Attention-deficit/hyperactivity disorder, iron deficiency, and obesity: Is there a link?

Cortese S, Angriman M.

Abstract
The exact etiopathophysiology of attention-deficit/hyperactivity disorder (ADHD) remains elusive, likely because of its phenotypic heterogeneity. Given the involvement of iron in neurocognitive and behavioral functions, iron deficiency (ID) has been suggested as a possible etiopathophysiological factor in a subsample of individuals with ADHD. Most studies assessing ID in ADHD have focused on serum ferritin, a marker of peripheral iron status. Results from these studies are mixed, and the largest studies failed to find a significant association between ADHD and low serum ferritin levels. However, serum ferritin may be influenced by several conditions, including inflammatory status. Increasing evidence, especially from epidemiological studies, points to a significant association between ADHD and obesity. Interestingly, obesity is associated with a chronic inflammatory status, characterized by ID with normal-to-high serum ferritin levels. This article reviews the literature on iron status in ADHD and on the relationship between ADHD and obesity; discusses a possible link among ADHD, ID, and obesity; and proposes that comorbid obesity contributes to ID, via chronic inflammation, in a subsample of individuals with ADHD. Thus, the comorbidity between ADHD and obesity suggests moving beyond serum ferritin levels and assessing the molecular pathways of chronic inflammation that lead to ID in individuals with ADHD and obesity. In turns, this may pave the way for novel treatment strategies for cognitive and behavioral dysfunctions related to ID in ADHD.