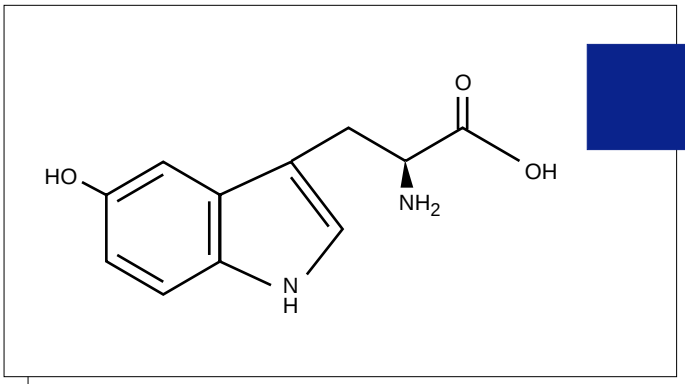

Monograph

5-Hydroxytryptophan

Biochemistry

5-Hydroxytryptophan (5-HTP) is the intermediate metabolite of the amino acid L-tryptophan (LT) in the serotonin pathway. Therapeutic use of 5-HTP bypasses the conversion of LT into 5-HTP by the enzyme tryptophan hydrolase, which is the rate-limiting step in the synthesis of serotonin. Tryptophan hydrolase can be inhibited by numerous factors, including stress, insulin resistance, vitamin B6 deficiency, and insufficient magnesium. In addition, these same factors can increase the conversion of LT to kynurenine via tryptophan oxygenase, making LT unavailable for serotonin production.

5-HTP functions as an antioxidant;[1] whereas, LT can actually promote oxidative damage.[2] 5-HTP is commercially produced by extraction from the seeds of the African plant, *Griffonia simplicifolia*.

Pharmacokinetics

5-HTP is well absorbed from an oral dose, with about 70 percent ending up in the bloodstream.[3,4] Absorption of 5-HTP is not affected by the presence of other amino acids; therefore it may be taken with meals without reducing its effectiveness. Unlike LT, 5-HTP cannot be shunted into niacin or protein production.

Serotonin levels in the brain are highly dependent on levels of 5-HTP and LT in the central nervous system (CNS). 5-HTP easily crosses the blood-brain barrier, not requiring the presence of a transport molecule. LT, on the other hand, requires use of a transport molecule to gain access to the CNS. Since it shares this transport molecule with several other amino acids, the presence of these competing amino acids can inhibit LT transport into the brain.

Mechanisms of Action

5-HTP acts primarily by increasing levels of serotonin within the central nervous system. Other neurotransmitters and CNS chemicals, such as melatonin, dopamine, norepinephrine, and beta-endorphin have also been shown to increase following oral administration of 5-HTP.[5-8]

Clinical indications

Depression: Studies in patients with either unipolar or bipolar depression have demonstrated significant clinical response in 2 to 4 weeks at doses of 50-300 mg three times a day.[9-15]

Fibromyalgia: Fibromyalgia patients have been found to have low serotonin levels, and three clinical trials have demonstrated significant improvement in symptoms, including pain, morning stiffness, anxiety, and fatigue.[16-18]

Obesity: Low serotonin levels in obese patients have been associated with carbohydrate cravings and resultant binge eating. Three studies with 5-HTP in obese patients resulted in decreased food intake and subsequent weight loss.[19-21]

Insomnia: 5-HTP has been shown to be beneficial in treating insomnia, especially in improving sleep quality by increasing REM sleep.[22-24]

Chronic Headache: 5-HTP has been used successfully in the prevention of chronic headaches of various types, including migraine, tension headaches, and juvenile headaches.[16,25-30]

Dosage

Initial dosage for 5-HTP is usually 50 mg three times a day with meals. If clinical response is inadequate after two weeks, dosage may be increased to 100 mg three times a day. For insomnia, the dosage is usually 100-300 mg before bedtime. Because some patients may experience mild nausea when initiating treatment with 5-HTP, it is advisable to begin with 50 mg doses and titrate upward.

Drug-Nutrient Interactions

Although no reports have been published, it is possible that 5-HTP, when taken in combination with a selective serotonin reuptake inhibitor (SSRI) antidepressant such as Prozac, Paxil, or Zoloft, may cause a condition known as serotonin syndrome. This syndrome is characterized by agitation, confusion, delirium, tachycardia, diaphoresis, and blood pressure fluctuations.

Contraindications

The primary concern regarding 5-HTP is the possibility of an eosinophilia-myalgia syndrome (EMS) similar to the illness linked to contaminated LT. The contamination identified in certain batches of LT has been related to production methods using bacterial fermentation and subsequent inadequate filtration. This is unlikely to occur with 5-HTP, since it is produced by extraction from plant sources. Two cases of EMS-like symptoms have been described in patients taking 5-HTP. One case reported in 1980 involved the use of very high doses (1400 mg daily).[31] Because contamination of LT was not identified as a factor in EMS until 1990, the product consumed by this patient was not tested for contamination. The second case involved a mother and two children who were confirmed to have taken contaminated 5-HTP.[32]

5-HTP should not be used in patients currently being treated or who have recently been treated with an SSRI antidepressant.

Side Effects

Some patients may initially experience mild nausea when taking 5-HTP.

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