

ORIGINAL ARTICLE

Adjuvant Supplementation with L-Carnitine in Diabetic Population and its effects on Lipid Parameters

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ABSTRACT

Background: Diabetes is a complicated disease requires continuous clinical care, to govern blood sugar.

Aim: To decide the impact of management of L carnitin to diabetics at the lipid profile.

Methods: This study turned into performed on 120 diabetic Patients had been decided on from endocrinology and diabetes, inside decided on standards. The Patients distributed into three Strata (1st Strata of healthy population and two Strata of patients with diabetes who were on metformin and glibenclamide, one Strata took a L carnitine in a dose of 1000 mg TDS and a Strata dealing with a placebo for a period of ninety days).

Results: It is observed those who are on Lcarnitine, confirmed a large discount ($p < 0.05$) with inside the triglyceride level, at the same time as no large adjustments had been located withinside the level of cholesterol and HDL and LDL.

Conclusion: These study outcomes that management of L carnitin improved profile of lipid in type-2diabetic Patients.

Keyword: Dyslipidemia, Diabetes mellitus (DM), L-carnitine (LC).

INTRODUCTION

Diabetes mellitus (DM) is a international health problem affecting children and adults. According to the World Health Organization, about one hundred eighty million humans global presently have type 2 DM ; over 95% of humans with diabetes have this form (1). World Health Organization (WHO) has currently proposed diagnostic standards and category of diabetes mellitus. A important alternate in diagnostic standards is reducing of diagnostic fasting plasma glucose level to much less than 6mM/L⁹. It is related to long-time period damage, dysfunction, and failure of various organs⁸, Diabetes is related to each micro vascular and macro vascular sicknesses affecting numerous organs, which includes muscle, skin, heart, brain, and kidneys². The type 1 and type 2 are used for category primarily based totally on etiology. The insulin dependent and non-insulin dependent are used for pathophysiological staging of diabetes mellitus irrespective of the etiology¹¹. The occurrence of diabetes for all ages globally turned into envisioned being 2.9% in 2002 and 3.9% in 2025. The diversity of humans with diabetes is growing because of populace growth, aging , urbanization¹² and growing occurrence of weight problems and bodily inactivity. L-Carnitine is a herbal nutrient cofactor required for delivery of long-chain fatty acids into the mitochondria, wherein they go through beta-oxidation to supply adenosine triphosphate for cell power manufacturing that's number one gasoline supply for correct characteristic in lots of tissues and save the poisonous accumulation of long-chain fatty acids⁸.

ole of L- Carnitine with inside the Type 2DM Patients:

Type 2 diabetes appear to be at accelerated danger for carnitine deficiency⁷. L-Carnitine can play a function within the remedy of type 2 diabetics via way of means of enhancing insulin resistance this is due to post-receptors disorder, which means that L- Carnitine can be beneficial for cellular membrane repairing and, elimination of dangerous lipid from the cells might also additionally enhance or lower the resistance to insulin movement via way of means of photoreceptor disorder both on the membrane or intracellular level¹¹, Administration of L- Carnitine might also additionally shift the metabolic bias of the liver far from esterification and synthesis of triglycerides towards the formation of acetylcarnitines. This ought to lower synthesis of triglycerides and VLDL ldl cholesterol and probable boom mitochondrial β -oxidation of fatty acids¹².

MATERIALS AND METHODS

This observe turned into executed on the Specialized Center of Endocrinology and Diabetes Rashid Latif Medical College Lahore. The observe turned into performed -on 120 patients 82 male and 38 females with age variety 30 to 60 non- randomized method, all volunteers observe inclusion and exclusion standards. The inclusion and exclusion standards for volunteers: The inclusion standards for wholesome patients should not suffered from any other chronic disorder or drugs, at the same time as diabetic Patients to be unmanaged type 2DM for at the least 2 years and more, on metformin and glibenclamide remedy, and had lipid profile disorder, at the same time as this observe exclude the pregnant, breast feeding or on contraceptive and postmenopausal women, additionally

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people with liver disorder, kidney disorder, epileptic disorder, thyroid disorder, smokers, and alcohol drinkers additionally ought to don't have any contamination or on anti-biotic or some other drug has interplay with L-Carnitine. The volunteers are divided into 3 Strata as follows:

Strata 1: Includes 40 healthy subjects.

Strata 2: encompass 40 diabetic Patients this Strata turned into taken L- Carnitine (1000 mg) capsules every day for ninety days.

Strata 3: Includes 40 diabetic Patients were treated with placebo for ninety days.

Blood samples had been taken from all people on this study, at bottom line time and each month of the observe length, blood collected via way of means of venipuncture method for you to level serum lipid profile. Statistical evaluation turned into done via way of means of the use of T-Test among wholesome people and diabetic patients, and T- check among 0 time, after 30days,60days and 90days in all Strata concerned on this observe.

RESULTS

Table 1 indicates the impact of L- Carnitine at the lipid profile, involving overall ldl cholesterol (TC), triglyceride (TG) ,excessive density lipoprotein (HDL)and occasional density lipoprotein(LDL) .The contrast among control strata with diabetics Strata confirmed a large distinction with inside the TC,TG and LDL at the same time as HDL non-notably affected. Concerning the TC, the final results of trial confirmed non- large adjustments located with inside the dealt with strata in addition to placebo throughout observe length ,in the meantime the records expressed a large discount of serum TG from 1st month in contrast with baseline value, at ($p<0.05$) and exceedingly large on the 2d month and third month respectively. For excessive density lipoprotein (HDL) the desk indicates non- large additionally low density lipoprotein (LDL) confirmed non-large adjustments on the three month of the observe length climate in dealt with strata or placebo.

Table (1) The effect of treatment with L-Carnitine on lipid profile in T2DM patient (n=40).

Parameter Strata	Regime	Total Cholesterol mg/dl	Triglyceride mg/dl	HDL mg/dl	LDL mg/dl
Control	reference point	170.3±44.2	160.6±44.8	39.01±6.02	88.6±14.44
Placebo	Reference point	208.9±30.8	178.2±50.1	40.72±7.44	127.±28.2
	1month	270.53±33.6	178.6±55.6	39.1±6.29	145.3±27.2
	2month	208.4±39	177.6±49.2	39.98±7.58	126.5±25.6
	3month	207.37±21.2	173.2±35.6	40.01±5.25	124.9±17.2
Treatment with L-Carnitine	Reference point	210.4±26.2	179.4±40.5	41.06±7.2	122.2±24.7
	1month	222.104.5	168.4±32.1	40.2±6.33	124.2±22.6
	2month	209.6±23.5	159±27.2 *	42.03±6.15	128.±22.6
	3month	202.6±29.3	148.9±27.5*	40.2±6.05	121.3±22.4

Significant change (p value <0.05) for patients comparison between pre and post treatment values of treated Strata.

DISCUSSION

The contemporary observe proven a non-large decline in Total LDL cholesterol, the serum HDL-C (excessive density lipoprotein ldl cholesterol) and LDL-C (low density lipoprotein LDL cholesterol) levels withinside the dealt with strata after one, and ninety days of remedy in contrast with 0 time readings, and this can be because of a truth that L-Carnitine don't have direct amazing impact at the LDL cholesterol synthesis pathway, or the length of trial now no longer enough to examine this sort of alternate this remark turned into constant with that acquired via way of means of Gonzalez-Ortiz(2008)¹², Golbidi (2011)¹³ and Roberto(2012)¹⁵, however, those findings disagree with different research who located superb outcomes of L-Carnitine supplementation on overall LDL cholesterol^{14,17},

at the same time as Irat et al. (2003) cautioned that the useful outcomes of L-Carnitine remedy partly enhance vascular reactivity and antioxidant assets past its discount of plasma lipids and it could have an vital healing method withinside the remedy of diabetic vascular headaches¹⁸ additionally it don't forget an excellent adjuvant remedy beside ldl cholesterol-reducing tablets (statin) for its mechanism that opposite the myopathy that's viable aspect impact of ldl cholesterol reducing tablets and potentiated statin impact¹⁹ additionally the LC might also additionally has an qualitative impact on HDL The gift observe observed a hit development and large decline in Triglyceride level with inside strata in contrast with bottom line readings, and this can be because of the L-Carnitine outcomes on FFA metabolism, glucose hemostasis, development in insulin sensitivity, down-regulated enzymes

critical in glycolipid biosynthesis and had been up-regulated Enzymes concerned in fatty acid catabolism²² or its function in boom FA intake thru boom bodily activity. This final results of the prevailing observe disagrees with different research which discover no such distinction in TG level after taking L- Carnitine²²⁻²⁴ at the same time as different research believe this observe final results²⁵.

CONCLUSION

The observation turned into finish that management of L- Carnitine as adjuvant complement at a dose (1000mg) two times every day for three successive months had a gain impact on the triglyceride level with inside the T2DM with dyslipidemia in the meantime non-large adjustments had been located at the levels of TC,HDL,LDL.

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