

## Attention-Deficit/Hyperactivity Disorder and Herbal Medicine: An Evidenced Based Approach

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### Abstract

Attention-Deficit/Hyperactivity Disorder (ADHD) is one of the most common psychiatric disorders in children and adolescents with a worldwide prevalence of 5%. It is characterized by symptoms of attention deficit and/or hyperactivity/impulsiveness that is maintained for at least six months. ADHD is a neural disorder with structural and functional abnormalities in some areas of the brain. Pharmacotherapy is the most prevalent treatment for all age groups of ADHD patients. ADHD is amenable to drugs that affect the catecholaminergic neurotransmitter pathways among which stimulants stand out. In spite of the fact that stimulants are the most used drugs among current standard treatments and are generally safe and highly effective, they could be associated with unresponsiveness and significant side effects such as sleep disturbances, decreased appetite and mood lability in some children. Sleep problems are suggested to be not only a side effect for current standard treatments but also a common finding in patients with ADHD. Moreover, there is growing interest regarding herbal medicine in the treatment of ADHD. This review focuses on some herbal medicines in ADHD.

**Keywords:** Alternative Medicine, Attention-Deficit/Hyperactivity Disorder, Herbal Medicine

## Introduction

Attention deficit hyperactivity disorder (ADHD) represents a neurodevelopmental condition affecting 3% to 7% of children and is characterized by age-inappropriate inattentiveness, and increased hyperactivity and impulsivity [1-3]. ADHD is closely associated to imbalance of catecholamine metabolism in the cerebral cortex and dysregulation of dopaminergic and noradrenergic neural circuits [3-5]. Treatment of ADHD focuses on administration of stimulants including methylphenidate. These stimulants produce complete remission in about only 30% of cases, and about 10–30% of patients with ADHD may not respond to stimulants or may not be able to endure potential adverse events including reduced appetite, sleep disturbances, mood lability, and exacerbation of comorbid tic disorders [6-8]. Since all cases cannot be attributed to one mechanism, further neurotransmitter systems are becoming of interest for development of effective treatments for refractory ADHD patients. There is growing evidence for use of Complementary or Alternative Medicines (CAMs) in different neuropsychiatric disorders [9, 10]. Evidence indicated that more than half of the children diagnosed with ADHD are treated with one or more CAMs by their parents; Therefore, evidence is required to support claims for efficacy of this treatment in this vulnerable group [11]. For those patients who cannot tolerate or have limited response to stimulants, or families who simply prefer non-stimulant therapy, finding new non-stimulus medicines and supplements that affect the disorder is essential [12-18]. In this

regard herbal medicine is very interesting for evidence based medicine in ADHD.

Caffeine, as found in coffee and other herbal stimulants has been proposed as an alternative to stimulant drugs in the treatment of ADD/ADHD. Although herbal practitioners rarely use caffeine or caffeine-containing herbs alone, many of the most popular formulas do contain stimulating components.

The benefit of caffeine stimulation has been addressed in several studies in this population. In general, these studies have demonstrated significant benefits with the administration of caffeine to children with ADD/ADHD. The benefits however have not been without side effects, and have failed to match or exceed those derived from the conventional stimulant medication regimes.

### *Ginkgo biloba*

*Ginkgo biloba*, one of the more popular herbs used as an ADHD remedy, increases circulation to the brain, according to the American Botanical Council (ABC). Most research on ginkgo has focused on dementia, and on memory and cognitive functions in healthy adults. Herbal remedies for attention deficit hyperactivity disorder sometimes pair ginkgo with ginseng [19, 20].

### *Eleuthero (Eleutherococcus senticosus)*

Eleuthero, also known as Siberian ginseng is one of the more commonly known herbal remedies for ADHD. It works to increase alertness and improve the brain's memory function.

In a recent study, presented at the American Stroke Association, it was found to have

improved the memory of those taking the herb as opposed to a similar group of people who took a placebo.

Eleuthero is also known by herbalists to boost immune systems and interacts with the body to assist in reacting to stress. For these reasons the herb could be helpful in treating ADHD, as it protects and boosts the brain in a variety of ways [19, 20].

• **Brahmi** (*Bacopa monniera*)

This Ayurvedic herb has a long history of use as a cognitive enhancer. Research shows that it protects brain from free radical damage even better than the cognitive-enhancing drug deprenyl (Battacharya), while stimulating improved learning and cognitive function [19, 20].

• **Gotu Kola** (*Centella asiatica*, also *Hydrocotyle asiatica*)

These herbs are not to be confused with the caffeine-containing Kola nut. Their triterpenoid glycosides - asiaticoside, madecassoside, and brahmoside - reduce adrenal corticosterone blood levels during stress. They have also been found to be useful for cognitive and nervous disorders and vascular problems of the brain [19, 20].

• **Green Oats** (*Avena sativa*)

The fresh green seeds have been used as a mild antispasmodic and nourishing nerve tonic. Its tonic effects are not immediately stimulating as with caffeine, but are cumulative and restorative over time with continued use.

**Rhodiola** (*Rhodiola rosea*)

*Rhodiola rosea* is an adaptogen herb that has been shown to be helpful in improving focus in both adults and children. It has also been used to combat fatigue and improve memory.

The herb increases the sensitivity in the neurological and nervous system that produce serotonin and dopamine, which might make it useful in treating some of the ADHD symptoms [19, 20].

**Passion Flower** (*Passiflora incarnata*)

This herb is recommended by herbalists as an herbal treatment for ADHD. It helps to even out mood swings and increases concentration.

According to a study published in the Journal of Clinical Pharmacy and Therapeutics, it was found to have positive benefits in treating generalized anxiety disorder [19, 21].

**Maritime Pine Bark** (*Pinus pinaster*)

This herb is used mainly in extract form for its antioxidant properties, although its needles are recognized for their vitamin C.

Antioxidants have been determined by many researchers to play a significant role in the repairing and protecting the body's cells.

They help to protect against free radicals, which researchers have discovered are damaging byproducts of metabolism and exposure to environmental pollutants. Some areas that have been linked to the damage of free radicals are aging, heart disease and cancer.

It has only been in recent years that free radicals have also been considered as a possible contributing factor in ADD/ADHD.

Maritime pine bark is only one of the anti-oxidant herbs currently recommended. Some herbalists have also reported successes with grape-seed extract – a better known anti-oxidant.

Various combinations of sedative and stimulating herbs have been widely used in naturopathic and herbal practice as one aspect

of treatment for ADHD. The following herbal formula is similar to many of those being recommended for the treatment of ADHD. It includes both stimulant and sedative herbs. In this study it was used to test effectiveness in the treatment of adult adjustment disorder with anxiety. The formula demonstrated significant benefits in the treatment of anxiety, an interesting finding in that it made use of stimulant herbs [19, 20].

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