The effect of methylphenidate intake on brain structure in adults with ADHD in a placebo-controlled randomized trial.


Abstract

BACKGROUND:
Based on animal research several authors have warned that the application of methylphenidate, the first-line drug for the treatment of attention-deficit/hyperactivity disorder (ADHD), might have neurotoxic effects potentially harming the brain. We investigated whether methylphenidate application, over a 1-year period, results in cerebral volume decrease.

METHODS:
We acquired structural MRIs in a double-blind study comparing methylphenidate to placebo. Global and regional brain volumes were analyzed at baseline, after 3 months and after 12 months using diffeomorphic anatomic registration through exponentiated lie algebra.

RESULTS:
We included 131 adult patients with ADHD into the baseline sample, 98 into the 3-month sample (54 in the methylphenidate cohort and 44 in the placebo cohort) and 76 into the 1-year sample (37 in the methylphenidate cohort and 29 in the placebo cohort). Methylphenidate intake compared with placebo did not lead to any detectable cerebral volume loss; there was a trend toward bilateral cerebellar grey matter increase.

LIMITATIONS:
Detecting possible neurotoxic effects of methylphenidate might require a longer observation period.

CONCLUSION:
There is no evidence of grey matter volume loss after 1 year of methylphenidate treatment in adult patients with ADHD.