

Iron Supplementation May Reduce Tic Severity in Tourette's

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BERLIN — Iron supplementation may reduce tic severity in children with Tourette's syndrome (TS), whether the children are iron deficient or not, a preliminary research shows.

Speaking at a poster session here at the 20th International Congress of Parkinson's Disease and Movement Disorders, Debabrata Ghosh, MD, associate professor of clinical pediatrics and neurology at Ohio State University College of Medicine in Columbus, described his analysis of patient records (n = 57) at the Nationwide Children's Hospital, where he is an attending pediatric neurologist.

The analysis included the charts of all consecutive patients younger than 18 years old with a confirmed TS diagnosis between 2009 and 2015 with a record of serum ferritin testing.

The ratio of male to female patients was 2:1, with a mean age at initial visit of 9.6 ± 2.9 years. Comorbidities included obsessive-compulsive disorder (OCD, 37%), attention-deficit/hyperactivity disorder (ADHD, 44%), and anxiety (49%).

Tic severity and impact on life were graded by using the Modified Yale Global Tic Severity Scale (YGTSS) on a scale of 1 (mild) to 5 (severe) for each component. Among the cohort, tic severity was moderate (mean, 2.3 ± 0.8), as was impact on life (mean, 2.2 ± 0.9). The mean composite score was 4.6 ± 1.6 . The mean ferritin level was 48.0 ± 33.3 ng/mL (range, 12.0 - 172.0 ng/mL). A serum ferritin less than 50 ng/mL was considered low.

Patients with low serum ferritin levels were more likely to have tic composite scores in the "severe" range than were patients with normal levels (a prevalence of 38% vs 25%, respectively). However, these differences were not statistically significant, probably because of the limited sample size.

Table. Relation of Ferritin Levels to Tic Composite Score^a

Ferritin Level	Mild-Moderate Tic (n = 38), n (%)	Severe Tic (n = 19), n (%)
Low (≤ 50 ng/mL) (n = 37)	23 (62)	14 (38)
Normal (> 50 ng/mL) (n = 20)	15 (75)	5 (25)

^aTic composite score: mild-moderate, 5 or less; severe, greater than 5.

When patients received iron supplementation of 3 to 5 mg/kg/day for 3 to 6 months, "both iron-deficient and iron-sufficient benefited," Dr. Ghosh told *Medscape Medical News*. "The ones who were iron deficient and did not get any therapy, they got much worse."

At 12 months, for iron-deficient patients who did not get supplementation (n = 7), tic severity increased to 2.70 from a baseline of 2.36. Patients who received iron (n = 5) showed a decrease in tic severity from 2.70 to 1.90.

For patients who started with sufficient iron levels and received iron (n = 10), their scores decreased to 1.95 from 2.40. Without supplementation (n = 4), the score remained at 2.88.

Comorbidities of OCD, ADHD, or anxiety did not correlate with serum ferritin levels.

Dr Ghosh noted that iron is required for nerve myelination and affects the sensitivity of dopamine D₂ receptors. Iron deficiency has been shown to be etiologic for restless legs syndrome (RLS), with a reduction in severity of the condition upon correction of the deficiency. He therefore reasoned that tics may be hyperkinetic movements similar to RLS, and "serum iron may underlie tics in Tourette syndrome," he said.

He suggested that a larger, prospective, double-blind study should be done to investigate more formally the relation between serum ferritin levels and tic severity and to evaluate the response to iron supplementation on tics and other aspects of TS. He said he is planning such a trial.

Limitations of the study are its retrospective nature, small sample size, confounding factors, and a lack of full data to complete the YGTSS.

Poster session moderator Ron Postuma, MD, MSc, associate professor of neurology and neurosurgery in the faculty of medicine at McGill University in Montreal, Canada, commented to *Medscape Medical News* that even though the study is preliminary and the effects are "clinically modest," it is interesting and it makes sense "maybe if you're having bad tics to check the ferritin and make sure the person is not iron deficient."

He said serum ferritin is probably the most accurate way to assess iron status. However, inflammatory conditions can elevate ferritin levels because ferritin is an acute phase reactant, possibly leading a clinician to miss a case of iron deficiency. On the other hand, a low value would in most cases indicate true iron deficiency.

Dr Ghosh and Dr Postuma have disclosed no relevant financial relationships.

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