


Abstract

Long-term effects of psychostimulants such as methylphenidate on ADHD patients have been proved to be difficult to capture in cross-sectional studies comparing medicated and non-medicated samples and in longitudinal studies with children, with age-related maturational processes possibly confounding independent effects of medication. However, chronic psychostimulant administration at therapeutic doses has been proven to yield profound neuroadaptive changes in rodent models. Here, we present for the first time the effect of psychostimulant treatment on brain volumes in a sample of medication-naïve adult ADHD patients. We investigated grey matter volume changes in a sample of 41 medication-naïve adult ADHD patients before and after three years of psychostimulant treatment (N = 25) or no treatment (N = 16) compared to healthy adults (N = 25). We found a significant group x time interaction effect on left putamen grey matter volumes, with a decrease in left putamen volumes in the non-medicated group compared to both the medicated group and controls, and no differences between the medicated group and controls. Our results suggest a normalizing effect of psychostimulant treatment on the left putamen volume loss detected in non-medicated ADHD patients.