Revisiting the co-existence of Attention-Deficit/Hyperactivity Disorder and Chronic Tic Disorder in the childhood-The case of color discrimination, sustained attention and interference control.


Abstract

OBJECTIVE:
Attention Deficit / Hyperactivity Disorder (ADHD) and Chronic Tic Disorder (CTD) are two common and frequently co-existing disorders, probably following an additive model. But this is not yet clear for the basic sensory function of color processing sensitive to dopaminergic functioning in the retina and higher cognitive functions like attention and interference control. The latter two reflect important aspects for psychoeducation and behavioral treatment approaches.

METHODS:
Colour discrimination using the Farnsworth-Munsell 100-hue Test, sustained attention during the Frankfurt Attention Inventory (FAIR), and interference liability during Colour- and Counting-Stroop-Tests were assessed to further clarify the cognitive profile of the co-existence of ADHD and CTD. Altogether 69 children were classified into four groups: ADHD (N = 14), CTD (N = 20), ADHD+CTD (N = 20) and healthy Controls (N = 15) and compared in cognitive functioning in a 2×2-factorial statistical model.

RESULTS:
Difficulties with color discrimination were associated with both ADHD and CTD factors following an additive model, but in ADHD these difficulties tended to be more pronounced on the blue-yellow axis. Attention problems were characteristic for ADHD but not CTD. Interference load was significant in both Colour- and Counting-Stroop-Tests and unrelated to color discrimination. Compared to Controls, interference load in the Colour-Stroop was higher in pure ADHD and in pure CTD, but not in ADHD+CTD, following a sub-additive model. In contrast, interference load in the Counting-Stroop did not reveal ADHD or CTD effects.

CONCLUSION:
The co-existence of ADHD and CTD is characterized by additive as well as sub-additive performance impairments, suggesting that their co-existence may show simple additive characteristics of both disorders or a more complex interaction, depending on demand. The equivocal findings on interference control may indicate the limited validity of the Stroop-Paradigm for clinical assessments.