

Running Head: AGE-OF-ONSET OF ADHD SYMPTOMS

Cognitive variables distinguish ADHD subgroups defined by age-of-onset of symptoms: Preliminary
evidence from an adolescent sample

Julia J. Rucklidge

Rosemary Tannock

Brain and Behaviour Research, The Hospital for Sick Children, Toronto, Canada

Although there is an explicit age-of-onset requirement for a complete diagnosis of ADHD, some researchers have argued that the need to demonstrate evidence of impairment from symptoms before the age of seven may be too restrictive (Barkley and Biederman, 1997) and may not be valid diagnostically (Applegate et al., 1997). These authors argue that because the age-of-onset has not been empirically validated, it should be broadened.

This letter examines the clinical significance of the age-of-onset criterion by presenting some preliminary work that compared cognitive functioning in four groups of adolescents (13-16 years), matched for age, IQ and gender: 1) six with adolescent-onset ADHD (ADHD present but not past); 2) six with childhood-onset, persisting ADHD (ADHD past and present); 3) six with ADHD in remission (ADHD past but not present); and 4) six non-ADHD controls (no ADHD past or present). There were four females and two males in each group. This sample represents a subset of a cohort of 123 adolescents who participated in an adolescent study investigating gender differences in ADHD. A systematic and comprehensive diagnostic assessment for ADHD (details provided in Rucklidge and Tannock, 2001), revealed that a number of participants either met criteria for ADHD when younger but no longer met current criteria or met criteria for current symptoms but showed no evidence of symptoms when younger. These adolescents were excluded from our previous study (Rucklidge and Tannock, 2001). All participants completed the WISC-III, WRAT3, tests of Rapid Automated Naming, the Stroop Color and Word test and the Stop-Signal Task. Participants who were receiving psychostimulant medication discontinued 24 hours before the day of testing.

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Planned orthogonal contrasts were performed to investigate group differences: the childhood-onset ADHD group was compared with the adolescent-onset group, the remitted group was compared with the childhood-onset and adolescent-onset groups (i.e., those meeting diagnostic criteria currently), and the three clinical groups were compared with the controls. These comparisons tested whether age-of-onset and persistence of symptoms are important variables to consider in the diagnosis of ADHD.

Given the low power to detect group differences, $p < .1$ was used as the level to make comments on group differences. Effect sizes were also calculated.

Not surprisingly, all three clinical groups differed from the controls: they exhibited slower processing speed, more variability in response times as measured by the Stop task, and slower naming in the color/word subtest of the Stroop. Effect sizes ranged from small to medium on these tasks (.27 - .53). The ADHD-in-remission group did not differ from those adolescents currently exhibiting symptoms of ADHD (childhood-onset and adolescent-onset ADHD groups), suggesting that individuals with ADHD-in-remission may still have similar cognitive deficits to those with current ADHD symptoms without the accompanying behavioural problems. In other words, even though the behavioral symptoms have subsided (perhaps as a consequence of behavioral and pharmacological treatments), the underlying cognitive difficulties are still evident. The effect sizes supported this lack of group differences (.08 - .34).

Intriguingly, adolescents with childhood-onset ADHD were slower in processing speed (Symbol Search), color and number naming, and were more variable in response times and accuracy of responses (as measured by the Stop Task) as compared with the adolescent-onset ADHD group. Overall, effect sizes were medium (.34 - .53). The deficits documented in the childhood-onset group may prove to be impairments only evident in those individuals with longstanding ADHD symptoms, suggesting that the age-of-onset may be an important distinguishing feature.

This brief report presents intriguing data based on a very small sample. As such, interpretations are limited by the lack of power available to detect group differences. However, given the difficulty in recruiting such a sample, the data are important in helping us further our knowledge of the underlying cognitive deficits that may be inherent in children with longstanding and persistent ADHD symptoms. These preliminary results lend some support to the current clinical requirement of strictly observing the age-of-onset criterion. It is possible that those adolescents who evidence ADHD symptoms in adolescence only may not actually have ADHD, they simply manifest “ADHD-like” symptoms that can

best be explained by another Axis I disorder and not ADHD (e.g., Rucklidge & Tannock, 2000). It is hoped that the results prompt researchers and clinicians to consider the age at which ADHD symptoms first appeared when considering a diagnosis of ADHD in adolescents. Further research is required with larger samples and samples with more males to replicate and extend these preliminary findings.

Julia J. Rucklidge, Ph.D.
University of Canterbury
Christchurch, New Zealand

Rosemary Tannock, Ph.D.
The Hospital for Sick Children
Toronto, Canada

References

- Applegate B, Lahey B, Hart E, Biederman J, Hynd G, Barkley R, Ollendick T, Frick P, Greenhill L, McBurnett K, Newcorn J, Kerdyk L, Garfinkel B, Waldman I, Shaffer D (1997), Validity of the age-of-onset criterion for ADHD: A report from the DSM-IV field trials. *J Am Acad Child Adolesc Psychiatry* 36:1211-1221
- Barkley RA (1997), Behavioral inhibition, sustained attention, and executive functions: Constructing a unifying theory of ADHD. *Psychol Bull* 121:65-94
- Barkley RA, Biederman J (1997), Toward a broader definition of the age-of-onset criterion for Attention-Deficit/Hyperactivity Disorder. *J Am Acad Child Adolesc Psychiatry* 36:1204-1210
- Rucklidge JJ, Tannock R (2001), Psychiatric, Psychosocial and Cognitive Functioning of Female Adolescents with ADHD. *J Am Acad Child Adolesc Psychiatry* 40, 530-540
- Rucklidge JJ, Tannock R (2000), Apparent adolescent onset of ADHD – Beware! *J Am Acad Child Adolesc Psychiatry* 39:1075-1076