



L-Carnitine supplementation in uremic patients

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Dear Editor,

We read with interest the paper of Debska-Slizien A *et al.* (1), recently published in *Nephro-Urology Monthly* which focused on the impact of L-Carnitine on management of anemia among dialysis patients. We know that plasma free carnitine concentration in hemodialysis patients is reduced (19.2-32.4 $\mu\text{mol/L}$) and significantly lower than in healthy controls (40-50 $\mu\text{mol/L}$) or in chronic kidney disease patients. Several factors contribute to this abnormal profile (2) containing of reduction in endogenous carnitine synthesis and limitation in dietary intake and hemodialysis removal. We agree with Debska-Slizien A *et al.* that L-Carnitine may increase blood hemoglobin levels in hemodialysis patients without erythropoietin therapy, and may decrease erythropoietin dose in hemodialysis patients who receives combined therapy with L-carnitine and erythropoietin (3). Furthermore, L-Carnitine supplementation may improve several situations, such as cardiac performance, intradialytic hypotension, muscle symptoms, and impaired exercise and functional capacities in hemodialysis patients. On the other hand, it could have a positive impact on nutritional status of uremic patients by positive protein balance induction,

insulin resistance reduction, and chronic inflammation amelioration (4). So it seems that L-Carnitine administration might be rational in hemodialysis patients. However, there is still a big controversy surrounding L-Carnitine supplementation in dialysis patients (5), and limited data is also available on possible benefits of L-Carnitine supplementation in uremic patients (3).

So it is difficult to vouch for benefits of L-Carnitine supplementation in CKD patients because the sign and symptoms of L-Carnitine insufficiency overlap with those of dialysis generally. Laboratory evidence of abnormal L-Carnitine metabolism is abundant in dialysis patients and we cannot estimate plasma L-Carnitine level after L-Carnitine supplementation. The NKF-K/DOQI working groups published guidelines for management of ESRD complications, do NOT routinely recommend L-Carnitine supplementation in these patients (6) unless in the case of hypotension and muscle cramps during dialysis, muscle weakness, decreased exercise capacity, cardiomyopathy, and low cardiac output which were unresponsive to standard treatment (6). Finally, in symptomatic patients if L-Carnitine replacement is needed, it must be administered at a dose of 20 mg/kg intravenously after dialysis. Because of limited bioavailability of oral L-Carnitine supplements and high required doses of drug, it is not recommended to use oral supplements (7). In addition, data on the efficacy of oral L-Carnitine are limited

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and toxic metabolites of oral L-Carnitine are generated by intestinal metabolism (8, 9) may cause cognitive impairment (10).

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