Higher prevalence of iron deficiency as strong predictor of attention deficit hyperactivity disorder in children

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Background: It has been reported that ferritin and iron deficiency may be related to the pathophysiology of attention deficit hyperactivity disorder (ADHD).

Aim: The aim of this study was to determine the association between iron deficiency and ADHD and the impact and role of iron deficiency on the development of ADHD in children.

Subjects and Methods: The study based on the case-control study age- and sex-matched control and conducted at the School Health and Primary Healthcare Clinics, Qatar. A total of 630 children with ADHD aged 5-18 and 630 controls aged 5-18 years old. Sociodemographic and clinical data were collected, including physician diagnosis. The health status of the subjects was assessed by ascertaining clinical presentations and symptoms, family history, body mass index (BMI), iron deficiency, ferritin, serum 25-hydroxyvitamin D, calcium, magnesium, and phosphorus levels. Descriptive, univariate, and multivariate statistical analysis were performed.

Results: Mean age (standard deviation [SD] in years) for ADHD and control children were 11.54 (3.83) versus 11.50 (3.62). There were statistically significant differences between ADHD versus control children for vitamin D [16.81 (7.84) vs. 22.18 (9.00) ng/ml], serum iron [82.11 (13.61) vs. 85.60 (12.47) ng/ml], ferritin [36.26 (5.93) vs. 38.19 (5.61) ng/ml], hemoglobin [12.02 (2.13) vs. 12.89 (2.02) g/dL], magnesium [0.82 (0.08) vs. 0.88 (0.06) mmol/L], serum calcium level [2.35 (0.12) vs. 2.39 (0.14) mmol/L], and phosphorous [1.47 (0.30) vs. 1.54 (0.26) mmol/L]. Of total 630 of ADHD children, 116 (18.4%) had severe vitamin D deficiency (<10 ng/ml). Multivariate logistic regression analysis revealed that serum vitamin D level, serum iron, ferritin, serum calcium level, physical activity, nervous behavior, consanguinity, BMI, and child order were considered as the main factors associated with the ADHD after adjusting for age, gender, and other variables.

Conclusion: The study indicates that low serum iron, ferritin levels, and vitamin D deficiency may be associated with ADHD.