Attention-deficit/hyperactivity disorder is associated with reduced levels of serum low-density lipoprotein cholesterol in adolescents. Data from the population-based German KiGGS study.


Abstract

OBJECTIVES:
Attention-deficit/hyperactivity disorder (ADHD) is a multifactorial, complex and the most common neurodevelopmental disorder in childhood. In this analysis, we tested the hypothesis that altered serum lipid patterns are associated with ADHD.

METHODS:
Using data from the nationwide, population-based German Health Interview and Examination Survey for Children and Adolescents (KiGGS), we compared serum levels of total cholesterol, high-density (HDL) and low-density lipoprotein (LDL) cholesterol, and also triglycerides, in participants with physician-diagnosed and/or suspected ADHD, as defined by a value of ≥7 on the hyperactivity-inattention subscale of the Strengths and Difficulties Questionnaire (SDQ), with non-ADHD controls.

RESULTS:
Among 6,898 participants aged between 11 and 17 years, 666 (9.7%) had a physician-based diagnosis of ADHD and/or suspected ADHD. We found correlations between the parent-rated SDQ scores on the hyperactivity-inattention subscale and concentrations of triglycerides ($r = 0.064$, $p < 0.001$), total cholesterol ($r = -0.026$, $p = 0.033$), HDL cholesterol ($r = -0.059$, $p < 0.001$) and LDL cholesterol ($r = -0.027$, $p = 0.031$). In multivariate models, low serum levels of LDL cholesterol remained a significant predictor of ADHD ($\text{Exp}(\beta) = 0.382$, 95% confidence interval = 0.165-0.888, $p = 0.025$).

CONCLUSIONS:
Our findings in a large, nationwide and representative sample of German adolescents demonstrated a small, but significant and inverse link between LDL cholesterol levels and symptoms of ADHD. Further studies are required to decipher the biochemical mechanisms behind this relationship.