

# Neuropsychological Sequelae and Brain Function in Adults with Childhood-Onset Growth Hormone Deficiency

The researchers set out to further examine reports of cognitive dysfunction in adults with childhood-onset growth hormone deficiency (GHD) and to investigate potential causes in atypical brain metabolism. Eleven adults (7 male and 4 female) with childhood-onset GHD, who had been treated with GH during childhood for 4 to 16 years (mean duration 8.2 years), were evaluated by neuropsychological testing and magnetic resonance spectroscopy (MRS) at least 3 months after discontinuation of GH replacement. The GHD participants were compared to a health- and demographically-matched control group (n=9). MRS was used to assess brain *N*-acetylaspartate (NAA) and NAA/choline ratios, indices of hormonal density and integrity. The GHD group exhibited significantly lower performance on a delayed memory recall task (15-word delayed recall score), a measure of planning behavior, cognitive processing speed, and attention (Trail-making test, Part A). The GHD group also showed significantly lower NAA and NAA/choline levels, and increased choline levels compared to controls. Finally, IGF-I was significantly correlated with NAA levels, but not with choline levels or NAA/choline ratios. The investigators interpret their findings as corroboration of other reports indicating subtle neurocognitive deficits in adults with childhood-onset GHD. Moreover, these effects (in combination with evidence of reduced NAA level in the brain) resemble those observed in normal aging.

van Dam PS, de Winter CF, de Vries R, et al. *Psychoneuroendocrinology*. 2005;30:357–363.

**Editor's Comment:** *Cognitive function in children and adults with childhood-onset GHD has been the topic of multiple studies. Neuropsychological testing corroborates clinical impressions that associations between GHD and deficits in cognitive performance are subtle; the report by van Dam et al demonstrates an altered brain metabolism while they were off GH treatment. Nevertheless, there is evidence that GHD, which can be a consequence of perinatal insult, cancer (and its treatment), and other pathologic states, may be associated with substantially increased rates of learning disabilities.<sup>1</sup>*

*Future studies of this topic will benefit from larger sample sizes and statistical analyses that adjust for gender, participant's global intelligence, and adequacy of hormone replacement in adulthood for those with multiple pituitary hormone deficits. Presently, the benefits of GH replacement in adulthood on cognitive performance remain unclear. Whereas, physiologic doses of GH in individuals with adult-onset GHD appear to be ineffective,<sup>2</sup> more promising findings derive from a study in childhood-onset GHD.<sup>3</sup>*

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## References

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