



YOUNG PHYSICIANS

Effect of Restricted Diet on ADHD Symptoms

Source: Pelsser L, Frankena K, Toorman J, et al. Effects of a restricted elimination diet on the behaviour of children with attention-deficit hyperactivity disorder (INCA study): a randomised controlled trial. *Lancet*. 2011;377(9765):494-503; doi:10.1016/S0140-6736(10)62227-1

Researchers at multiple medical centers in the Netherlands recruited 100 children aged 4 to 8 years with attention deficit hyperactivity disorder (ADHD), primarily to evaluate the effect of diet restriction on ADHD behaviors. Secondary aims were to delineate nonallergic and allergic mechanisms in food-induced ADHD.

After an initial structured psychiatric interview (SPI) by a physician, children were randomized to control or restricted diet groups for phase one of the trial. The control group was advised about a healthy diet. The restricted diet group was placed on an elimination food plan consisting of rice, meat, vegetables, pears, and water complemented with specific foods: potatoes, fruits, and wheat. After two weeks, children who did not show behavior improvement were restricted to fewer foods. Patients were assessed by parents, teachers, and blinded physicians using four tools: the 18-item ADHD rating scale (ARS), 10-item abbreviated Conner's scale (ACS), strengths and difficulties questionnaire (SDQ), and SPI. At the end of phase one, assessments by a blinded pediatrician using ARS and SPI, and by unblinded parents and teachers using ARS, SPI, and ACS, were completed on all participants. Blood samples for IgE and IgG ELISA testing were taken at the beginning and end of phase one.

Thirty children in the diet group who had significant improvement of ARS and ACS scores ("responders") were reevaluated and randomized into phase two: a double-blind crossover. Based on high or low IgG classification from blood tests drawn in week one, either three high IgG or three low IgG foods were added to their diet. After two weeks, the groups crossed over. Symptoms of ADHD were significantly improved in 64% of children in the diet group. Although the percentage of children in the control group with symptom improvement is not reported, at the

end of the first phase the diet and control groups had significant differences in ARS scores ($P < .0001$) and in ACS scores ($P < .0001$). In the control group, the ARS and ACS scores did not differ significantly between baseline and the end of phase one. During the crossover phase, 19 of the 30 children (63%) had a significant relapse of ADHD symptoms. IgG levels to foods did not predict which foods led to worsening ADHD symptoms. IgE levels rose in only a few children and were not associated with clinical responses on the behavior parameters.

The authors conclude that a strict elimination diet may be valuable to determine if ADHD is induced by food, but the use of IgG blood tests to prescribe diets for these children is not of value.

Commentary by

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Dr Webber has disclosed no financial relationship relevant to this commentary. This commentary does not contain a discussion of an unapproved/investigative use of a commercial product/device.

This is a complex study with compelling results. The researchers have experience in applying the restricted elimination diet to specific ADHD populations.¹ They attempted to apply the same principles to a more general, nonselected group of patients. The researchers suggest that a restricted elimination diet for a five-week period should be tried before drugs or behavior therapy — a major departure from current practice for ADHD. Stimulant medications have been prescribed for ADHD for over 70 years² and are considered a safe, effective standard of care.^{3,4}

The authors acknowledge that parental expectations may have affected behavioral improvements in this partially blinded study, but assessing physicians were blinded to the subjects' group. These researchers also acknowledge a possible positive effect of the increased attention that a restrictive diet demands.

This study supports consideration of dietary changes as treatment for ADHD. A restricted diet may have a lower side effect profile than drugs and require less monitoring on the physician's part; however, the demands on the family are substantial. Especially in the clinical scenario of worsening behavior problems common at the time of ADHD diagnosis, the challenge of implementing a restricted diet prevents it from being used as a first-line treatment. The long-term implications of a restricted diet on nutrition, however, require delineation.

References

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Key words: ADHD, allergy, nutrition

PICO

Question: In children diagnosed with ADHD, does a restrictive diet improve symptoms?

Question type: Intervention

Study design: Randomized controlled

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