

Acetyl-L-Carnitine

Overview

Acetyl-L-carnitine (ALC), an esterified form of L-carnitine, is one of the most common metabolites of carnitine present naturally in humans and mammals' plasma and tissue¹⁻².

ALC is readily convert into carnitine and acetyl-CoA back in mitochondria according to the metabolic needs of the cell. It is absorbed from the gut and actively crosses the blood-brain barrier². L-carnitine acts as a transporter of long-chain fatty acids between cytoplasm and mitochondria for β -oxidation³⁻⁴.

Growing clinical evidence supports multiple health benefits of ALC on cognitive functions and various neurological disorders.



Key indications



Mild cognitive impairment

Taking 1.5g to 2g of ALC daily for at least 3 months may improve memory and intellectual functions as resulted in better scores in clinical and psychometric assessment scales in older people with memory deficits compared to those in the placebo groups⁹.



Depression

Depressed patients have higher total cortisol secretion possibly attributed by heightened activation of the hypothalamic-pituitary-adrenocortical (HPA) axis¹⁰. Daily consumption of 500mg of ALC, 3 times daily for 2 months may significantly improve mood and counteracting depression symptoms in elderly with depressive disturbance as measured by decreased scores in the Hamilton Rating Scale for Depression¹¹.



Alzheimer's Disease

As ALC levels are declined in many forms of dementia, daily supplementation of ALC may improve spacial learning tasks, timed tasks of attention, discrimination-learning tasks and personal recognition tasks. Reduction in deterioration of reaction time and short-term memory associated tasks have also been observed⁵⁻⁷. Long term memory performance and delay in behavioural deterioration are recorded after one-year administration of 1g to 2g of ALC⁸.



Male infertility

Consumption of 1g to 3g of ALC (alone and in combination with 2g of L-carnitine) may increase sperm morphology and total and forward sperm mobility in males with fertility problems in 6 months¹²⁻¹³. Result is more significant in men receiving the combination therapy¹³.

Adverse effects¹⁴⁻¹⁵

ALC is generally well tolerated for most people without incidence of significant side effects even with long term administration. The most common adverse reactions include stomach upset, nausea, vomiting, dry mouth, headache, and restlessness. "Fishy" odour of urine, breath and sweat may possibly be observed in some individuals.

Dosage range

Typical doses used in clinical trials are in the ranging from 1g - 3g daily.

Contraindications/cautions¹⁴⁻¹⁵

- ALC might worsen symptoms or interfere with the drugs and hormone in people with the following diseases or condition.
 - Bipolar disorder
 - Chemotherapy-induced peripheral neuropathy
 - Underactive thyroid (hypothyroidism)
 - Seizures
- Be cautious when you are taking these drugs and supplements as interaction may occur:
 - Acenocoumarol (Sintrom)
 - Warfarin (Coumadin)
 - Serotonergic drugs
 - Thyroid hormone
 - D-carnitine
 - Herbs and supplements with serotonergic properties
- Safety data on pregnancy and breast-feeding has not been established.

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