

# New Uses For Carnitines

***"New data supports the use of L-carnitine & acetyl L-carnitine to increase energy and as an alternative to testosterone for the baby boomers."***

Based on some new research, let's consider new uses for the amino acid L-carnitine and acetyl L-carnitine. The amino acid L-carnitine is a major player in energy production. Think of carnitine like a forklift that carries long chain fatty acids across the inner mitochondrial membrane to be used as energy. In humans, carnitine is synthesized in the liver, kidney, and brain from lysine and methionine and actively transported to other areas of the body. Theoretically, we get enough carnitine from animal based diets. However vegetarians, people with digestion/absorption issues, cofactor deficiencies, chronic fatigue, blood sugar issues or senior citizens can often benefit from carnitine supplementation.

Let me give you an example. A study with 120 males, with a median age of 66, was broken into 3 groups. Group one was given the hormone of desire, testosterone. Group two was given 2 grams of L-carnitine and 2 grams of acetyl-L-carnitine. Group three was given a placebo. The study lasted 6 months. Prior to the study the men demonstrated decreased libido and erectile quality, depressed mood and intellectual



concentration ability, irritability, fatigue and free testosterone lower than 6 pg/ml (normal range is 8.7-54.7).

Here is how the authors of the study described the results. "Testosterone and carnitine 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.

Carnitines proved significantly more active than testosterone in improving nocturnal penile tumescence and international index of erectile function score. Testosterone significantly in-

creased the prostate volume and free and total testosterone and significantly lowered serum luteinizing hormone, carnitines did not.

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

You can see a link below on natural ways to raise testosterone.

Dr. Vasquez shares an interesting point. "Despite the fact that they were fatigued, depressed, and hypogonadal, carnitine at 4 grams per day proved more effective than testosterone. Of additional note, this article re-

peatedly and uniquely emphasized that 'carnitines serve, via promotion of acetyl groups into Krebs cycle, to enhance ATP production and reduce ROS production."

Dr. Vasquez continues to drop mind grenades as he articulates the molecular basis for inflammation and states one of the biggest reasons, beyond hidden infections, for inflammation is blood sugar dysregulation.

You can see a link below for two webinars on the molecular basis of inflammation.

He maintains that consuming processed high carbohydrate refined foods and having hyperglycemia or diabetes creates a pro-inflammatory state through multiple mechanisms. Blood sugar problems are associated with an acidic chemistry, mineral depletion, oxidative stress, cell membrane permeability issues, hypoxia, etc.

But let's come back to L-carnitine and acetyl L-carnitine and see how the combination of these two forms can break inflammatory cycles. Sustained hyperglycemia and hyperinsulinemia cause increases in palmitic acid which cause an increase in ceramides. Ceramides are a group of "waxy" lipids that are involved in cell signaling, differentiation, proliferation and programmed cell death. Ceramides accumulate with time and age and are promoted when consuming an overload of processed food. An increase in ceramides cause both mitochondrial dysfunction and endoplasmic reticulum stress.

By the way, in the future you'll hear a lot about ERS or endoplasmic reticulum stress. It's the next "hot frontier". ERS results in unfolded proteins which result in metabolic inflammation. It looks like the main cause of ERS comes from, hyperglycemia and hyperinsulinemia. So sugar dysregulation causes a buildup of the waxy lipids called ceramides which contribute to both mitochondrial dysfunction and ERS. Our patients clinically experience fatigue and systemic inflammation.

Benjamin Bikman from Brigham Young University believes ceramides are the key to losing weight and fighting diabetes. You can see him on YouTube describing his findings.

Fats called ceramides build up in cells, damage mitochondria and lead to obesity and diabetes. Bikman reports that inhibiting ceramides could prevent weight gain and diabetes in animal models, even when the animals were given high fat, high sugar diets.

Bikman reports that ceramides cause long connected strands of mitochondria to separate and the smaller damaged mitochondria aren't as efficient at burning energy which leads to weight gain. Although no ceramide inhibitor is currently available for humans, Bikman says diet and exercise have also been shown to inhibit ceramide.

Dr. Vasquez points out that there is an enzyme that naturally reduces ceramide called ceramidase. In other words ceramidase breaks the cycle. What is exciting is that ceramidase can be up regulated by increasing L-carnitine and acetyl-L-carnitine."

Understand I am leaving out a whole lot of background science in these statements. You can see Dr. Vasquez's webinar to hear a deeper discussion and other nutrients to support both mitochondrial dysfunction and ERS.

The point I want to emphasize is that we have new data to support the use of L-carnitine and acetyl L-carnitine to increase energy and as an alternative to testosterone for the baby boomers. And it may be the missing key to weight loss for that resistant population.

Biotics makes a product called Acetyl-L-Carnitine in 500 mg capsules. L-Carnitine comes in a powder called L-Carnitine Powder. Use 2 grams of each preferably between meals.

Thanks for reading this week's edition of the Tuesday Minute. I'll see you next Tuesday.