stored in ceramic or lead containers, as lead can leach into the tea.

ADVERSE REACTIONS

Those who drink more than 4 ounces daily of kombucha tea frequently experience nausea, vomiting and headaches. There have been reports of allergic reactions, jaundice, and head and neck pain. There are reports of two women with unexplained metabolic acidosis following use of kombucha tea. One died. However, it was unclear whether the kombucha tea had any role in causing the metabolic acidosis. Another 115 people who made tea from the same batch of kombucha had no adverse reactions. There are a few reports of elevated serum liver tests and a report of lead poisoning from drinking kombucha tea prepared in a ceramic pot. A case of cutaneous anthrax associated with kombucha has been reported, possibly secondary to contamination of the tea during its preparation.

OVERDOSAGE

There are no reported cases of overdosage with kombucha.

DOSAGE AND ADMINISTRATION

There is no typical dosage and no recommended dosage.

LITERATURE

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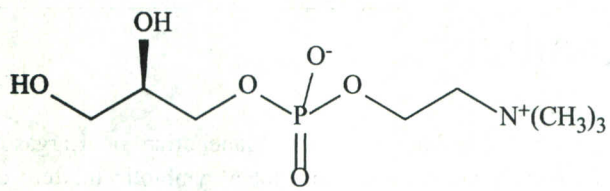
L-Alpha-Glycerylphosphorylcholine (Alpha-GPC)

DESCRIPTION

L-alpha-glycerylphosphorylcholine is a substance derived from soy lecithin. It is phosphatidylcholine without the two fatty acid chains contained within the phosphatidylcholine structure. Although it is popularly referred to as a phospholipid, it is not. It is a phospholipid-derived substance.

Alpha-GPC has the following structural formula:



L-alpha-glycerylphosphorylcholine

L-alpha-glycerylphosphorylcholine is either abbreviated as alpha-GPC or GPC. It is also known as choline alfoscerate; choline-glycerophosphate, and choline-hydroxide, (R)-2,3-dihydroxypropyl hydrogen phosphate, inner salt. Alpha-GPC is believed to be a delivery form of choline (see Choline).

ACTIONS AND PHARMACOLOGY

ACTIONS

Alpha-GPC is a putative cognition enhancer and a putative growth hormone secretagogue.

MECHANISM OF ACTION

The actions of supplemental alpha-GPC are speculative and, therefore, any proposed mechanism of action is likewise speculative. Alpha-GPC is a delivery form of choline, and choline can be metabolized to acetylcholine. Some with Alzheimer's disease may suffer from a cholinergic defect, and, theoretically, a delivery form of choline may positively affect some with cognition disorders in which there exists a cholinergic deficit. In a similar speculative vein, it is known that cholinergic potentiation may modulate the growth hormone (GH) response to the hypothalamic hormone GHRH or growth hormone releasing hormone. Again, if alpha-GPC is a significant precursor of acetylcholine, it may have a GH secretagogue effect.

PHARMACOKINETICS

Some pharmacokinetic data are available from animal studies. Human pharmacokinetic data are lacking. It is unclear as to how much of an ingested dose of alpha-GPC gets into the brain or, for that matter, how much choline from a dose of ingested alpha-GPC gets to the brain.

INDICATIONS AND USAGE

It has been claimed that alpha-GPC is indicated for situations in which increased human growth hormone secretion is desirable and for the treatment of cognitive disorders. Evidence is insufficient to warrant support for either of these claimed indications at this time.

RESEARCH SUMMARY

The claim has been made that this putative acetylcholine precursor encourages the body to secrete increased levels of human growth hormone. There is some preliminary evidence that this is so, but whether this has any therapeutic significance remains to be seen. Safety data are also lacking. Claims that alpha-GPC is helpful in the treatment of cognitive disorders in the elderly are based upon scant and preliminary findings which, nonetheless, may warrant further investigation.

CONTRAINDICATIONS, PRECAUTIONS, ADVERSE REACTIONS

CONTRAINDICATIONS

Alpha-GPC is contraindicated in those who are hypersensitive to any component of the preparation.

PRECAUTIONS

Because of lack of long-term safety data, children, pregnant women and nursing mothers should avoid use of alpha-GPC.

ADVERSE REACTIONS

To date, no adverse reactions have been reported.

INTERACTIONS

There are no known drug, nutritional supplement, food or herb interactions.

OVERDOSAGE

There are no reports of overdosing.

DOSAGE AND ADMINISTRATION

Those who use alpha-GPC take 500 milligrams to 1 gram daily. About 40% of alpha-GPC is choline.

LITERATURE

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L-Arginine

DESCRIPTION

L-arginine is a protein amino acid present in the proteins of all life forms. It is classified as a semi-essential or conditionally essential amino acid. This means that under normal circumstances the body can synthesize sufficient L-arginine to meet physiological demands. There are, however, conditions where the body cannot. L-arginine is essential for young children and for those with certain rare genetic disorders in which synthesis of the amino acid is impaired. Some stress conditions that put an increased demand on the body for the synthesis of L-arginine include trauma (including surgical trauma), sepsis and burns. Under these conditions, L-arginine becomes essential, and it is then very important to ensure adequate dietary intake of the amino acid to meet the increased physiological demands created by these situations.

L-arginine, even when it is not an essential amino acid as defined above, is a vital one. In addition to participating in protein synthesis, it plays a number of other roles in the body. These include the detoxification of ammonia formed during the nitrogen catabolism of amino acids via the formation of urea. In addition, L-arginine is a precursor in the formation of nitric oxide, creatine, polyamines, L-glutamate, L-proline, agmatin (a possible neurotransmitter in the brain) and the arginine-containing tetrapeptide tuftsin, believed to be an immunomodulator. L-arginine is a glycogenic amino acid; it can be converted to D-glucose and glycogen if needed by the body or it can be catabolized to produce biological energy.

L-arginine, when administered in high doses, stimulates pituitary release of growth hormone and prolactin and pancreatic release of glucagon and insulin. Intravenous L-arginine may be used as an aid in the evaluation of problems with growth and stature that may be due to growth hormone deficiency. Intravenous arginine hydrochloride may be used as a fourth-line agent in the treatment of severe metabolic alkalosis. L-arginine is also used as an immunonutrient in enteral and parenteral nutrition to help improve the immune status in those suffering from sepsis, burns and trauma.