

Adult Individuals with Classic Congenital Adrenal Hyperplasia Exhibit Deficits in Executive Functions

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Introduction

Individuals with Congenital Adrenal hyperplasia (CAH) require life-long glucocorticoid (GC) treatment. Many studies suggest that GC excess may have negative effects on cognition.

Objective

The aim was to investigate cognitive functions in adult individuals with CAH.

Methods

We evaluated cognitive functions in 46 individuals with CAH (mean age=24.4, sd=4.9) and 58 population controls (mean age=20.7, sd 2.8).

Subtests from the Wechsler Adult Intelligence Scale (WAIS-IV) as well as from the Wechsler Memory Scale (WMS-III) were used to assess verbal and non-verbal intelligence, verbal working memory, spatial working memory, coding and long term memory. In addition, the Stroop task was used for estimation of processing speed.

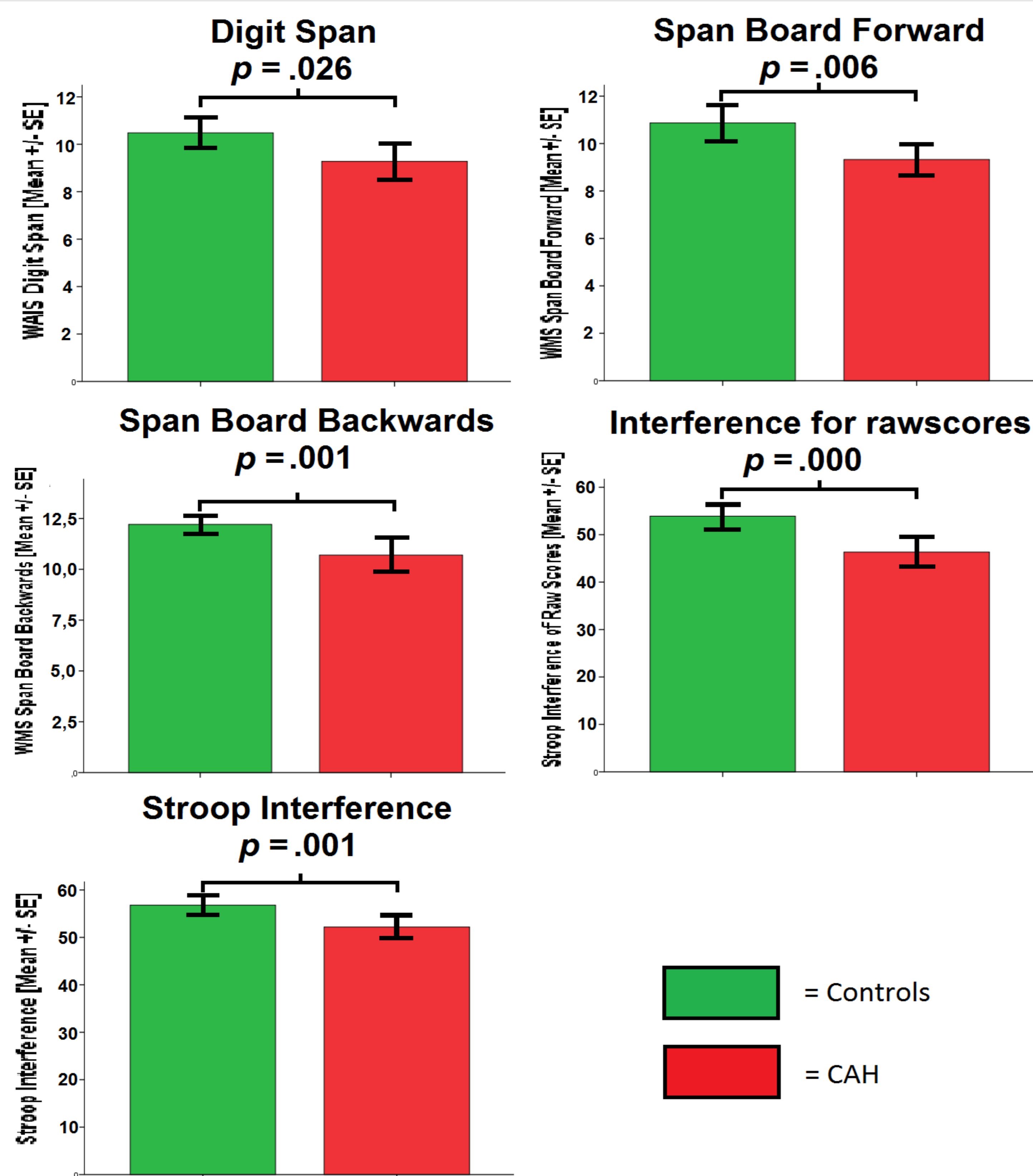


Figure 1. Mean test scores for WAIS – Digit Span, WMS – Span Board (forward and backwards) and Stroop interference test with acquired *p*-values.

Conclusions:

Patients with CAH exhibit deficits in executive functions. More specifically, CAH patients have a reduced verbal working memory as well as visual spatial working memory and processing speed. These deficits may affect learning and school outcomes. The functional effects may have arisen due to prenatal GC deficit, postnatal GC excess or neonatal salt wasting crisis. It is important to detect cognitive impairment at an early stage to be able to give individual support.

	HC [mean (SD)]	CAH [mean (SD)]	Cohen's <i>d</i>	<i>p</i>
WAIS-IV				
Matrices	11.68 (3.2)	10.70 (3.8)	0.28	.180
Vocabulary	10.08 (2.4)	9.81 (2.5)	0.11	.442
Digit Span	10.48 (2.3)	9.28 (2.5)	0.50	.026
Coding	10.59 (2.5)	10.09 (2.8)	0.19	.333
WMS-III				
Word list (immediate recall)	10.58 (2.3)	10.66 (3.4)	0.03	.949
Span board forward	10.87 (2.8)	9.33 (2.3)	0.61	.006
Span board backwards	12.21 (1.7)	10.70 (2.7)	0.67	.001
Word list (delayed recall)	12.35 (2.1)	12.61 (3.2)	0.01	.768
Stroop task				
Word reading	48.67 (6.6)	45.64 (8.0)	0.41	.079
Colour naming	43.54 (6.1)	40.95 (7.5)	0.38	.062
Interference for rawscores	53.90 (9.8)	46.33 (9.8)	0.77	.000
Interference	56.79 (7.0)	52.19 (8.0)	0.61	.001

Table 1. Mean test scores +/- 1 SD across study groups. Effect sizes (Cohen's *d*) as well as *p*-values for main effects of CAH from a general 2-way MANOVA with dependent factors CAH (CAH, healthy) and GENDER (female, male).

Results

In general, CAH patients scored worse compared to population controls. Significant effects, with moderate to large effect sizes, were observed for verbal and visual spatial working memory as well as for processing speed (Table 1, Figure 1).

Disclosure statement: The authors have nothing to disclose.

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