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Clinical Impact of Calcitriol in the Patients Requiring Post Operative Continuous Renal Replacement Therapy After Successful Liver Transplantation

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Objectives: The mortality of the patients with End-Stage Liver Disease and renal dysfunction is high. It is important to know and correct the predicting risk factors of mortality in the patients requiring continuous renal replacement therapy (CRRT) after successful liver transplantation (LT). Immunomodulatory effects of calcitriol, produced by liver and kidney, improved survival rate in the animal experiment underwent solid organ transplantation. Therefore, we investigated whether lower calcitriol level is associated with the mortality in the patients requiring CRRT after successful LT.

Methods: We conducted a retrospective study consisted of 65 patients requiring CRRT after successful LT. Their demographic data and biochemistry parameters were obtained at the initiation of CRRT by reviewing electronic medical records. The deficiency of calcitriol was defined as its plasma level < 10 pg/ml. Primary end point was 180-day mortality from the initiation of CRRT after LT.

Results: The subjects were divided into calcitriol deficient group (CDG, n=36) and calcitriol non-deficient group (CNDG, n=29). There were no significant differences in demographics between two groups. Compared with CDG, hematocrit (26.3 +/- 2.3 vs. 20.5 +/- 5.1 (%), p=0.045) and 25(OH)D3 (7.2 +/- 2.8 vs. 2.8 +/- 1.2 (ng/ml), p=0.011) were higher in CNDG at the initiation of CRRT. In contrast, 180-day mortality in CDG (30.6%, 11/36) was higher than that of CNDG (3.4%, 1/29, p=0.005). By Univariate analysis, calcitriol deficiency, hypertension, septic shock and age were risk factors for survival. By Cox regression analysis, calcitriol deficiency (OR 81.1, 95% CI 2.6-2574.0, p=0.012) was only risk factor of mortality after adjusting Model For End-Stage Liver Disease, RIFLE and 25(OH)D3 and other parameters.

Conclusions: Calcitriol deficiency is associated independent risk factor with the mortality in the patients requiring CRRT after LT. In the future, randomized interventional trial is necessary whether calcitriol is a correctable risk factor to improve the survival in them.

Table 1.

Table 1. Predictors of mortality at 180 days from initiation of CRRT in liver transplant recipients

Factor	Univariate		Multivariate		
	OR	95% CI	OR	95% CI	P
Calcitriol deficiency (Yes)	10.0	1.3 – 77.7	81.1	2.6 – 2574.0	.012
Hypertension (Yes)	5.1	1.6 – 16.3	4.4	0.7 – 28.9	.120
Septic shock (Yes)	0.2	0.1 – 0.6	0.2	0.1 – 1.8	.147
Age	1.1	1.0 – 1.2	1.0	1.0 – 1.1	.334

OR from Cox regression analysis. Variables with $P < 0.05$ on univariate analysis are shown in table and included in the multivariate model (see Methods section for all tested variables). (n =65)

OR, odd ratio; CI, confidence interval

Figure 1.

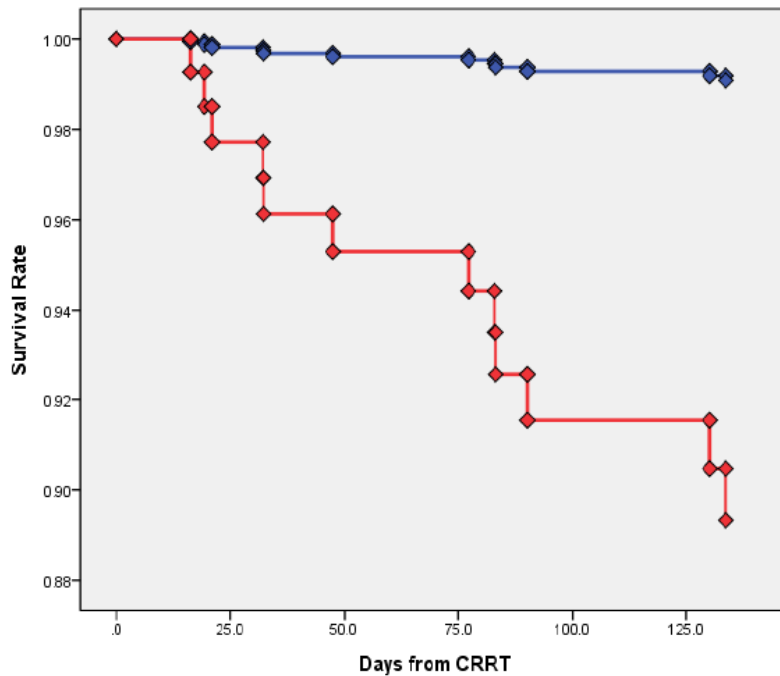


Figure 1. Survival estimates the mortality in liver transplant recipients according to presence of calcitriol deficiency by Cox regression analysis (p=.012)