Carnitine Research

Carnitine Increases Fat Burning

Research shows L-Carnitine significantly increases fatty acid oxidation in healthy adults.

Dose: 3 grams (3,000 mg) for ten days

One gram, three times per day

Significant increase in palmitic acid oxidation seen by increase in 13CO2 exhalation

Carnitine Increases Fat Burning

This is the first investigation to conclusively show that oral L-Carnitine supplementation stimulates in vivo long chain fatty acid metabolism.

This increase in fat burning occurred in subjects without carnitine deficiency

Metabolism Vol 51, No 11: 1389-91, 2002

Carnitine Benefits

Supports Immune Function

Supports Male Sexual Health as well as Testosterone

Increases Energy Naturally

Supports Weight Loss

Increases Lean Tissue

Lowers Cholesterol and Triglycerides and Free Fatty Acid Levels in blood

Promotes Heart Health

Supports ADHD and Chronic Fatigue

Carnitine and Older Adults

A placebo-controlled, randomized, double-blind, two-phase study.

84 elderly subjects with onset of fatigue following slight physical activity were recruited

One group (42) received carnitine 2g twice daily and the other (42) a placebo for 30 days.

Carnitine Helps Older Adults

At the end of the study, compared with placebo, the carnitine-treated patients showed significant improvements in the following parameters:

Total fat mass (-3.1 vs -0.5 kg)

Total muscle mass (+2.1 vs +0.2 kg)

Total cholesterol (-1.2 vs +0.1 mmol/L)

LDL-C (-1.1 vs -0.2 mmol/L)

HDL-C (+0.2 vs +0.01 mmol/L)

Triglycerides (-0.3 vs 0.0 mmol/L)

Carnitine Helps Older Adults

Fatigue decreased significantly by 40% Mental fatigue decreased by 45% in subjects taking carnitine, compared with

11% and 8%, respectively, in the placebo group

No adverse events were reported in any treatment group

Carnitine Helps Older Adults

Administration of carnitine to healthy elderly subjects resulted in a:

Reduction of total fat mass

An increase of total muscle mass, and

Exerted a favorable effect on fatigue and serum lipids.

Pistone G et al. Drugs Aging. 2003;20(10): 761-7.

Carnitine versus androgen administration in the treatment of sexual dysfunction, depressed mood, and fatigue associated with male aging

A Landmark Paper

***Urology*. 2004 Apr;63(4):641-6.**

Carnitine and Andropause

A total of 120 patients were randomized into three groups. The mean patient age was 66 years (range 60 to 74). Group 1 was given testosterone undecanoate 160 mg/day, the second group was given propionyl-L-carnitine 2 g/day plus acetyl-L-carnitine 2 g/day. The third group was given a placebo (starch).

Carnitine and Andropause

RESULTS: Testosterone and carnitines significantly improved the peak systolic velocity, end-diastolic velocity, resistive index, nocturnal penile tumescence, International Index of Erectile Function score, Depression Melancholia Scale score, and fatigue scale score.

Carnitine and Andropause

Carnitines proved significantly more active than testosterone in improving nocturnal penile tumescence and International Index of Erectile Function score.

Testosterone significantly increased the prostate volume and free and total testosterone levels and significantly lowered serum luteinizing hormone; carnitines did not. Negligible side effects emerged.

CONCLUSIONS: Testosterone and, especially, carnitines proved to be active drugs for the therapy of symptoms associated with male aging.

Carnitine in Centenarians

Sixty-six centenarians with onset of fatigue after even slight physical activity were recruited to the study.

The 2 groups received either 2 g L-Carnitine once daily (n = 32) or placebo (n = 34).

Carnitine in Centenarians

At the end of the study period, the L-Carnitine-treated centenarians, compared with the placebo group, showed significant improvements in the following markers: total fat mass (-1.80 compared with 0.6 kg; $P < 0.01$), total muscle mass (3.80 compared with 0.8 kg; $P < 0.01$), and plasma concentrations of carnitines.

Carnitine in Centenarians

Significant differences were also found in physical fatigue, mental fatigue, especially fatigue severity, and overall cognitive function.

This study indicates that L-Carnitine reduces total fat mass, increases total muscular mass, and facilitates an increased capacity for physical and cognitive activity by reducing fatigue and improving cognitive functions.

Am J Clin Nutr. 2007 Dec;86(6):1738-44.

Carnitine Supports Weight Loss

A 4-week study on 100 adipose patients was carried out to determine if carnitine in a diet of 1200 kcal/day (almost meatless) can support weight loss as compared to the same diet without carnitine.

Patients were given a low-calorie diet: carbohydrates: 50-55%; fat, 30-35%; and protein 15%.

Polyunsaturated to saturated ratio: 2:1.

Medical Journal for Natural Therapy,39,1 (1998). pp.12-15

Carnitine and Weight Loss

Both groups were prescribed a program of activity therapy.

Group receiving carnitine 1 g/3x/day

Body weight reduced in carnitine group by 10 lbs and BMI by 1.50 points.

In diet only group an average weight loss of 7.5 lbs and BMI dropped 1.22 points.

Carnitine and Weight Loss

Study: 18 overweight adolescent subjects between ages 13-17 were divided in two groups of 9 for a three month trial.

Both given multivitamin, similar prudent diet, and both performed a moderate amount of aerobic exercise. Both were educated about the effects of nutrition on health

One group given 2,000 mg of L-Carnitine per day, the other a placebo.

Carnitine and Weight Loss

Results: L-Carnitine group experienced an average weight loss of 11 lbs while the placebo group lost an average of only 1 lb. L-Carnitine group also experienced better loss of body fat and an increase in lean body mass

Weight loss in carnitine group came from increased loss of body fat

Carnitine Research

Zhi-Qian He et al. Acta Nutrimenta Sinica 1997; Vol 19, No.2.

Carnitine improves insulin sensitivity

Glucose uptake improved in 15 diabetics given carnitine

JACN 18 (1): 77-82, 1999.

Carnitine and the Heart

The heart derives 70% of its energy from fat

Carnitine is essential for heart health

Carnitine also supports healthy blood fat levels to keep coronary arteries healthy

Cholesterol Levels and L-Carnitine

Blood cholesterol values before and after treatment with L-Carnitine (2g/day) for 6 months (Cacciatore et al, 1991)

L-Carnitine and Dyslipidemic Patients

Study: 26 dyslipidemic patients received 3 g of carnitine for 40 days and were then examined for total cholesterol, HDL cholesterol, triglycerides, lipoprotein, and “risk index”(total cholesterol by HDL)

Results: Patients showed significant decreases in all the lipid components after carnitine administration and a significant decrease of the cholesterol risk index.

Triglycerides dropped markedly.

Current Therapeutic Research, Vol. 27, No. 2, February 1980

Lipid Lowering Effects

Carnitine administration significantly reduced TG concentration and slightly reduced total cholesterol.

Body weight remained unchanged.

No side effects reported as they commonly are during use of antilipemic drugs

The Lancet, October 14, 1978, p. 805-807.

Carnitine Enhances Endurance and Speed

Elite Runners given 3g of carnitine per day

Improved peak running speed 5.7%

Swart et al, Nutrition Research, 1997.

L-Carnitine and Pregnancy

There appears to be an increased carnitine need during pregnancy

American Journal of Clinical Nutrition 44: Sept. 1996, p. 379-383.

Acetyl-L-Carnitine: Four Roles

Improves cholinergic neurotransmissions

Optimizes intracellular energetics

Raises growth factors (such as nerve growth factor-NGF)

Repairs membrane receptors (such as the NMDA receptor)

Acetyl L-carnitine (ALCAR) treatment in elderly patients with fatigue

Malaguarnera M et al. Arch Gerontol Geriatr. 2008 Mar-Apr;46(2):181-90.

96 aged subjects (>70 years, range 71-88) were investigated

Given 4 grams ALCAR/day for 90 days

Acetyl L-carnitine (ALCAR) treatment in elderly patients with fatigue

By the end of the treatment, significant differences between the two groups were found for the following parameters: muscle pain -27% versus -3% ($p<0.05$); prolonged fatigue after exercise: 51% versus -4% ($p<0.0001$); sleep disorders: 28% versus 4% ($p<0.05$); physical fatigue: 7 versus -0.5 ($p<0.0001$)

Acetyl L-carnitine (ALCAR) treatment in elderly patients with fatigue

Changes in mental fatigue: -3.3 versus 0.6 ($p<0.0001$); fatigue severity scale: -22.5 versus 1.2 ($p<0.0001$); functional status 17.1 versus 0.6 ($p<0.0001$); mini mental state examination (MMSE) improvements: 3.4 versus 0.5 ($p<0.0001$).

Dramatic improvement on ALCAR therapy

ALCAR Decreases Pain in Fibromyalgia

Clin Exp Rheumatol. 2007 Mar-Apr;25(2):182-8.

Double-blind, multicenter trial comparing acetyl l-carnitine with placebo in the treatment of fibromyalgia patients.

Rossini M et al.

ALCAR Helps Dysthymia

Eur Neuropsychopharmacol. 2006 May;16(4):281-7.

A double-blind, randomised, controlled clinical trial of acetyl-L-carnitine vs. amisulpride in the treatment of dysthymia.

Zanardi R, **Smeraldi E**.

ALCAR and Diabetic Neuropathy

333 patients, 2 g/day, 1 year's duration

ALCAR significantly reduced pain

Drugs R D. 2002;3(4):223-31.

Acetyl-L-carnitine in the treatment of diabetic neuropathy. A long-term, randomised, double-blind, placebo-controlled study.

Carnitines and Male Infertility

Both Carnitine and ALCAR help male infertility Dose 2-4 grams/day

Carnitines improve sperm kinetic features and pregnancy rate

Asia Pac J Clin Nutr. 2007;16 Suppl 1:383-90.