

Visuospatial working memory assessment using a digital tablet in adolescents with attention deficit hyperactivity disorder.

Hyun GJ, Park JW, Kim JH, Min KJ, Lee YS, Kim SM, Han DH.

Comput Methods Programs Biomed. 2018 Apr;157:137-143.

doi: 10.1016/j.cmpb.2018.01.022.

Abstract

BACKGROUND AND OBJECTIVE:

Attention-deficit hyperactivity disorder (ADHD) is a neurodevelopmental disorder hypothesized to involve impaired visuospatial working memory (VSWM). However, there are few studies utilizing neuropsychological tests to measure VSWM in ADHD adolescents. The Rey-Osterrieth complex figure test (ROCF) is commonly used as a neuropsychological test to assess visuospatial working memory for individuals with ADHD. We assessed working memory using the ROCF test on a digital Galaxy tablet with the technically new Gaussian filter method.

METHODS:

Thirty adolescents with ADHD and 30 healthy control adolescents were recruited for participation in the current study. All adolescents were assessed with K-WISC-IV, Children's depression inventory, and the Korean ADHD rating scale. All adolescents were asked to copy the ROCF from paper onto a Galaxy tablet screen using a wireless pen.

RESULTS:

There was a significant difference in representative value of the deviation of the original images from template images (R-value) in copy and delayed recall between ADHD adolescents and healthy adolescents. There was no significant difference in R-value of immediate recall between ADHD adolescents and healthy adolescents. In all adolescents (ADHD and healthy) and ADHD adolescents, the R-value of copy was negatively correlated with visuospatial index and working memory index, and the R-value of delayed recall was negatively correlated with WMI. The R-value of copy and delayed recall was positively correlated with K-ARS in all adolescents and ADHD adolescents.

CONCLUSIONS:

ADHD adolescents showed differences in the R-values of copy and delayed recall in the digital ROCF version compared to healthy adolescents. The digital ROCF assessment tool can represent different patterns of visuospatial working memory abilities in ADHD adolescents compared to healthy adolescents.