficient vitamin C giving rise to scurvy – little is known about the effects of nutrition on many bodily functions”.

Our current knowledge about the effect of nutrition on body functions stems from observations on rare forms of inborn errors of metabolism involving amino acids, trace metals, and vitamins, general malnutrition and specific deficiency disorders, and the results of respective supplementation studies both in animals and in humans.

Due to its availability, affordability, and effective marketing for this purpose, biotin has been a popular nutritional supplement for treatment of hair loss, despite a lack of data on the frequency of biotin deficiency in patients complaining of hair loss, and on the value of oral biotin for treatment of hair loss that is not due to one of the rare inborn errors of biotin metabolism or biotin deficiency. Finally, biotin deficiency is generally believed to be rare, because intestinal bacteria produce biotin in excess of the body’s daily re-

quirements, and biotin is consumed from a wide range of food sources. The first demonstration of acquired biotin deficiency in animals was observed in rats fed raw egg white [4], due to a glycoprotein found in egg white, avidin, which binds extremely well with biotin, making it unavailable for use in enzymatic reactions.

Ultimately, Patel et al. [1] conducted a PubMed search of case reports and randomized clinical trials with biotin supplementation with the aim of systematically reviewing the literature on biotin efficacy for disorders of hair and nail growth. They found 18 reports on improvement in hair and nail growth following supplementation in patients with established biotin deficiency; however, they propose that these cases are uncommon, and therefore there is a lack of evidence for biotin supplementation in healthy individuals. They claim that there are currently no studies that show biotin deficiencies in healthy human individuals with balanced diets, and despite recognition of one recent study demonstrating a frequency of 38% biotin deficiency (<100 ng/L) in a collective of 541 women complaining of hair loss [5], they dismiss this finding as confounded by multiple factors, including a patient history of use of antibiotics, antiepileptics, isotretinoin, or gastrointestinal disease in 11%, and coexisting seborrheic dermatitis in 35% suggesting a multifactorial cause for the hair loss.

While the frequency of biotin deficiency in the general population has not yet been established, it is remarkable that biotin levels were found to be deficient (<100 ng/L) in 38% and marginal (between 100 and 400 ng/L) in 49% of women complaining of hair loss [5], whatever the causes may be. It is regretful that Patel et al. [1] did not acknowledge and reiterate the recommendations regarding biotin for women with hair loss from the respective publication [5]: “In view of the frequency of biotin deficiency in women complaining of hair loss, a careful patient history and clinical examination with respect to risk factors for biotin deficiency (gastrointestinal disease, medication with isotretinoin, antibiotics, or antiepileptics) and associated symptoms of biotin deficiency (seborrheic-like dermatitis, neurological symptoms) must be performed. When biotin deficiency is suspected, the serum biotin level must be determined, and in case of biotin deficiency (<100 ng/L), the cause must be sought (unless obvious from the patient history) and treated. Regardless of the cause, biotin deficiency is successfully treated with nutritional supplementation with a usually high bioavailability of oral biotin in a dosage of 5 mg/day. At the same time, potential additional causes of hair loss, such as androgenetic alopecia, other nutritional deficiencies, and endocrine disorders, must be systematically addressed and treated as well.”

I totally agree with Patel et al. [1] that the custom of treating hair loss in an indiscriminate manner with oral biotin supplementation is to be rejected, and that there is a need for randomized controlled studies to validate the additional benefit of biotin supplementation in individuals with hair loss of multifactorial origin with biotin deficiency or marginal biotin levels.

Statement of Ethics

There are no ethical conflicts to disclose.

Disclosure Statement

The original study on serum biotin levels in women complaining of hair loss [5] was performed with support of Merz Pharma (Schweiz) AG.

References

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