

Fight Depression Using Amino Acid Therapy

Major depression is a serious medical illness affecting 9.9 million American adults, or approximately 5 percent of the adult population in a given year. Unlike normal emotional experiences of sadness, loss, or passing mood states, major depression is persistent and can significantly interfere with an individual's thoughts, behavior, mood, activity, and physical health. Depression is typically treated with anti-depressant medications such as Prozac. Amino Acid Therapy can be a well tolerated and effective alternative to prescription antidepressants for many patients.

To be diagnosed with clinical depression, at least five of the nine symptoms below must be present for two weeks or more, most of the time, almost every day.

- Depressed mood
- Reduced level of interest or pleasure in activities
- A considerable loss or gain of weight or appetite
- Insomnia or excessive sleeping Behavior that is agitated or slowed down
- Fatigue or diminished energy
- Thoughts of worthlessness or guilt
- Reduced ability to think or concentrate
- Frequent thoughts of suicide or death, or suicide attempts

Contributing Factors

One of the leading factors associated with depression is reduced levels of the neurotransmitters norepinephrine, serotonin, and dopamine (the amine theory) (Hou C et al 2006; Prange AJ et al 1974). It is likely that several factors, including a genetic predisposition and hormone imbalances, work together in any particular individual to bring on a depressive episode. There is also evidence that the structure of the brain itself may be altered in depression, especially the hippocampus (Campbell S et al 2004), although few studies have been conducted on effective treatment for these changes. Other factors that may contribute to depression include oxidative stress, which can cause cell membrane and DNA destruction in the brain (Khanzode SD et al 2003), inflammation (Elenkov IJ et al 2005), and hyperactivity of the hypothalamic-pituitary-adrenal (HPA) axis (Antonijevic IA 2006).

Mood Regulating Neurotransmitters

For many years, it has been known in medicine that low levels of these neurotransmitters can cause many diseases and illnesses. A neurotransmitter imbalance can cause Depression, anxiety, panic attacks, insomnia, irritable bowel, hormone dysfunction, eating disorders, Fibromyalgia, obsessions, compulsions, adrenal dysfunction, chronic pain, migraine headaches, and even early death. The most common neurotransmitter imbalances targeted by the pharmaceutical industry are Dopamine, GABA, Glutamate, Norepinephrine, and Serotonin.

Amino acid therapy or Neurotransmitter Precursor Therapy

It is well understood that neurotransmitters are synthesized from amino acids obtained from protein in the diet. This starts via the actions of specific chemicals and enzymes, which break proteins into their amino acid constituents. These amino acids are the substrate for enzymes that can change the amino acids into neurotransmitters.

The blood-brain-barrier is a protective barrier that helps to keep out dangerous substances and maintain a steady environment for the brain. It also prevents many neurotransmitters in the body from accessing the brain, therefore using amino acids (neurotransmitter precursors) in certain combinations, and with appropriate administration timing allows us to manufacture more of the specific mood elevating neurotransmitters in the brain. Because amino acids compete with other Large Neutral Amino Acids for access to the brain, it is important to control the timing of protein containing foods when products containing precursors are taken. High protein foods and protein powders increase the levels of all these amino acids and this actually decreases the synthesis of serotonin in the brain. Taking precursor amino acids such as tyrosine and 5 HTP with a carbohydrate and away from a protein meal will ensure increased conversion to the desired mood repairing neurotransmitters.

The Catecholamines

Dopamine, Epinephrine, and Norepinephrine, (catecholamines), are responsible for motivation, energy, interest, sexual functioning, pleasure/reward, drive, attention, and concentration. They are associated with positive stress states such as being in love, exercising, listening to music, and sex. Deficient levels contribute to difficulty initiating or completing tasks, depression, poor concentration, low energy, and lack of motivation. Addictive behaviors such as alcohol, drug use, cigarettes, gambling, and overeating may occur.

L-Tyrosine a Catecholamine Precursor

L-tyrosine is a precursor for the synthesis of the catecholamines epinephrine, norepinephrine and dopamine, the thyroid hormones thyroxine and triiodothyronine, and the pigment melanin. The mechanism of L-tyrosine's putative antidepressant activity may be accounted for by the precursor role of L-tyrosine in the synthesis of the neurotransmitters epinephrine, norepinephrine and dopamine. Elevated brain norepinephrine and dopamine levels are thought to be associated with antidepressant effects.

One study has concluded that tyrosine can protect against some forms of environmental stress. Subjects were given a 100 mg/kg dose of tyrosine and then exposed for 4.5 hours to cold and hypoxia in this double-blind, placebo-controlled crossover study. Tyrosine was reported to significantly decrease adverse symptoms, including mood and performance impairment. Follow-up is needed.

GABA

GABA (Gama amino butyric acid) is the major inhibitory neurotransmitter of the brain, it keeps the excitatory system from becoming overactive, relaxes and calms. Low levels are associated with substance abuse, anxiety, depression, panic attacks, seizures, and mood swings. This neurotransmitter and its receptors is the target of addictive drugs such as Ativan, and Xanax.

Glutamate

Glutamate is the major excitatory neurotransmitter in the brain. It is required for learning and memory. Low levels can lead to tiredness and poor brain activity. Increased levels of glutamate can cause death to the neurons (nerve cells) in the brain, a symptom of this would be memory loss. Dysfunction in glutamate levels are involved in many neurodegenerative diseases such as Alzheimer's disease, Parkinson's, Huntington's, and Tourette's. High levels also contribute to Depression, OCD, and Autism.

L-Theanine a GABA Precursor and Glutamate Modulator

Theanine may have both mood-enhancing and nootropic properties. It helps support GABA and the inhibitory system to calm down over stimulated nerve cells. It works to prevent neurotransmitter over stimulation, keeping the excitatory system in balance. This amino acid has been studied extensively for its ability to reduce the uptake of the excitatory (stimulating) amino acid glutamate and balance out how much Serotonin, dopamine, and norepinephrine is excreted. Theanine has been found to have a protective effect for the brains neurons shielding them from the deadly toxic effects of oxidation and glutamate over stimulation.

The possible benefits of Theanine supplementation include neuroprotection, improved mood and reduced anxiety, improved learning ability, reduced blood pressure and cholesterol levels, antioxidant effects, anticarcinogenic effects (especially in combination with other drugs), improved immunity, weight loss, and treatment of PMS

Serotonin

Serotonin is key to our feelings of happiness and very important for our emotions because it helps defend against both anxiety and depression. Symptoms of depletion include a sad depressed mood, anxiety, panic attacks, low energy, migraines, sleeping problems, obsession or compulsions, feel tense and irritable, crave sweets, and have a reduced interest in sex. Additionally, hormones and Estrogen levels can affect serotonin levels and this may explain why some women have pre-menstrual and menopausal mood problems. Moreover, stress can greatly reduce serotonin supplies.

Serotonin Precursors: 5-Hydroxytryptophan or L-Tryptophan

5 HTP

5-Hydroxytryptophan is the immediate precursor in the biosynthesis of the neurotransmitter 5-hydroxytryptamine (5-HT or serotonin). The mechanism of the possible antidepressant activity of 5-HTP is accounted for by its conversion to the neurotransmitter serotonin which plays a central role in the affective state. While the blood-brain-barrier is very good at excluding molecules that are large and/or charged, small lipophilic molecules like 5-HTP can cross the blood-brain-barrier easily.

Scattered studies have shown that supplemental 5-HTP has significant anti-depressant effects in some. In one double-blind, multicenter study, 5-HTP was said to have antidepressant effects slightly better than the SSRI fluoxetine. Other studies have been more equivocal.

There is some evidence that 5-HTP has some analgesic activity in those with Fibromyalgia, and in one study, 5-HTP was found to have some beneficial effect in those with chronic tension headache. 5-HTP has also been found to increase beta-endorphin and platelet met-enkephalin levels, which may signify a reinforcing effect upon endogenous analgesic effect.

L-Tryptophan

L-Tryptophan is the precursor to Serotonin, a neurotransmitter in the brain, which is deficient in depression. L-Tryptophan is a natural relaxant and helps alleviate insomnia by inducing normal sleep. L-Tryptophan reduces anxiety & depression; helps in the treatment of migraine headaches; helps the immune system; helps reduce the risk of artery & heart spasms.

CoFactor Vitamins help precursor amino acids synthesize into neurotransmitters.

Vitamin C A required co-factor for the conversion of 5-HTP to Serotonin, it also prevents 5-HTP from converting to Serotonin in the GI tract. Vitamin C is also a required nutrient in the conversion of dopamine to norepinephrine.

Folic Acid Vital for a healthy nervous system. Low levels are associated with depression and dementia. Helps prevent and lower toxic Homocysteine which can cause heart attacks and strokes. Folic acid is a required nutrient for the formation of many neurotransmitters.

Vitamin B6 Pyridoxyl 5' Phosphate is the active co enzymatic form of B6. Pyridoxyl-5-Phosphate is required for amino acid and fatty acid metabolism, and in the production of Serotonin and other key neurotransmitters. It is vital to prevent the production of toxic Homocysteine and in the methylation process which converts one neurotransmitter into another.

Vitamin B 12

Required for neurological health and fatty acid metabolism. Deficiency of Vitamin B-12 results in pernicious anemia and fatigue. Vitamin B-12 is stored in the liver and affects the neurological systems. Besides anemia, B-12 deficiency may include dementia, depression, and poor attention span as a result of neurological degeneration.

Amino Acids can be a well tolerated and effective alternative to prescription antidepressants for many patients. They often work within days instead of weeks with little to no side effects.

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