THE EFFECT OF L-CARNITINE ADMINISTRATION ON MORTALITY OF HEMODIALYSIS PATIENTS DIAGNOSED WITH CARNITINE DEFICIENCY

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Introduction and aims

Levocarnitine (LC) deficiency in hemodialysis patients is common. It is well known that the administration of LC can improve the ESA resistant anemia and cardiac systolic function of HD patients diagnosed with carnitine deficiency. It is well known that the prognosis of congenital LC deficiency subjects is very poor. But there is no clinical report about the effect of LC administration on mortality of hemodialysis patients. This study was designed to confirm whether LC can improve the mortality of HD patients diagnosed with LC deficiency or not.

Method

Study Design: Retrospective observational study.
Patients: 166 patients undergoing hemodialysis were diagnosed with carnitine deficiency (plasma concentration of free carnitine < 32μmol/L) at December 2012.
A daily dose of levocarnitine chloride (300~1800mg/day) was administered orally to 116 patients who agreed with taking levocarnitine from December 2012 for over three years. 50 patients rejected to take LC.
The mortality of 166 patients for three years were compared among the patients in two groups (treated with LC or not).

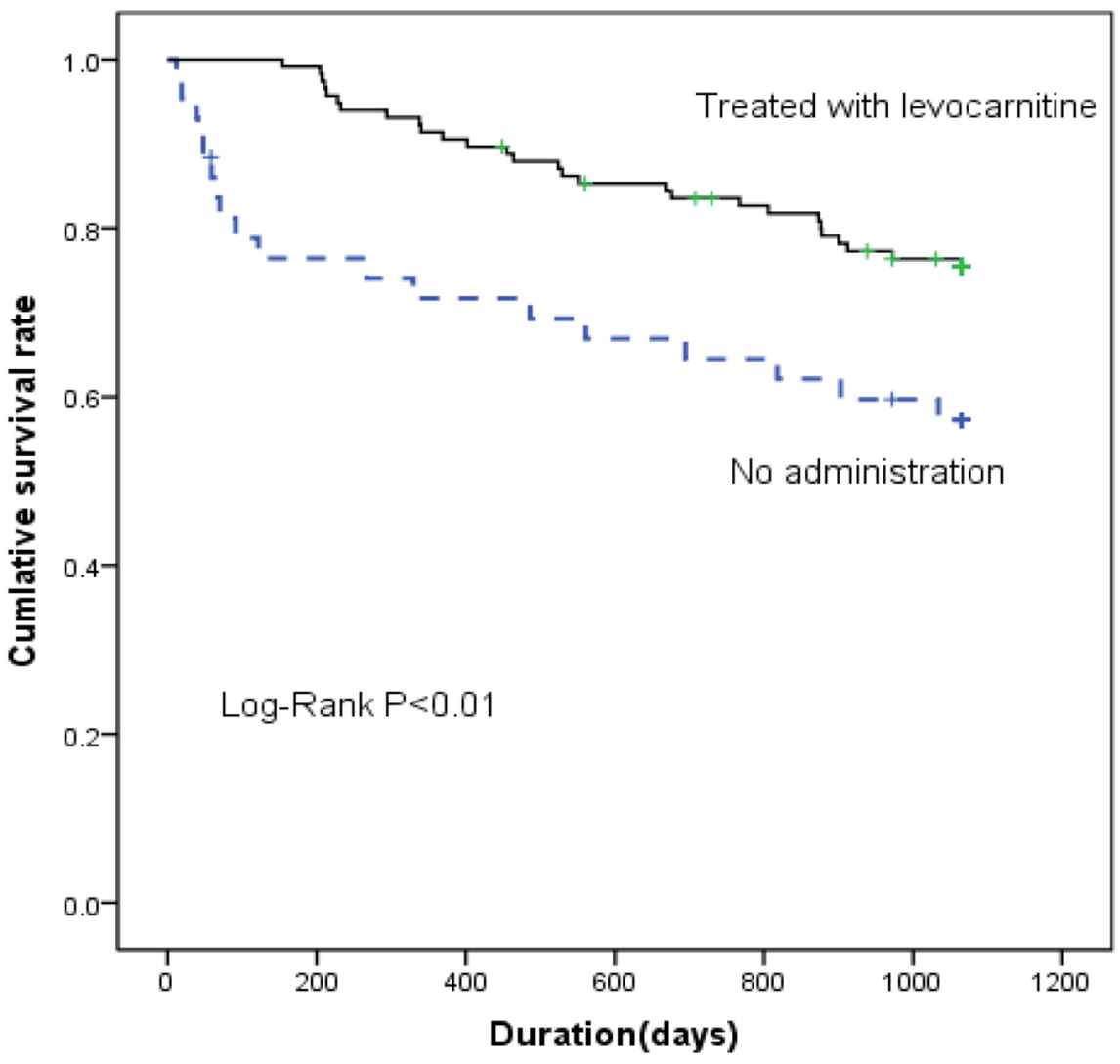
Results

There were no significant difference between two groups in the demographic characteristics before treatment.(Table) The plasma concentration of FC increased significantly after the administration of LC(20.8±4.6μmol/L to , 238.2±151.9μmol/L),but no treated group showed no significant increase.
Kaplan-Meier analysis revealed the mortality was significantly lower in the LC treated group than no treated group (Log-Rank test p<0.01).(Figure)

Demographic characteristics before treatment

	Treated group	no treated group	P (Man-Whitney)
N	116	50	NS
Age	69.6±12.8	70.3±12.9	NS
male	63	28	NS
HD duration(years)	9.1±5.9	8.9±6.6	NS
Albumin(g/dl)	3.5±0.4	3.7±0.4	NS
hs-CRP	2598±5887	4324±7385	NS
free-carnitine(μmol/L)	20.9±4.6	22.2±6.8	NS
Hemoglobin	10.8±1.1	11.0±0.9	NS

Kaplan-Meier analysis



Conclusion

This study suggested that administration of levocarnitine could improve the mortality of hemodialysisi patients diagnosed with carnitine deficiency.
The primary roles of carnitine are to transport long-chain fatty acid into the mitochondria for β-oxidation and incompletely metabolized acyl CoA out.
Carnitine deficiency can result in several derangements of cellular function.
These abnormalities may occur the clinical problems, including EPO-resistant anemia, muscle weakness hypotension, myopathy, and cardiac arrhythmia.
So, administration of levocarnitine to increase the plasma level of free-carnitine to normal range can contribute to improve the mortality of hemodialysis patients diagnosed with carnitine deficiency.

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