

Memory -- Failing

In truth, there can be many reasons for faulty mental functioning -- most of them serious, but not life-threatening -- and all treatable with stress management techniques and/or nutritional supplementation.

Various studies show that unyielding stress prepares us for the fight-or-flight reaction to danger. However, when there is no specific physical enemy to fight or to flee from, the body's reactive secretions build up.

How does stress affect memory?

What happens is that stress hormones, which would normally feed the brain, divert glucose into the muscles. When the glucose supply to the brain is reduced, some brain cells function at reduced levels or even die. This is especially noticeable in the hippocampus area of the brain, the seat of memory.

Give anti-stress, tension-reduction exercises to follow each workday. A daily B-complex supplement, which included 100 mg of each of the major B vitamins, will reduce anxiety.

In summary, the regimen helps normalize the flow of glucose into the brain, helped to relax, and supercharge the person with energy and creative confidence.

Patients are not the only ones who misinterpret their memory problems. Doctors sometimes misdiagnose them, too, implanting in their patients a feeling of hopelessness.

A man was said to be in the early stages of senile dementia that would progress inexorably until he required custodial care.

A thorough examination of this patient revealed that he was suffering from multiple, chronic, nutritional imbalances; was profoundly hypoglycemic; and had an under active thyroid gland.

His recommended treatment plan included a drastic diet alteration which was high in complex carbohydrates (55 percent), moderate in protein (25 percent), and low in fat (20 percent); a program of nutritional supplements; and a small dose of thyroid medication. Within 45 days, he was functioning at peak mental and physical levels.

Hypothyroidism, autoimmune thyroiditis, and varying degrees of malnutrition are just a few of the treatable medical conditions which can mimic many Alzheimer's disease symptoms. Others include pernicious anemia, drug reactions, environmental toxins, and chronic infective processes, such as candidiasis and parasite infestation.

These medical conditions -- and many others -- should be ruled out in everyone whose mind is, or seems to be, failing. Once these are ruled out, very often, the key to optimal health is super nutrition.

Some facts on Alzheimer's

Statistics for cumulative nutritional deficiencies and incessant stress far outweigh those for Alzheimer's disease. However, an estimated 10 percent of the population over-50 years and older suffers from this devastating ailment.

Alzheimer's symptoms run the gamut from memory loss to lack of concentration, to disorientation, depression, inability to take care of daily personal needs, and psychotic behavior.

Richard Wurtman, M.D., a prominent authority on the brain's biochemistry, found that the amount of the neurotransmitter choline (derived from lecithin) is reduced by as much as 90 percent in those persons with Alzheimer's disease, which eventually contributes to memory loss.

Raymond Levy, M.D., a brain researcher at the University of London, discloses that daily choline therapy caused continued behavioral improvement of eight of 24 Alzheimer's patients.

Patients who improved averaged 79 years of age. Non-improving patients averaged 69 years of age. This finding led the researcher to believe that choline therapy is most effective in individuals who develop Alzheimer's disease late in life and in patients who have a milder form of this ailment.

Brian L.G. Morgan, in his book, *Nutrition Prescription*, lists his protocol for Alzheimer's disease as 1-2 g of choline a day or 30 g of lecithin.

One of the latest brain-promoting supplements receiving attention of late is docosahexaenoic acid (DHA), an omega-3 long-chain fatty acid, which is said to be essential to both brain and eye development, particularly in infants. DHA typically comes from animal sources such as fish, red meats, organ meats, and eggs. Purified DHA extracted from ocean-dwelling microalgae (the fish get DHA from the microalgae they consume) is also available. Since many Americans are making efforts to reduce their intake of such foods, DHA supplementation may be beneficial.

As mentioned earlier, lecithin is also a good source of brain-boosting phospholipids; this includes phosphatidylcholine, which helps to promote healthy brain and liver function, and phosphatidylserine, which has also been shown to aid cognitive abilities, such as memory and concentration, in older adults. In addition to being found in lecithin, these phospholipids are also available as individual supplements.

Other work has focused on choline, a substance in lecithin, which is found, for instance, in egg yolks and soybeans. To the psychopharmacologist, lecithin is a particular set of compounds known as phospholipids, or PC's. But to the health food industry, "lecithin" is

usually a mixture of compounds, only about 20 percent of which are PC's. The psychiatric applications use only the pure form.

In the brain, choline stimulates production of the neurotransmitter acetylcholine. The brain structures rich in acetylcholine tend to be among those that deteriorate most severely in Alzheimer's disease.

Choline supplements, some studies have shown can sometimes reduce or slow certain symptoms of Alzheimer's disease, though the treatment by no means reverses the deterioration.

Dr. Wurtman and his colleague at M.I.T., Dr. Ismail Ulus, reviewed data suggesting that Alzheimer's disease involves a susceptibility to the depletion of acetylcholine neurons, and that choline supplements can increase the effectiveness of other drugs currently being tested in a major nationwide study of the disease.

In research by Bruce Cohen, a psychiatrist at Harvard Medical School, choline was found to render anti-psychotic drugs more potent in shortening the periods of manic excitement in manic-depressives.

Perhaps the most promising psychiatric use of choline is in treating tardive dyskinesia, a serious side-effect of antipsychotic drugs in which the patient develops uncontrollable facial tics and contortions. Tardive dyskinesia occurs in about 15 percent of longtime users of medication for schizophrenia.

"Choline supplements suppress the movements of tardive dyskinesia in about half of patients," according to John Growdon, a professor of neurology at Harvard medical school, who did some of the original research on tardive dyskinesia.

It was only in the early 1970's that researchers began serious study of links between food and the brain, and more recently still that they have sought to find applications in psychiatry. The steady increase in scientific knowledge holds promise, if only limited promise, in the

view of many familiar with the findings. For most psychiatrists, however, the entire approach is too radically new to find widespread acceptance.

"These approaches have met with intense skepticism from the beginning," said Dr. van Praag. "It seemed absurd to psychiatrists that what you eat could directly influence the brain. By now, though, the data from animals and people is hard to deny. The question is how far we can go in finding useful applications in psychiatry."

Nutrients for brain functioning

Every essential nutrient -- that is, each one which must be supplied by the diet -- is, of course, important in brain functioning. Antioxidant nutrients, particularly, beta-carotene and vitamins C and E, prevent the buildup of cell-destroying free radicals.

Glutamine, a derivative of the non-essential amino acid, glutamic acid, has been found to cross the blood-brain barrier easily to supercharge the brain. A known detoxifier, glutamine helps to clear the brain cells of ammonia created by the breakdown of protein, which, if left unchecked, can cause irritability and hallucinations.

Perhaps the premier agent for dissipating mental fogginess and improving failing memory is the wonder herb, ginkgo biloba.

Ginkgo's amazing powers are realized through its mechanisms which have been shown to increase blood-brain circulation and prevent damage caused by free radicals. Ginkgo also enhances the brain's ability to turn glucose into energy and, in this way, increase nerve cell transmission. Ginkgo also increases brain production of the energy molecule ATP, keeps brain blood vessels flexible, and prevents platelet aggregation (clumping), which can reduce vital brain circulation. Ginkgo also appears to increase brain "alpha-wave" activity associated with alertness, while decreasing "theta-wave" activity related to lack of attention.

Many ginkgo users fail to realize the greatest benefits from this botanical because they expect instant results and fail to give it a fair trial. Standardized ginkgo extract works wonders in many people, but its effects seem to build over a period of time.

Serotonin

Serotonin also influences mood and appetite, and some psychiatric uses of tryptophan under study focus on conditions in which the craving for carbohydrates is associated with depression. For instance, this combination is common among those who suffer from seasonal affective disorder, a pattern of depression that comes and goes with winter.

And victims of bulimia go on eating binges, typically of desserts like cake, after which they use purges to keep their weight down. Many bulimics are also depressed. The same combination of depression and carbohydrate craving is also found in premenstrual syndrome.

Dr. Wurtman believes that in each of these disorders the desire for carbohydrates is, as he puts it, "the brain's way of medicating itself," by increasing its levels of serotonin. The carbohydrates often seem to lift feelings of depression, if only for a while.

A treatment for depression has been based on the action of tryptophan. It uses doses of pure 5-HTP, the substance that tryptophan converts to in the brain. In several European countries, 5-HTP is used by psychiatrists as an antidepressant.

Clinical studies have shown that 5-HTP is effective for many depressed patients, especially when given in combination with certain antidepressant drugs, according to Herman van Praag, chairman of the department of psychiatry at Albert Einstein Medical School in New York City, and one of the early researchers on psychiatric applications of nutrients.

Transport of nutrients and hormones through the blood-brain barrier

An understanding of the mechanisms of transport of circulating nutrients and hormones through the brain capillary wall, i. e., the blood-brain barrier, is important because the availability in brain of these substances influences a number of cerebral metabolic pathways. For example, the utilization by brain of glucose, ketone bodies and branched chain amino acids or the production of monoamines, acetylcholine, carnosine, and nucleosides may under certain conditions be influenced by BBB transport of circulating precursor nutrients. Steroid and thyroid hormones readily traverse the BBB via lipid-mediation and carrier-mediation, respectively. Although the steroid and thyroid hormones are tightly bound by plasma proteins, protein-bound hormone, not the free (dialyzable) moiety, is the major plasma fraction transported through the BBB. With regard to circulating peptides, the available evidence indicates peptides rapidly distribute into brain interstitial space of the circumventricular organs of brain, i. e., about six small regions around the ventricles which lack a BBB. Conversely, the absence of peptide carriers in the BBB prevents the rapid distribution of peptides into the vast majority of brain interstitial or synaptic spaces. However, recent studies indicate that some peptides, e. g., insulin, may bind specific receptors on the blood side of the BBB and thereby transmit messages to cells on the brain side of the BBB, without the peptide traversing the capillary wall.

"Brain-specific" nutrients: a memory cure?

We review the experimental evaluations of several widely marketed nonprescription compounds claimed to be memory enhancers and treatments for age-related memory decline. We generally limit our review to double-blind placebo-controlled studies.

The compounds examined are phosphatidylserine (PS), phosphatidylcholine (PC), citicoline, piracetam, vinpocetine,

acetyl-L-carnitine (ALC), and antioxidants (particularly vitamin E).

In animals, PS has been shown to attenuate many neuronal effects of aging, and to restore normal memory on a variety of tasks.

Preliminary findings with humans, though, are limited. For older adults with probable Alzheimer's disease, a single study failed to demonstrate positive effects of PS on memory performance. For older adults with moderate cognitive impairment, PS has produced consistently modest increases in recall of word lists. Positive effects have not been as consistently reported for other memory tests. There is one report of consistent benefits across a number of memory tests for a subset of normal adults who performed more poorly than their peers at baseline.

The choline compounds PC and citicoline are thought to promote synthesis and transmission of neurotransmitters important to memory. PC has not proven effective for improving memory in patients with probable Alzheimer's disease. The issue remains open for older adults without serious degenerative neural disease. Research on citicoline is practically nonexistent, but one study reported a robust improvement in story recall for a small sample of normally aging older adults who scored lower than their peers in baseline testing.

Animal studies suggest that piracetam may improve neuronal efficiency, facilitate activity in neurotransmitter systems, and combat the age-related decrease in receptors on the neuronal membrane. However, for patients with probable Alzheimer's disease, as well as for adults with age-associated memory impairment, there is no clear-cut support for a mnemonic benefit of piracetam.

Vinpocetine increases blood circulation and metabolism in the brain. Animal studies have shown that vinpocetine can reduce the loss of neurons due to decreased blood flow. In three studies of older adults

with memory problems associated with poor brain circulation or dementia-related disease, vinpocetine produced significantly more improvement than a placebo in performance on global cognitive tests reflecting attention, concentration, and memory. Effects on episodic memory per se have been tested minimally, if at all.

ALC participates in cellular energy production, a process especially important in neurons, and in removal of toxic accumulation of fatty acids. Animal studies show that ALC reverses the age-related decline in the number of neuron membrane receptors. Studies of patients with probable Alzheimer's disease have reported nominal advantages over a range of memory tests for ALC-treated patients relative to placebo groups. Significant differences have been reported rarely, however. Whether ALC would have mnemonic benefits for aging adults without brain disease is untested as far as we know.

Antioxidants help neutralize tissue-damaging free radicals, which become more prevalent as organisms age. It is hypothesized that increasing antioxidant levels in the organism might retard or reverse the damaging effects of free radicals on neurons. Thus far, however, studies have found that vitamin E does not significantly slow down memory decline for Alzheimer's patients and does not produce significant memory benefits among early Parkinson's patients. Neither did a combination of vitamins E and C significantly improve college students' performance on several cognitive tasks.

CONCLUSIONS:

In sum, for most of the "brain-specific" nutrients we review, some mildly suggestive effects have been found in preliminary controlled studies using standard psychometric memory assessments or more general tests designed to reveal cognitive impairment. We suggest that future evaluations of the possible memory benefits of these supplements might fruitfully focus on memory processes rather than on memory tests per se.