Phosphatidylserine

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General Features

Phosphatidylserine is the major phospholipid in the brain and plays a role in determining the integrity and fluidity of nerve cell membranes (the outer skin of brain cells). The brain can manufacture Phosphatidylserine, but requires folic acid, vitamin B_{12} and S-adenosylmethionine as cofactors (methyl donors) for its synthesis. Low levels of Phosphatidylserine in the brain are associated with impaired cognitive function and depression in the elderly.[1,11,12] In Italy, Scandinavia and other parts of Europe Phosphatidylserine is widely used to help restore declining mental function and depression in the elderly. As noted, the body makes its own Phosphatidylserine, but when required to treat mental decline and memory loss, a therapeutic dosage is required from external sources.[11,12]

The serine portion of Phosphatidylserine can also be converted into choline and significantly improve acetylcholine synthesis in the brain, aiding memory and reversing some age-related brain changes. Acetylcholine is the neurotransmitter (brain chemical) required for memory.[2,3,4] Thus, Phosphatidylserine may aid memory and cognitive function via its participation as a vital phospholipid component of the nerve cell membrane and as a bioactive agent that can increase brain levels of the memory chemical acetylcholine.[1-4]

Clinical Application and Mechanism of Action

Treatment of Depression and/or Impaired Mental Function in the Elderly

Numerous studies in elderly patients (65-93 yrs) with moderate to severe senility and depressed elderly patients have demonstrated significant improvement in memory, behaviour, mood states and cognitive function with Phosphatidylserine supplementation of 100 mg, three times daily.[5-10] A number of double-blind studies, involving more than 1,000 patients suggest that Phosphatidylserine supplementation improves behaviour and mental function in patients with moderate to severe mental decline, including Alzheimer's disease patients.[12] This is largely attributable to the role that Phosphatidylserine plays within the nerve cell membrane, aiding the conduction of nerve impulses and improving the movement of nutrients in and out of nerve cells. The serine fraction of Phosphatidylserine can also be converted into choline within the brain and is used as substrate from which brain cells can synthesize acetylcholine, the neurotransmitter required for memory function.[1-4,11,12]

Dosage Range

Age-Related Cognitive Decline (Age-Associated Memory Impairment), and Depression in the Elderly: 100 mg, three times per day in the treatment of age-related cognitive impairment, senility and depression of the elderly has been used successfully in a number of well designed clinical trials.

Once improvement is noted (usually within 3-6 months), the dosage can be reduced to 100 mg per day as a maintenance regime. Note that the above cited studies used bovine (cow-brain)-derived Phosphatidylserine, a product that is no longer available (due to the possible risk of "mad cow" disease, or more correctly Creutzfeld-Jacob disease). Most of the Phosphatidylserine available in the marketplace today is derived from soy, but there have been only a limited number of studies using this source of Phosphatidylserine in studies evaluating cognitive function. The use of Phosphatidylserine in the treatment of age-related memory loss and depression is primarily based upon the positive results demonstrated by bovine-derived Phosphatidylserine. Soy-derived Phosphatidylserine is a relatively new product by comparison. Soy and bovine-derived Phosphatidylserine are not chemically identical; however, preliminary animal studies show that soy-derived Phosphatidylserine does have effects on brain function similar to that of bovine-derived Phosphatidylserine. Nevertheless, human trials are necessary to confirm the clinical efficacy of soy-derived Phosphatidylserine for the above-cited purposes.[1-4,11,12]

Adverse Side Effects and Toxicity

Phosphatidylserine is generally regarded as safe when used at recommended dosages. No significant side effects or adverse reactions have been noted, other than mild gastrointestinal distress on rare occasions.[1,11,12]

Drug-Nutrient Interactions

There are no well known drug-nutrient interactions for Phosphatidylserine.[11]

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