

## Should We Be Prescribing Iron to Patients for Reasons other than Iron Deficiency?

In this issue, we have a synthesis article by Emeritus Professor, Dr. William Ware, about serum ferritin levels and the risk of diseases and conditions such as type-2 diabetes mellitus, coronary heart disease, non-alcoholic fatty liver disease, hypertension, and even oxidative stress. Dr. Ware summarizes lots of studies and makes a great case for lowering the “normal” reference ranges of serum ferritin to ranges well below the upper limit of normal for males and females.

The evidence he summarizes is so convincing that I wonder what we, as an orthomolecular collective, should do in situations (other than, for example, the treatment of iron-deficiency anaemia) where there might be therapeutic benefits from iron supplementation? Such examples include alopecia in women, attention deficit hyperactivity disorder (ADHD), and restless leg syndrome (RLS). The short-term clinical benefits might be less desirable than the possible increased risks of future harm resulting from increasing serum ferritin levels.

### Alopecia in Women

The observation that low serum ferritin stores might be associated with alopecia in women was first reported in 1963<sup>1</sup>, and more recently by Rushton in 1993.<sup>2</sup> In 2002, Rushton published more data on this topic and reported on 200 women with chronic telogen effluvium (i.e., persistent hair shedding lasting longer than 6 months).<sup>3</sup> The mean ferritin level ( $36.8 \pm 24.4$  ng/mL) was below 70 ng/mL in 96% of the 200 patients (i.e., 192 patients). This is an important finding since Rushton reported that the ferritin level required to prevent hair from shedding should be greater than or equal to 70 ng/mL with a normal erythrocyte sedimentation rate.<sup>3</sup> Clinical data has also shown supplemental iron to benefit hair loss. In a study involving 22 female patients with chronic telogen effluvium, daily use of 72 mg of elemental iron

in combination with 1,500 mg of L-lysine for six months resulted in a significant decrease in the percentage of hair in the telogen phase.<sup>4</sup> The mean percentage of hair shedding decreased by 39% ( $p < 0.0001$ ), and there was a significant increase in the mean ferritin level ( $p < 0.0001$ ). Iron is believed to help in hair growth since it is a cofactor for ribonucleotide reductase, the rate-limiting enzyme for DNA synthesis.<sup>5</sup> Thus, serum ferritin levels less than 70 ng/mL might adversely affect hair growth by affecting the proper functioning of this enzyme, and therefore inhibiting proliferation.

### ADHD and RLS

Several studies suggest beneficial effects upon ADHD symptoms from iron supplementation. A study published in 1997 involved boys aged 7-11 years who were given an iron supplement even though they were not anaemic.<sup>6</sup> The study group consisted of 14 boys who were provided with an iron preparation (Ferrocal 5 mg/kg/day) for 30 days. The results showed improvements per the Conners' Parent Rating Scale (from  $17.6 \pm 4.5$  to  $12.7 \pm 5.4$ ), and significant increases in their serum ferritin levels (from  $25.9 \pm 9.2$  to  $44.6 \pm 18$  ng/mL). It is possible that these boys required higher-than-normal amounts of iron in order for their dopaminergic systems to function adequately.

In 2004, a larger study assessed ferritin levels and ADHD symptoms in 53 children with ADHD (age 4-14 years) and 27 controls (mean age  $9.5 \pm 2.8$  years).<sup>7</sup> The mean serum ferritin levels were lower in the ADHD children ( $23 \pm 13$  ng/mL) compared to the controls ( $44 \pm 22$  ng/mL), and these differences were statistically significant ( $p < 0.001$ ). In 84% of the ADHD children their serum ferritin levels were below 30 ng/mL compared to only 18% of controls. These differences were also statistically significant ( $p < 0.001$ ). Low serum ferritin levels were also correlated to severe general ADHD symptoms and cognitive deficits. It was concluded that low ferritin levels play a role in the development of ADHD, and iron supplementation might benefit children having this disorder.

A 2007 study assessed the impact of RLS

and iron deficiency upon ADHD in children, postulating that iron deficiency might play a role in the development of both ADHD and RLS.<sup>8</sup> Children with both ADHD and RLS had more severe ADHD symptoms than did children having only ADHD. In addition, the mean serum ferritin levels were significantly lower in the ADHD children than the control group ( $p < 0.0005$ ). The serum ferritin levels exhibited more of a downward trend among the ADHD and RLS children compared to the children having ADHD only. The results showed that children with ADHD and a positive family history of RLS are a group at greater risk for severe ADHD symptoms. More recently, in a robust review of iron's role in pediatric RLS, the consensus was to consider 3-6 mg of elemental iron/kg/day as a therapeutic treatment for 3 months if baseline ferritin levels were lower than 50 ng/mL in the absence of iron metabolism disorders.<sup>9</sup>

With respect to adults with RLS, the results of a randomized controlled trial showed symptom-lowering benefits from oral iron supplementation among patients with low-normal ferritin levels.<sup>10</sup> After 12 weeks of iron supplementation, ferritin levels increased while symptoms of RLS decreased. In a 2012 review, it was determined that adult patients with RLS and low ferritin levels should be offered iron supplementation as a treatment option.<sup>11</sup>

### Where Do We Go from Here?

Given the morbidity and mortality associated with the diseases and disorders Dr. Ware highlights in this issue as being affected by "normal" serum ferritin levels (i.e., levels within reference ranges defined by licensed medical laboratories), I believe caution is warranted when providing iron supplementation to patients for therapeutic reasons not involving iron-deficiency anaemia. There are patients, however, that might wish to either try iron supplementation as an alternative to pharmaceutical drugs, or might prefer a more "natural" approach for their medical problems, such as alopecia in women, ADHD, and/or RLS. Patients should give valid consent prior to accepting iron supplementation for therapeutic reasons, and should be told that in-

creasing serum ferritin levels might adversely impact their future health status.



—Jonathan E. Prousky, ND, MSc  
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This issue also features an original study from Dr. Momčilović and colleagues in Croatia about iodine assessment from human hair. Given the fact that that many clinicians prescribe iodine therapeutically, perhaps hair should be used to assess whether or not a patient is deficient.