

**The effects of L-carnitine administration on lipid metabolism in streptozotocin-induced diabetic rat.**

Young-Ran Heo\*, Yeoul Lee, Chang-Won Kang<sup>1</sup>, Youn-Soo Cha, Department of Food and Nutrition, and Institute for Molecular Biology and Genetics, Department of Veterinary Medicine and Bio-safety Research Institute<sup>1</sup>, Chonbuk National University

It is well known that carnitine play an important role in fat metabolism in body. It reduces blood and tissue lipid accumulation in various conditions, including cardiovascular disease and chronic alcoholism. Several studies have been reported that marked alteration on lipid metabolism in diabetes is associated with decreased carnitine concentrations.

In this study, we investigate the effects of L-carnitine administration on lipid metabolism in streptozotocin-induced diabetes. Diabetes was induced by a single intraperitoneal injection of streptozotocin (50 mg/kg body weight, St. Louis, USA) and was confirmed by determination of urinary glucose secretion. Diabetic rats in the three L-carnitine treated groups were given L-carnitine, 50 (D50), 100 (D100) and 200 (D200) mg/kg body weight, by subcutaneously every other day for four weeks, while animals in normal (N) and diabetic (DM) groups for control received saline by the same method. At final day of experimental periods, animals were sacrificed following a three hours administration of carnitine. The levels of total lipid, triglyceride and cholesterol in liver and serum were measured by enzymatic method. The levels of carnitine were measured by radio-enzymatic assay.

The daily weight gain was not different between normal and diabetic rats, but daily dietary intake was significantly higher ( $p < 0.05$ ) in diabetic rats than in normal rat, therefore these results induced food efficiency ratio was significantly higher ( $p < 0.05$ ) in normal rats than diabetic rats. Diabetic rats had a significantly lower carnitine concentration in both serum ( $p < 0.05$ ) and liver ( $p < 0.01$ ) compared with normal rats. Total carnitine concentration in serum were increased dose dependently by carnitine administration, but statistic significance was shown only in D200 group ( $p < 0.05$ ). Diabetic rats had significantly higher serum triglyceride ( $p < 0.05$ ) and cholesterol ( $p < 0.01$ ) concentrations compared with normal rats. However there were no significant differences in liver. L-carnitine administration to diabetic rats significantly decreases serum triglyceride but not cholesterol concentrations. In liver, triglyceride and cholesterol concentrations were not changed by L-carnitine administration.

These results indicated that streptozotocin induced-diabetic rats have decreased carnitine and increased lipid concentrations compared with normal rats. Also it indicated that L-carnitine administration to diabetic rats decreased serum triglyceride concentrations.