Dynamic Chiropractic

HERBS/ TEAS & HOMEOPATHY

Boosting Memory With Huperzine A Supplementation

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Huperzine A is an extract from a club moss (from the *Lycopodiaceae* family) that has been used for centuries in Chinese folk medicine for a variety of conditions. In modern times, Huperzine A research has focused on its ability to raise brain levels of the memory chemical acetylcholine; hence its potential role in the treatment and prevention of Alzheimer 's disease, dementia and other cases of memory and learning impairment.[1,2]

Principal Active Constituents

Huperzine A (or HupA) is a specific alkaloid compound that is found in very low concentrations in the moss where it occurs naturally at only a 1 percent concentration. Thus, when used therapeutically, HupA is given as a concentrated extract. Commercially available extracts contain up to 95 percent HupA concentration.[1,2,3] HupA was first synthesized in 1990, which has helped to increase its availability in the marketplace.[3]

Biological Action in Memory Support

HupA is rapidly absorbed by the brain, where it acts as a potent, reversible and selective inhibitor of the enzyme acetylcholinesterase, which breaks down the memory chemical acetylcholine. By inhibiting this enzyme, brain concentrations of acetylcholine are increased, thereby facilitating improvements in memory and learning capacity. A hallmark feature of Alzheimer's disease is reduced concentrations of acetylcholine in specific areas of the brain involved with memory and other cognitive functions. HupA supplementation appears to help increase acetylcholine levels in Alzheimer's patients in cases in which the condition has not yet advanced to the point that brain cells are permanently damaged.

Studies show that HupA provides a longer-acting effect than the drugs tacrine and doneprizil, which are used in Alzheimer's disease, and it also appears to produce fewer side effects. This is due to the fact that only very small doses of HupA are required due to its high specificity for the acetylcholinesterase enzyme. As such, HupA is under intensive investigation as a viable intervention in the prevention and treatment of Alzheimer's disease, dementia and other conditions involving learning and memory impairment.[1,4,5,6] Further, it has recently been reported that HupA also reduces neuronal death (death of nerve cells) caused by glutamate (glutamate toxicity results in seizures associated with exposure to nerve gas), suggesting HupA may act to protect brain cells from various types of degenerative damage and chemical insults. The dual bioactivities (preserving acetylcholine and protecting nerve cells) make HupA an attractive agent to study as a potentially important therapeutic agent for Alzheimer's disease.[1]

Clinical Applications

Alzheimer's and Dementia. In a double-blind trial involving Alzheimer's disease patients, the group

given 200 mcg of HupA, twice per day for eight weeks, demonstrated significant improvement in memory, cognitive and behavioral functions.7 HupA has been used successfully in a clinical setting with approximately 100,000 Alzheimer's and dementia patients in China.[3] At Beijing's Institute of Mental Health, HupA was tested against fodine in 101 patients with benign senescent forgetfulness (age-related memory impairment). After four weeks of supplementation, 70 percent of the group receiving HupA showed significant improvement in their memory as measured by memory quotient (MQ). An additional 111 Alzheimer's patients were also included in the study. Overall, the group receiving HupA demonstrated a 10 percent improvement in the memory quotient over the four-week test period, and significant improvement in other measures of cognitive function. Side effects occurred in only 3 percent of these patients, with the most frequent side effects involving dizziness and gastrointestinal symptoms.[4]

In a study done at Zhejiang Medical University in Shanghai, 103 patients with Alzheimer's disease were given 200 mcg of HupA per day or a placebo. After eight weeks, 58 percent of those receiving HupA showed marked improvement in mental function, compared to 36 percent in the placebo group.[2] In another double-blind study, the administration of HupA at 100-150 mcg, two to three times per day, was shown to be more effective than the drug piracetam in a trial involving patients with age-related cognitive decline.[8] Animal research shows that HupA has a greater ability to preserve acetylcholine levels than some prescription drugs that act as acetylcholinesterase inhibitors.[9,10]

Learning Enhancement. Animal studies show that HupA supplementation provides animals with memory-enhancement and a broad range of improved cognitive behaviors.[5] There is some suggestion that HupA supplementation in otherwise normal individuals can enhance memory and recall ability as well as learning capacity. In a small controlled trial of adolescent middle-school students, the administration of 100 mcg of HupA two times per day was shown to be effective in improving memory and learning performance over a four-week period. Although no side effects were reported, the researchers caution that this was a high dose of HupA for subjects with no apparent signs of acetylcholine deficiency and that the long-term safety of such a practice needs to be established before young, healthy individuals should ingest doses in this range in an attempt to boost their learning capacity.[11]

Dosage and Standardized Grade

For Alzheimer's disease: 150 to 200 mcg, one to two times per day in divided doses.[2,12] For early memory loss: 50 to 150 mcg, one to two times per day in divided doses.[3,12] For general brain support (by age 50-55): consider 25 to 50 mcg per day.

With age, the brain tends to make less acetylcholine, which largely accounts for age-related memory loss that patients often complain about. At age 54, I personally take one capsule per day of a memory support supplement that contains four proven memory-boosting natural agents. Each capsule contains CDP choline - 50 mg; phosphatidylserine - 100 mg (50 percent std grade); *Bacopa monnieri* - 50 mg (std to 20 percent bacosides) and Huperzine A - 25 mcg.

Adverse Side Effects, Toxicity and Contraindications

HupA inhibits the breakdown of acetylcholine by reversibly inhibiting the enzyme acetylcholinesterase. This gives rise to the potential increase in acetylcholine to toxic levels if the

dosage is too high.[1,13] Excessive levels of acetylcholine in the brain can result in cholinergic syndrome, which manifests as a slowing of the heart rate (bradycardia), contraction of the pupil of the eye (miosis), sweating, increased movement of intestinal tract contents (hyperperistalsis), as well as wheezing, excessive salivation, urinary incontinence and excessive discharge of mucus from the air passages of the lungs (bronchorrhea).[14]

To date, none of the human trials using HupA has produced cholinergic syndrome in any subject. However, the potential for this to occur remains plausible and thus, dosage recommendations should be strictly adhered to, and patients and practitioners should closely monitor response to the use of this bioactive agent.[15] Side effects are rare at recommended doses, but may include dizziness and gastrointestinal symptoms.[4,8,10]

Drug-Nutrient Interactions

Acetylcholinesterase Inhibitors (e.g., Donepezil and Tacrine). These drugs also inhibit the breakdown of acetylcholine; therefore, the addition of HupA may potentiate their effects, increasing the likelihood of developing cholinergic syndrome as a serious side effect.[17,18] These drugs on their own are noted for the side effects of vomiting, excess saliva and tear production, and increased sweating, which indicate their tendency to overstimulate the cholinergic system.[15]

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