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EFFECTIVENESS OF L-CARNITINE IN THE CORRECTION OF CARDIOVASCULAR RISK FACTORS

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Abstract: Cardiovascular disease is a major health concern that leads to the high death risk, fueled by factors like obesity, glucose levels, and lipid levels. This study investigated L-carnitine's potential in managing these risk factors.

Keywords: cardiovascular risk, L-carnitine, obesity, dysglycemia, dyslipidemia.

Cardiovascular (CV) disease is the leading cause of death worldwide, claiming an estimated 17.9 million lives each year. Many factors play a role in the occurrence of CV events, with obesity, elevated blood glycemia, and lipids being among the main ones. Obesity is associated with an 8-fold increase in the high risk of coronary heart disease in women ($p<0.001$) as well as a 1.4-fold increase in men ($p=0.095$). [1] Moreover, patients with elevated glucose levels below the threshold for diabetes had a 30% higher risk of developing CV disease. [2] Studies also show that elevated levels of triglycerides and low-density lipoprotein are associated with an increased risk of mortality from CV disease ($p=0,01$).[3] Among the large arsenal of traditional and adjunctive means of correction of CV risk factors, L-carnitine deserves special attention, as it can simultaneously affect several factors, according to some studies.

The study aimed to analyze the effect of L-carnitine on glycemia, overweight, obesity, and lipid profile.

A meta-analysis of the results of international clinical trials on the effect of

L-carnitine on clinical and laboratory parameters in patients with overweight, obesity, type 1, and type 2 diabetes mellitus was conducted. PubMed, EMBASE, and Cochrane Library databases were used for the analytical review. The data were considered reliable at p-value < 0.05.

According to the results of the meta-analysis, L-carnitine 2000 mg reduced fasting glycemia in patients with type 2 diabetes mellitus after taking L-carnitine for 3 months – glucose levels decreased from an average of 8.2 mmol/L to 7.3 mmol/L (p=0.00001). The level of glycated hemoglobin also decreased: from 7.8% to 7.4% (p=0.00001) within 3 months and to 7.2% (p=0.00001) within 6 months. [4]

Regarding studies on the effect of L-carnitine supplementation on body mass index and weight, the meta-analysis showed that L-carnitine consumption at a dosage of 2000 mg significantly reduced body weight (-1.21 kg, p = 0.001), body mass index (-0.24 kg/m2, p = 0.001) and fat mass (-2.08 kg, p = 0.003), but no statistically significant effect on waist circumference was found. L-carnitine supplements seemed to work best at a dose of 2000mg per day for reducing body weight in adults, with no clear benefit for BMI, waist circumference, or body fat percentage. [5]

L-carnitine has no less impact on the lipid spectrum of blood. There was a significant decrease in triglycerides (TG) and low-density lipoprotein (LDL) (-0.29 mmol/L and -0.23 mmol/L, respectively) while taking L-carnitine in a dosage of 1001-2000 mg. In a subgroup of patients with type 2 diabetes mellitus, a decrease in TG and LDL cholesterol by -0.26 mmol/L and -0.18 mmol/L, respectively, was observed. Whereas in patients with type 1 diabetes mellitus, an improvement in such indicators as TG, LDL, and high-density lipoprotein was found (-1.26 mmol/L, -1.45 mmol/L, and 0.43 mmol/L, respectively). These data indicate a significant effect of L-carnitine intake at a dosage of 2 g daily on the blood lipid spectrum, especially in patients with type 1 diabetes mellitus (p < 0.02). [6]

Not enough research has been done to figure out the best amount of L-carnitine to take for glucose level and cholesterol. So, researchers looked at several studies to see if the dose mattered. Most of the studies (11 out of 17) gave people 2000mg of L-carnitine per day. When people took between 1001mg and 2000mg, it seemed to

help lower their fasting glucose, A1c, total cholesterol, LDL-C, and triglycerides. But taking less or more than that didn't have any significant effect.

Conclusions: Given the above data, it can be concluded that it is advisable to prescribe L-carnitine to patients who have major risk factors for CV events, such as obesity, elevated levels of fasting glucose, low-density lipoprotein, and triglycerides.

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