

15TH WORLD NEPHROLOGY CONFERENCE

May 20-21, 2019 Tokyo, Japan



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Role of nutritional vitamin-D in secondary hyperparathyroidism

In Chronic Kidney Disease (CKD), hyperphosphatemia induces Fibroblast Growth Factor-23 (FGF-23) expression that disturbs renal 1, 25-dihydroxy vitamin D (1, 25D) synthesis; thereby increasing Parathyroid Hormone (PTH) production. FGF-23 acts on the Parathyroid Gland (PTG) to increase 1 α -hydroxylase activity and results in increase intra-gland 1, 25D production that attenuates PTH secretion efficiently if sufficient 25D are available. Interesting, calcimimetics can further increase PTG 1 α -hydroxylase activity that emphasizes the demand for Nutritional Vitamin D (NVD) under high PTH status. For the high prevalence of Vitamin-D Deficiency (VDD) in hemodialysis patients, an increase in 1 α -hydroxylase to 10-fold and decrease in 24-hydroxylase to 1/10-fold highlight the requirement of more 25D in the PTG of SHPT. The expression of CaSR and VDR were also decreased in the PTG cells, which is thought to be related to calcimimetics or calcitriol resistance. A higher proportion of oxyphil cells as hyperplastic parathyroid progression, lower cytosolic DBP content in oxyphil cells and calcitriol promote vitamin D degradation by enhancing 24-hydroxylase activity all aggravate vitamin D hunger in PTG. Hence, NVD supplementation in SHPT is relative important. Clinically, NVD supplements can effectively restore serum 25D concentration, alleviate the development of SHPT in early CKD and have benefits in further lowering PTH in moderate to severe SHPT in dialysis patients. However, these benefit of NVD supplement in SHPT need more randomized control trials to prove.

Biography

Kuo-Cheng Lu has joined the National Defense Medical Center faculty in 1985 after having training at Internal Medicine and Clinical Nephrology. He devoted the first two decades of his career to the clinical care of dialysis patients at Tri-Service General Hospital and private Kou-Cheng Clinic in Taipei, Taiwan. After managing of private dialysis clinic for ten years, he moved to the Nephrology Division of Cardinal-Tien Hospital, an affiliated teaching hospital of Fu-Jen Catholic University. In 2003, he was elected as the Chairman of Department of Medicine, Cardinal-Tien Hospital. In 2015, he was recruited to join Fu-Jen Catholic University as an Associate Dean of College of Medicine, Fu-Jen Catholic University. He also has published papers in the field of music therapy in dialysis patients. Currently, he spends much time on the strengthening international collaboration among the Taiwan Society of Nephrology (TSN) and Nephrology Society of Japan, Korea, Thailand and Malaysia to enhance the academic communicate, share the clinical experience and promote CKD education programs.

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