Sir,

Selenium is an essential oligo-element for the human body, obtained from food of vegetable or animal origin. Its average consumption differs significantly among countries, and in Brazil, the recommended dietary allowance is 34 mcg/day for adults.[1] Reference values for serum selenium concentration are controversial and range approximately from 46 to 143 mcg/L. Most part of the selenium ingested is absorbed in the duodenum and then converted by the liver in selenocysteine, an amino acid used in the biosynthesis of selenoproteins, enzymes with antioxidant properties.[2] Moreover, selenium seems to prevent the production of immunosuppressive cytokines, thus increasing both cellular and humoral immunity.[3] Accordingly, a few systematic reviews have associated adequate selenium levels to the prevention of some types of cancer, cardiovascular, and autoimmune diseases. Nevertheless, other studies did not show any benefits of selenium supplements, suggesting they may even lead to numerous side effects including nonscarring alopecias. Selenosis may occur when selenium’s daily intake is higher than 400 mcg. In this case, arthralgia, fatigue, headache, nausea, vomiting, diarrhea and telogen effluvium have been reported. There are no known antidotes for the intoxication, but high serum levels reverse from 6 weeks of suspending the ingestion.

Studies in murine models have demonstrated that about 10–15 selenoproteins exist in the skin and that their depletion leads to the development of hyperplastic epidermis and aberrant morphogenesis of hair follicles. Some mice submitted to selenium-restrictive diet developed poliosis and mild telogen effluvium, while an intense telogen effluvium was observed in those with excessive selenium. A regular diet caused no clinical abnormalities. Selenium levels imbalance could function as a triggering factor for an organic oxidative stress, inducing mitochondrial membrane apoptosis, which leads to hair cycle impairment and telogen effluvium.[4] It has also been reported that newborns on parenteral nutrition with too little selenium developed delayed growth, dyschromias such as pseudoalbinism and telogen effluvium more often; all of them reversible with adequate supplementation.

An Iranian study has compared patients with several degrees of alopecia areata to a control group and observed significantly lower serum selenium levels in the first group though there was no statistical difference among cases.[5] In our own records, 40 patients with alopecia areata were evaluated with serum selenium dosage, and there was no statistically significant difference between them and a control group.

Nowadays, when miraculously promising diets and supplements containing selenium are many times taken indiscriminately, selenosis must be remembered in case of telogen effluvium with fatigue, diarrhea, arthralgia, headache, and nausea. Hyperseleinemia can also be found in refractory effluviums while hyposeleinemia may be present in total parenteral nutrition or short-bowel syndrome patients. On the other hand, there is no consistent data to sustain the association between alopecia areata and serum selenium levels. Therefore, physicians need to share their experiences and data, focusing on better criteria for requesting selenium tests, thus reducing unnecessary expenses and treatments based exclusively on laboratory values.

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Conflicts of interest

There are no conflicts of interest.

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