

EXCITOTOXINS

Death by Profit Margin

by Ronald L. Myers, CNC

If you are not familiar with this term and the class of chemicals it defines, spend the next few minutes reading and begin to learn about the harmful effects excitotoxins can have on you, your family and patients. This brief article is not intended to be a definitive work on this subject, but hopefully will whet your appetite to become more informed regarding this vital health issue. Because we are *all* exposed to these chemicals, our best course of action is defense against their damaging effects.

WHAT ARE EXCITOTOXINS?

Excitotoxins are amino acids that also serve as neurotransmitters in the brain, such as glutamate, aspartate and cysteine. When brain neurons are exposed to these excitatory neurotransmitters in too high a dose, they can become very excited and fire their impulses very rapidly until they reach a state of exhaustion. Sometime later, these neurons suddenly die as if they were "excited" to death. Because of this progression, neuroscientists have named this class of chemicals "excitotoxins".

Please note, the excitotoxins are amino acids that are also *neurotransmitters*! Our brain, nervous system and entire body cannot operate without these chemical messengers. They are not destructive or toxic of themselves; it is an issue of balance. This brings up an important issue regarding nutritional therapy that we must consider. This issue is Amino Acid Therapy as part of a nutritional protocol. As I have said before, the idea that it's "just" a food supplement or a "nutritional therapy" so you can't *hurt* anyone is a myth. Anything that has power, let's say the power to help; also has the power to harm if used incorrectly. Food supplements, nutritional therapies, can do great harm if not used appropriately.

In the area of specific amino acid therapy there is much that is still unknown as far as potentially harmful side effects. Let me encourage you to be careful and proceed with wisdom using these therapies. Here are some good general rules to follow regarding amino acid therapy. 1) If you are considering using a specific amino acid, (such as glutamine, aspartic acid, cysteine, etc), document the need first. 2) *Do not* dose single amino acids on an empty stomach, especially those that are also excitatory neurotransmitters. 3) Consider balancing single amino acid supplements with a broad-spectrum amino acid supplement. When your patients consume foods containing MSG (glutamate) or aspartic acid (NutraSweet, Equal, etc), these amino acids can reach high levels in the blood stream. They have free access across the blood-brain barrier where they function as excitatory neurotransmitters, or in this case, when present in too great a concentration, they can have the morbid function of excitotoxins! Patients may cause possible damage to themselves by unknowingly consuming foods containing these potential excitotoxins. Let's make sure our patients are not harmed by following an ill-advised nutrition program. Our bodies cannot discriminate between potential excitotoxins consumed as part of food or dosed as part of a nutritional protocol.

THE "EXCITOTOXINS"

Now that we know what excitotoxins do, what substances or chemicals are included in this category? So far, over 70 types of excitotoxins have been identified. What follows is a list of the most common ones found in our food supply, as compiled by Russell Blaylock, M.D. in "Excitotoxins-The Taste that Kills": Monosodium Glutamate (MSG), aspartate (NutraSweet), hydrolyzed vegetable protein. The glutamate manufacturers and food processors are always looking for ways to disguise these excitotoxin additives.

Here are some of the code names used for these additives: hydrolyzed protein, hydrolyzed plant protein, plant protein extract, sodium caseinate, calcium caseinate, yeast extract, textured protein, autolyzed yeast, hydrolyzed oat flour. These additives ALWAYS contain MSG. You should be on the lookout for the following additives as well because they may be code names for MSG and/or other excitotoxins: malt extract, malt flavoring, bouillon, broth, stock, flavoring, natural flavoring, natural beef or chicken flavoring, seasoning, spices, carrageenan, enzymes, soy protein concentrate, soy protein isolate, whey protein concentrate.

Keep in mind, the ONLY reason these toxins are added to food is to enhance the *TASTE* of the food. No other reason, this is the only purpose they serve. But to the manufacturers of MSG and Hydrolyzed Vegetable Protein like Ajinomoto, and to food processors like General Foods, Borden's, Oscar Mayer, Libby, Pillsbury, Campbell Soups, etc, it's an important purpose since the addition of these taste enhancers to their food products has meant multiple billions of dollars more in profits. Also consider that the amount of MSG added to foods has doubled every decade since the 1940's. The innocuous sounding "hydrolyzed vegetable protein" is even more dangerous than MSG; it contains three excitotoxins (glutamate, aspartate and cysteic acid) and several known carcinogens. As I said at the beginning of this article, we are all exposed to these neuro toxins. If you eat anything out of a box, bag or can, (or eat in a restaurant) read the label and see for yourself, you have just been exposed to *at least* one excitotoxin.

HOW DO EXCITOTOXINS DO THEIR DAMAGE?

This can be explained with a simplified discussion of neurotransmitters and receptor site activity. Neurotransmitters have been likened to "keys" and receptor sites to "locks". Glutamate and aspartate are both neurotransmitters, but in excess become excitotoxins due to their ability to activate neuron receptor sites opening the flow of calcium into the nerve cell causing it to fire its impulse. In excess, these neurotransmitters cause the calcium channels to remain open allowing calcium to flood the cell. This excess calcium activates enzymes that begin to break down the cell membrane releasing fatty acids. As fatty acids are released, another set of enzymes act on them releasing a free radical cascade that rapidly destroys the nerve cell. There are systems in place to regulate concentrations of neurotransmitters around the nerve cell, and to regulate calcium flow into the cell, but these systems can fail if not enough energy is present to power them. Certain nutritional factors (magnesium and zinc) have been shown to play a major role in calcium channel regulation as well.

There is a mountain of *independent* research detailing the damage that excitotoxins do to the human brain. They are everywhere in our food supply today. Unless you are going to eat only unprocessed, fresh, whole, organic foods, you are going to be exposed to these destructive additives. There are things you can do to protect yourself that can minimize the neurological damage. The best way to minimize damage is to avoid exposure as much as possible. Stop eating foods out of boxes, bags, and cans. Eating in restaurants presents a problem; if your meal has gravy, sauces, dressings, bread, dessert, etc, you have been exposed to at least one excitotoxin. Some of your family members or patients may be in an occupation where they eat at least one meal a day in a restaurant. There are ways you can help them neutralize some of the harmful effects of excitotoxins.

Do not assume that health food stores are beyond the reach of excitotoxic food additives. Read a few labels and you can find foods and food supplements that contain one or more of the excitotoxins. Everything from MSG to hydrolyzed vegetable protein to aspartame. Sports supplements and weight loss products usually contain NutraSweet or one or more of the other excitotoxins. So, caveat emptor!

NATURAL DEFENSES TO EXCITOTOXIN EXPOSURE

A consistent supply of energy to the brain is required if neurons are to be protected against the damaging effects of excitotoxins in all forms. The brain uses 20% of the body's oxygen and 25% of its glucose while making up only 2% of its weight. Conditions like hypoglycemia can cause an energy shortage in the brain leading to failure of the main systems in place to regulate neurotransmitter concentration around neurons and calcium accumulation inside neurons. As mentioned above, zinc and magnesium play important roles in calcium channel regulation. Zinc causes the channel to remain closed, allowing no calcium into the cell. We can see how zinc in excess could present a problem. Magnesium also causes the calcium channel to remain closed, but if the nerve fires, the MG lock is blown and calcium allowed to enter the cell.

Neuroscientific research by Russell Blaylock, John Olney, George Schwartz and others has shown that factors provided by nature are the best defense against the technological "advancements" making excitotoxin food additives possible. Magnesium, as we have seen, plays a key role. There is no doubt that the average American's diet is deficient in magnesium. Those deficient in magnesium have an increased risk of neural damage from exposure to excitotoxins. This is too important to guess about. Serum magnesium that is below reference range on blood chemistry indicates a need for magnesium. The problem with serum mg blood studies is that mg is not a serum mineral but a cellular mineral. I know of several cases where the patients serum mg was within range but their red cell mg was decreased, indicating a need for magnesium. To be sure, it is worth the extra expense to order a red cell magnesium for your patients to rule out or establish magnesium need for each individual. Adequate magnesium equals increased protection from the damaging effects of excitotoxin food additives, inadequate magnesium equals increased risk of neural damage from excitotoxin exposure. With repeated exposure and accumulating neural damage the patient will begin to present symptoms of Alzheimer's disease, Parkinson's disease, Amyotrophic Lateral Sclerosis (ALS), or Huntington's disease, depending on which area of the brain was damaged in their case. Neurologists have found that the symptoms of these diseases do not begin to appear until 80 to 90% of the neurons in the involved nuclei have died. Prevention is of utmost importance!

Hypoglycemia and other sugar-handling problems are on the increase. Obesity is epidemic. Hypoglycemia and obesity (if the person is following a low calorie weight loss diet) can both contribute to critically low energy in the brain and failure of the neuro-protective systems. These are highly efficient pumping systems that remove excess glutamate, etc from the extracellular space and excess calcium from the inside of the neuron. This pumping system has been likened to a bucket brigade used in putting out a fire or to bail out a sinking boat. Enormous amounts of energy are needed to power this system. If not enough energy is available; the system fails, leaving the brain cells exposed to the effects of excitotoxins.

THE CONCLUSION OF THE MATTER IS THIS: as stated above, the ONLY reason for the addition of MSG, hydrolyzed vegetable protein, aspartame, etc to foods is to enhance the *TASTE* of the food thereby greatly increasing sales. This is death by profit margin, because the research is clear regarding the damaging effects of these additives. Profits are more important than people to the food processors!

NUTRITIONAL DEFENSES AGAINST EXCITOTOXINS

Biotics Research Corporation provides a number of superior products that you can use to provide a designed nutritional strategy to your patients. .

MG-ZYME each tablet provides 100 mg of organically combined magnesium.

E-MULSION 200 each capsule provides 200 IU of emulsified vitamin E, 20 mcg of SOD and 20 mcg Catalase.

BIO-C-PLUS 1000 each tablet contains 1000mg of mixed ascorbates as vitamin C. Much of the vitamin C available in the market place today is oxidized. Biotics provides only the reduced forms of vitamin C. Vitamins C and E are important because they are the main antioxidants the brain uses for protection from free radicals. Also used extensively for this purpose are SOD, Catalase and Glutathione. These can easily access the blood brain barrier to reach the brain cells where they are needed most. Most BRC products contain SOD and Catalase. (The Lingual Ascorbic Acid test will identify patients needing vitamin C).

BIOPROTECT is a full spectrum anti-oxidant containing vitamins C and E, as well as several other powerful anti-oxidants including zinc, selenium, co-enzyme Q10, SOD, catalase and glutathione. Neurologists have found that adequate levels of anti-oxidants in the brain protect it from secondary damage caused by free radicals after brain injury. Excitotoxin brain injury also causes damage due to the increased free radical activity they cause. BioProtect taken daily can give your patients increased protection from brain cell damage due to increased free radical activity.

ZN-ZYME (Zinc) is also a factor in protecting neurons from the morbid effects of excitotoxins. In excess, it presents a problem, causing the calcium channel to lock and not allow this mineral into the cell under any circumstances. But it is needed in balance. Many in our society today are zinc deficient. The Zinc Taste test is a valid, non-invasive means of evaluating your patients zinc need. Patients are asked to taste a solution of zinc sulfate. If they experience an immediate bad taste, their zinc stores are adequate. A high percentage of your patients will report no taste, or tastes like water after as much as 30 seconds. These patients have a marked need for zinc. Supplement them with 60 mg of zinc (**ZN-ZYME**) for 30 days and then re-do the taste test. If no change is noted after 30 days, one or more of the zinc synergists may also be needed. These are magnesium and vitamin B6 primarily. A red cell magnesium will confirm mg need. A decreased SGOT on blood chemistry, less than 10, can be extrapolated as a need for B6. If a patient has used birth control pills, this could be considered a second witness of a need for B6.

AMINO ACID QUICK SORB provides glycolytic amino acids for a quick source of energy to the brain. These amino acids are in liquid form for sublingual use insuring rapid absorption.

AMINO SPORT is a full spectrum amino acid supplement providing branched chain amino acids, which are neuro-protective, as well as other essential and conditionally essential amino acids in balance.

You may want to consider testing combination products manufactured by BRC that may contain adequate amounts of nutrients to supply your patients needs, such as: **BIO-CARDIO PAKS**, **BIO-GLYCOZYME FORTE**, **BIO-MUSCULOSKELETAL PAK**, **EQUI-FEM**, **GLUCOBALANCE**, **GSH-PLUS** (glutathione), **MCS**, and **PMT**.

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