

GABAhhh Soothing Cream for Anxiety: The Science

gamma-Aminobutyric acid, or -aminobutyric acid, or GABA, is the chief inhibitory neurotransmitter in the developmentally mature mammalian central nervous system. Its principal role is reducing neuronal excitability throughout the nervous system. Accordingly, increased levels of GABA in the CNS can result in relaxant and anticonvulsant (antiepileptic) effects as well as alleviating symptoms of anxiety and depression.

GABA is primarily synthesized from glutamate via the enzyme glutamate decarboxylase (GAD) with pyridoxal phosphate (the active form of vitamin B6) as a cofactor.^{1,2} GABA transaminase enzymes catalyze the conversion of GABA and 2-oxoglutarate (-ketoglutarate) into both succinic semialdehyde and also back to glutamate. Succinic semialdehyde is then oxidized into succinic acid by succinic semialdehyde dehydrogenase and as such enters the citric acid cycle as a usable source of energy.³

Two general classes of GABA receptor are known:⁴

- GABA_A in which the receptor is part of a ligand-gated ion channel complex
- GABA_B metabotropic receptors, which are G protein-coupled receptors that open or close ion channels via intermediaries (G proteins)

GABA has also been detected in peripheral tissues including intestines, stomach, Fallopian tubes, uterus, ovaries, testes, kidneys, urinary bladder, the lungs and liver, albeit at much lower levels than in neurons or -cells.⁵ GABA is also produced at relatively high levels in the insulin-producing -cells of the pancreas.^{6,7} From a whole-body standpoint, inhibitory neurotransmission by GABA has positive effects on neuromuscular relaxation.

SYMPTOMS OF A GABA DEFICIENCY

Low GABA is associated with numerous disorders with a stress component including anxiety disorders, depression, insomnia, migraines, and fibromyalgia. A GABA deficiency is also linked to autism, schizophrenia, bipolar disorder, and epilepsy. While it is possible to have a genetic disorder of GABA metabolism, lifestyle is almost always the underlying cause of a GABA deficiency.⁸

Typical signs and symptoms of GABA deficiency:

- Feelings of dread and tension in the belly for no obvious reason
- Doing many things at once, but at the end of the day have little to show for all the effort Always finding new things to worry about, even when things are going well
- Racing thoughts prevent calm sleep
- Erratic heart beat for no apparent reason
- Leaning on high carbohydrate foods, drugs, or alcohol to relax
- Scattered thinking and increase in lateness and forgetfulness

While there is not yet any conclusive evidence that GABA can pass through the Blood brain Barrier (BBB), it's suspected that certain areas of the brain allow small amounts of GABA to enter^{4,9} and perhaps where there has been damage to the integrity of BBB membranes. GABA may likely bind with receptors found in the peripheral nervous system, rather than those in the brain.¹⁰

Magnesium

Magnesium is an essential dietary mineral that is excellent for stress and anxiety. Unfortunately, deficiency is common, and it's estimated 50% of Americans have subpar levels.¹¹ Magnesium-depleted soils, stress, age, medications, and underlying health conditions all contribute to widespread magnesium deficiency. Magnesium binds to and stimulates GABA receptors in the brain.¹² Common symptoms of magnesium insufficiency are feeling "tired but wired," chronic insomnia, frequent nocturnal leg cramps. Magnesium can suppress hippocampal firing, reducing the release of adrenocorticotrophic hormone (ACTH) and impacting adrenocortical sensitivity to ACTH.¹³ The role of magnesium in the central nervous system is mediated via the N-methyl-d-aspartate-antagonistic, GABA_A-agonistic, or angiotensin II-antagonistic property of this ion.¹⁴

Magnesium chloride is a form of magnesium that can lower anxiety, reduce pain, and help promote restful sleep. Not only is magnesium chloride an effective antimicrobial treatment when given topically, it also delivers magnesium directly into the bloodstream. The skin is an effective way to increase magnesium levels and bypass using the gut – this is especially beneficial for people with IBS (or leaky gut) who suffer from malabsorption of nutrients. Magnesium chloride has also shown to be beneficial for fibromyalgia symptoms.¹⁵

L-Theanine

L-theanine is a uniquely relaxing amino acid found in black, white, green, and oolong teas.¹⁶ L-theanine can cross the BBB and has been shown to increase the levels of GABA, as well as levels of serotonin and dopamine, two other important neurotransmitters.¹⁷ L-theanine is considered an adaptogen, a stress-relieving substance that improves resilience to life stressors.¹⁸

One of the interesting attributes of l-theanine is that it alters brainwave state similarly to that experienced during meditation. The alpha brainwave state is associated with relaxation and the beta state with stress and anxiety. Like GABA, l-theanine increases alpha waves and decreases beta waves.^{19,20} Therapeutically, L-theanine has been used as a relaxant, but it also has potential in the treatment of anxiety and depression.

Beyond its uses in treating CNS disorders, L-theanine has been investigated as both an individual anticancer agent and as a potentiator of the activity of cancer chemotherapeutic agents. L-Theanine also has antioxidant activity that may help to protect normal cells from oxidative damage by these same chemotherapeutic agents.^{21,22,23,24}

The antioxidant properties of L-theanine, as well as reported antihypertensive activities, may contribute to cardiovascular health through attenuating the blood pressure increase in high stress adults.²⁵

Supplementation

Consider topical application of GABAhhh for

- Ease of use application in stressful situations as a less obvious lotion rather than a tablet form
- Fast response when anxiety can lead to panic attacks
- Lower dosing to avoid first pass through the liver
- Increased therapeutic availability in patients with disrupted gut function and poor absorption
- For in-visit use with anxious patients (for example, the elderly and children)

Considerations

GABA is generally considered safe, but too much can result in fatigue, muscle weakness, and shortness of breath. Synthetic GABA should be used carefully with high blood pressure medications since it can cause blood pressure to drop too low. It should be avoided by pregnant or breastfeeding women since its safety in these situations has not been determined.

Each pump of GABAhhh contains: 20 mg GABA, 12 mg L-theanine, 20 mg of magnesium chloride.

Apply to thin areas of the skin, do not exceed 4 pumps per day. May cause drowsiness if used too frequently.

Ingredients: Deionized Water, Caprylic/Capric Triglyceride, Glycerin, Cetearyl Alcohol, Isopropyl Myristate, Stearic Acid, Cetyl Alcohol, GABA, Magnesium Chloride, L-Theanine, Cyclopentasiloxane, Phenoxyethanol, Caprylyl Glycol, Triethanolamine, Xanthan Gum, Lecithin, Ethyl Alcohol, Dimethicone/Vinyl Dimethicone Crosspolymer, Sorbic Acid

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