Critically Appraised Topic

The use of nutritional supplements for the treatment of Attention Deficit Hyperactivity Disorder

Date: March 19, 2010

Appraised by Emily Andersen, RN, FNP-s

Clinical Scenario: James is a 10 year old male that presents with Attention Deficit Hyperactivity Disorder (ADHD). He has tried stimulants for control of his symptoms but he and his parents have been unhappy with the outcome and side effects that he is suffering. They are interested in treating his ADHD with a focus on complementary and alternative medicine.

Clinical Question: Would the use of complementary and alternative medicine, such as nutritional supplements, be as effective as the use of stimulants in the treatment of ADHD in children and adolescents?

Articles:


Summary and Appraisal of Key Evidence:

The Konafal et.al (2007) studied the effect of iron supplementation on the behavior of children with ADHD. The study included 23 participants (18 boys and 5 girls) between the ages of five and eight, with a diagnosis of ADHD according to the DSM-IV criteria. Participants had an IQ greater than 80, were nonanemic, and had a serum ferritin level less than 30 ng/ml. This study was a double-blind, placebo-controlled, randomized trial that gave one set of participants 80 mg of ferrous sulfate, and the rest of the participants a placebo. The participants were assessed at 4 weeks, 8 weeks, and 12 weeks of treatment. The participants were measured using the Conners’ Parent Rating Scale (CPRS), Attention Deficit Hyperactivity Disorder Rating Scale
(ADHD RS), Conners’ Teacher Rating Scale, Clinical Global Impression-Severity (CGI-S), and iron levels. The changes from baseline at weeks 4, 8, and 12 were analyzed using either the paired Student’s test or the paired Wilcoxon test. Two of the patients dropped out during the study, one due to constipation and the other was lost in follow up. The results showed a non-significant increase in the CPRS scores with the iron group compared to the placebo group. However, the ADHD RS scores significantly decreased in the iron supplement group as compared to the placebo group (p = 0.008) after 12 weeks of treatment. The greatest improvement in the ADHD RS scores was seen in the inattention subscore.

The level of evidence of this article is 2a with a grade of B since the study was a double-blind, placebo-controlled, randomized trial with less than 30 participants (Levels, 2002). The strengths of this study included randomization, greater than 80% of its participants completed the study, and patients, parents, teachers, and administrators were completely blind to which treatment was being given, reducing bias. A major weakness to this study is the small number of participants, especially girls. However, this study is only a pilot study and larger studies will need to be performed to validate these findings.

The Sorgi et al. (2007) examined the effect of high-dose eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) supplements on the behavior of children diagnosed with ADHD. This study included 9 participants (6 boys and 3 girls) between the ages of 8 and 16 that were currently undergoing treatment of their ADHD. Three of the participants volunteered to discontinue their stimulant medication; the remainder of the participants stayed on the same medication at the same dose for the duration of the 8 week study. The participants and at least one parent or guardian met with the psychiatrist at baseline, 4 weeks, and 8 weeks. At the beginning of the study, all participants were given two tablespoons of a liquid EPA/DHA concentrate. The dosage was changed for each participant at week four depending on their AA:EPA ratio of phospholipids in order to maintain a healthy level and ensure compliance. The behavioral assessment used the ADHD Symptom Checklist – 4 (ADHD SC-4), the Clinical Global Impression Scale (CGIS), and the Conners’ Parent Rating Scale (CPRS) to measure their improvement at baseline, week 4, and week 8. The non-paired Friedman test was used to assess statistical significance at the 0.05 level. If the results were statistically significant, the Wilcoxon signed rank test was used as a post-hoc test to compare changes at baseline, week 4, and week 8. The study found that a statistically significant change was noted in the EPA and DHA levels in the patients’ phospholipids with the supplementation (p=0.07). The study also showed that the patients’ scores on the ADHD SC-4 and CPRS showed significant improvement as did the severity of illness score assessed by the psychiatrist (p=0.08).

The level of evidence of this article is 4 with a grade of C due to the fact that this study did not use a placebo to test their results and due to the low number of participants (Levels, 2002). One strength of this study was that the psychiatrists that assessed the participants were completely blind to supplement compliance and dosages which would make them unbiased. Some weaknesses in this study are the low number of participants, the underrepresented female population, and that this study did not compare the use of supplements with a placebo. Therefore their results are not well-validated because they may have gotten the same improvement with a placebo group. A number of larger studies need to be performed to validate the findings of this pilot study. Opportunities for this study would include performing the study with a larger number of participants, with the female population better represented, and using a placebo controlled group to compare results. Threats to this study include not using a placebo group, thereby decreasing the quality of the study.
Clinical Bottom Line:

1. The group members of each of the studies were homogenous in age and all met the diagnostic criteria for ADHD set forth by the DSM-IV. However, the female population was underrepresented in both of these studies. This may be due to the fact that ADHD is much more common in males than in females. Follow up was greater than 80% in both studies but the number of participants was extremely small. Both of these studies were pilot studies so it was not possible to compare these results with results of larger and more valid studies. This leads me to conclude that these studies are of poor quality and that their results need to be questioned.

2. Adverse effects of supplementation were minimal with only one participant dropping out of the study due to these effects.

3. Both studies used widely accepted scales and questionnaires to analyze the behavior of the participants. This increases the validity of each of the studies.

More and more parents are looking for alternatives to medication to treat their children. As practitioners we need to be aware of possible therapies and their efficacy in the treatment of a particular ailment. It is necessary to discern poor quality studies from validated studies in order to find the best treatment for the patient. I will use this information in my clinical practice when assisting parents who wish to pursue complementary and alternative medications, such as supplements, to help treat a disorder such as ADHD.
Resources

