Comparison of baseline and post-concussion ImPACT test scores in young athletes with stimulant-treated and untreated ADHD.

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Abstract

OBJECTIVES:
Baseline and post-concussion neurocognitive testing is useful in managing concussed athletes. Attention deficit hyperactivity disorder (ADHD) and stimulant medications are recognized as potential modifiers of performance on neurocognitive testing by the Concussion in Sport Group. Our goal was to assess whether individuals with ADHD perform differently on post-concussion testing and if this difference is related to the use of stimulants.

METHODS:
Retrospective case-control study in which 4373 athletes underwent baseline and post-concussion testing using the ImPACT battery. 277 athletes self-reported a history of ADHD, of which, 206 reported no stimulant treatment and 69 reported stimulant treatment. Each group was matched with participants reporting no history of ADHD or stimulant use on several biopsychosocial characteristics. Non-parametric tests were used to assess ImPACT composite score differences between groups.

RESULTS:
Participants with ADHD had worse verbal memory, visual memory, visual motor speed, and reaction time scores than matched controls at baseline and post-concussion, all with p ≤ .001 and |r| ≥ 0.100. Athletes without stimulant treatment had lower verbal memory, visual memory, visual motor speed, and reaction time scores than controls at baseline (p ≤ .01, |r| ≥ 0.100 [except verbal memory, r = -0.088]) and post-concussion (p = 0.000, |r| > 0.100). Athletes with stimulant treatment had lower verbal memory (Baseline: p = 0.047, r = -0.108; Post-concussion: p = 0.023, r = -0.124) and visual memory scores (Baseline: p = 0.013, r = -0.134; Post-concussion: p = 0.003, r = -0.162) but equivalent visual motor speed and reaction time scores versus controls at baseline and post-concussion.

CONCLUSIONS:
ADHD-specific baseline and post-concussion neuropsychological profiles, as well as stimulant medication status, may need to be considered when interpreting ImPACT test results. Further investigation into the effects of ADHD and stimulant use on recovery from sport-related concussion (SRC) is warranted.