Omega-3 Fatty Acids as an Alternative Treatment for Children with Attention Deficit Hyperactivity Disorder

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Abstract: Attention deficit hyperactivity disorder (ADHD) is the most common disease occurring in child psychiatric practice, which is characterized by motor hyperactivity, attention disorders, impulsivity, and can lead to severe impairments in all major areas of the child’s functioning. In case of an absence of an adequate treatment, children with this disorder can collide with a large number of serious problems, including psychological development and social functioning. In adulthood, the consequences of late diagnosis and lack of ADHD treatment are leading to problems of social relationships, low level of education, poverty, unemployment and related mental disorders. Several pharmacological groups are widely used for ADHD treatment, including stimulants (methylphenidate and amphetamine), selective serotonin reuptake inhibitors (fluoxetine, citalopram and paroxetine) and non-stimulants (atomoxetine). All of these drugs are reported with side-effects and majority of the families with ADHD child are reluctant to start psychopharmacotherapy. Several clinical trials of ADHD treatment with omega-3 fatty acids have been shown positive effects on dynamic and symptom improvement of the disorder. Application of omega-3 fatty acids may be an alternative treatment for ADHD and should be considered as a combination therapy or monotherapy especially for children whose parents have a negative attitude towards traditional therapy.

Keywords – ADHD, Omega-3 fatty acids, EPA, DHA

Introduction

Attention deficit hyperactivity disorder (ADHD) prevalence among preschool children is 1.5-5% ¹-². Despite the fact that in developed countries ADHD is the most frequent reason for seeking help from child psychiatrists, a disorder is often diagnosed late or incorrectly, and the children and their families are not provided with specialist interventions and rehabilitative care ³. Since 2000, the world has witnessed the growth of an ADHD incidence and prevalence and use of drugs for treatment of the disease. Most likely, this is due to the improvement of ADHD diagnosis process and a better understanding of the importance of the problem for public health and society as a whole. Accurate data on the ADHD prevalence in the population of Zambian children is unknown. According to statistics of medical care-seeking behaviour, incidence and prevalence of ADHD are increased in the recent years.

Conventional Approaches To The Treatment Of ADHD

ADHD can be called one of the best studied mental disorder, for which has been developing many effective strategies and aid modalities. The most common treatment used for ADHD are medications and behavioral interventions, although the last seems to be ineffective without pharmacotherapy ³.

For the treatment of ADHD most commonly used stimulants, such as methylphenidate and amphetamine ⁴. There is a strong evidence that these drugs are effective for improving inattention and behavioral symptoms, but their effect on improving cognitive functions and performance is moderate. It should be noted that the positive effect of stimulants continues as long as the child takes them, but the therapeutic response cannot be achieved in at least 30% of cases ⁵. It is important to bear in mind that taking stimulants is associated with side effects such as loss of appetite, weight loss, abdominal pain, headache, and irritability, while most of them are transient in nature. There is also a concern about the adverse action of psychostimulants with prolonged use, including a delay of growth and worsening of comorbid symptoms, such as ticks ⁶.

Antidepressants, such as tricyclics (TCAs) and selective serotonin reuptake inhibitors (SSRIs), anxiolytics (for example, Clonidine and Guanfacine) and Atomoxetine are referred to non-stimulants,
which are taken for the treatment of ADHD. Some of these drugs are also associated with adverse reactions. For example, tricyclic antidepressants associated with a risk of sudden death, and the use of SSRIs, according to some data, can lead to occurrence or strengthening of suicidal ideation in children and adolescents.

Due to concerns about the side effects of pharmacotherapy, approximately 60% of parents of children with ADHD turn to alternative approaches of management of this disorder.

**Omega-3 Fatty Acids and Its Role In ADHD**

According to clinical and biochemical data, ADHD patients show marked functional deficits of certain polyunsaturated fatty acids (PUFAs). Their use is considered to be a possible alternative treatment for such cases.

Role of omega-3 PUFAs deficiency during ADHD and their value in the treatment of this disorder has recently been analyzed in details. A meta-analysis of two separate studies of the profile of blood lipids of children with ADHD and therapeutic interference with ADHD with the application of omega-3 PUFAs was conducted. The results of the first study indicated that compared with the blood lipid profile of healthy children, ADHD children have indicated minimal level of omega-3 PUFAs, wherein the differences are more noticeable of two of them – eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA). The second study has shown a number of important features of these clinical trials of the use of omega-3 PUFAs in ADHD treatment. Firstly, their effect was more pronounced on the manifestations of hyperactivity and impulsivity, and somewhat less by inattentiveness. Secondly, an effect of different omega-3 PUFAs was varied. Significant positive effect on symptomatic improvement was on a high dose of EPA, pointing to favor more of EPA in the composition of omega-3 PUFAs. Importantly, however, that solely by diet greater ratio of EPA than DHA cannot be achieved.

Confirmation of the assumption of a greater role of the EPA in effect on the manifestation of ADHD has been shown in the results of a double-blind, randomized, placebo-controlled clinical trial with a cross-over design in which school-age children with the diagnosis of ADHD (n = 37) took omega-3 PUFAs and placebo. The ratio of EPA:DHA studied composition was 2.5:1. The tendency to improve the behavioral symptoms compared to baseline was detected in the 8th week in a group of children who took omega-3 PUFAs. This was evidenced by the data of the Connor’s’ Parent Rating Scale. After replacing the drug to placebo (after 8 weeks) by the 16th week a statistically significant improvement from baseline values was noted in both groups without significant differences between them. Clinically significant improvement by the end of the test was achieved in approximately 30% of children with ADHD. It should be emphasized that in this test, adverse reactions resulting from the receiving of omega-3 PUFAs were not reported, and the treatment was well tolerated by children.

Moreover, it is reported that using only DHA without EPA did not show any differences between actual DHA therapy and placebo in the treatment of ADHD, behavioral problems, sleep and mood disorders in both children and adults.

**Omega-3 PUFAs For ADHD Treatment**

It is very important in additional or alternative treatment of ADHD to choose those supplementation complexes which represented with omega-3 PUFAs in which the ratio of EPA exceed DHA. Such complexes should comprise EPA (minimum of 40 mg) and DHA (minimum of 15 mg). Application of such complexes are recommended for children and adolescents with ADHD in cases where parents are skeptical of the need for drug therapy, or due to intolerance of stimulants, disruptive behavioral disorders with hyperactivity and impulsivity, as well as for the lability of mood and behavior.

Apart from ADHD, complexes with omega-3 fatty acids complex can be used in other psychiatric disorders of childhood. PUFAs deficiency reported in autism, behavioural, speech, reading, writing, and sleep disorders. Increasing their concentration in the blood as a result of receiving as a dietary supplement of omega-3 PUFAs may improve sleep in children aged 7-9 years, which indicates the role of these acids in the regulation of sleep.

In modern clinical practice, it should be remembered that PUFAs have an impact on the good functioning of the brain. Child age is a critical and vulnerable period for brain development, and PUFAs deficiency at this time can irreversibly affect future memory, learning, and sensory spheres.

**Conclusions**

Currently, the general population has considerably increased interest in possible alternative approaches to treatment, especially if it requires a long-term use of drugs. PUFAs have demonstrated its effectiveness in a number of mental illnesses, such as ADHD,
behavioral disorders, including autism, and depression. Even if the efficacy of the drugs is not sufficient, a significant preponderance of benefit over risk allows you to use them independently or as adjunctive therapy.

References


