The effects of phosphatidylserine supplementation on memory function in older people: A review of clinical literature

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Abstract

Phosphatidylserine is a widely-used nootropic supplement today. It is a key ingredient in many of the most popular pre-made nootropic supplement on the market, and many people use phosphatidylserine as a standalone supplement to enhance cognitive performance and brain health. In this paper, we’ll look at a specific claim made by supplement manufacturers regarding phosphatidylserine: its ability to enhance memory function in the elderly and protect against age-related cognitive decline.

Keywords: Phosphatidylserine, phospholipid, nootropic, memory, learning

1. About Phosphatidylserine

Phosphatidylserine is a naturally-occurring phospholipid found in every cell in the human body. It serves a vital function in your cells; it is a primary structural component of cell membranes. Phosphatidylserine is also needed for cell signaling; when a cell reaches the end of its life, phosphatidylserine triggers apoptosis by moving to the outside of the cell membrane and binding to certain proteins. This is a vital mechanism in the body, as apoptosis is a highly conserved mechanism needed for the destruction of dying or damaged cells and the controlling of inflammation.

Since it has such an important role to play in cell generation, maintenance and cycling, it isn’t surprising that phosphatidylserine has become a widely-used nootropic supplement. At the time of writing, phosphatidylserine is used in most of the top nootropic stacks; in many cases, it is a leading, core ingredient.

2. Benefits of Phosphatidylcholine supplementation

There are several benefits ascribed to phosphatidylserine by the various actors in the biohacking and nootropics world. Obviously, these supposed benefits vary greatly in terms of scientific validity and plausibility. Despite the many outlandish claims made by supplement manufacturers regarding the efficacy of phosphatidylserine as everything from a cure for dementia to a life-extending agent, extensive clinical research has determined that the phospholipid has substantial nootropic properties.

Of these, the most interesting is phosphatidylserine’s ability to improve memory function in people with mild, age-related cognitive decline, along with its ability to seemingly preserve cognitive performance as we age. We will now outline these effects in greater detail.

2.1 Phosphatidylserine and memory function

One of the most notable and established benefits of phosphatidylserine is its ability to improve memory function in older people with mild or perceived (but not clinically diagnosed) cognitive impairment. In several robust clinical trials, phosphatidylserine supplementation has been found to significantly improve memory function in older people who demonstrate some age-related memory impairment.
In one 2010 study published in the *Journal of Clinical Biochemistry and Nutrition*, researchers gave older people (aged 50-69 years) with memory complaints either 300mg of soy-derived phosphatidylserine or placebo per day for six months. The findings are worth quoting here in full:

“Neuropsychological test scores were similarly increased in all groups including placebo group. However, in the subjects with relatively low score at baseline, the memory scores in PS treated groups were significantly increased against the baseline, while those of placebo group remained unchanged. And the memory improvements in Soy-PS-treated groups were mostly attributed to the increase in delayed verbal recall, a memory ability attenuated in the earliest stage of dementia. In conclusion, Soy-PS used in this study is considered as safety food ingredient and 6 months of Soy-PS supplementation could improve the memory functions of the elderly with memory complaints.” [1]

The most interesting thing about this study is that the improvements in memory function from phosphatidylserine were greatest in people with the lowest scores when measured at baseline. Perhaps even more interesting is the particular memory attribute found to be enhanced with phosphatidylserine supplementation: delayed verbal recall. This is one of the first signs of early stage dementia. If phosphatidylserine is particularly effective at improving this facet of memory, it may be due to some underlying mechanism which prevents or slows down the progress of dementia. This is certainly hinted at in other studies.

### 2.1 Phosphatidylserine, Alzheimer’s and dementia

One very interesting study published in 1992 in *Psychopharmacology Bulletin* found that phosphatidylserine may have some extraordinary effects on the progress of Alzheimer’s disease. Researchers gave 51 participants who met criteria for probable dementia either bovine-obtained phosphatidylserine or a placebo for 12 weeks. Every subject given the phosphatidylserine returned significantly better scores on several measures of cognitive function relative to those administered the placebo and to baseline [2].

These findings have been repeated in other clinical trials. One such trial postulated that the mechanism of action behind phosphatidylserine’s effect on Alzheimer’s Disease and dementia is its ability to increase cerebral glucose metabolism. Researchers gave 8 patients identified as having metabolic patterns of Alzheimer’s Disease 300mg of phosphatidylserine daily for 3 weeks. The patients displayed markedly increase glucose metabolism in cortical and subcortical structures, ranging up to 20.3% in the basal ganglia/thalamus and 19.3% in visual cortex. Metabolism was most drastically increased in areas most involved in Alzheimer’s Disease (up to 16%) [3].

### 1.3 Conclusion

There is substantial evidence that phosphatidylserine supplementation improves memory function among older adults with mild cognitive impairment. The most interesting clinical trials published to date seem to indicate that phosphatidylserine can ameliorate the symptoms of early stage dementia and Alzheimer’s Disease. More work should be done, including much larger scale trials, to identify how powerful an effect phosphatidylserine can have on the progression of cognitive decline in older people.

### Acknowledgements

None of the work presented here would exist without the tireless work of the nootropics community. Together, bio-hackers are paving the way toward better cognitive function. It is through their research and their experimentation that we yield improvements in focus, memory, and productivity.

### References

