Clinical Evaluation of Bone Metabolism after Renal Transplantation to Support the Theory to Perform 1,25(OH)2D3 Pulse Therapy before Transplantation

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Dear Sir,

The loss of bone mineral density after renal transplantation has been reported [1-3]. One of the risk factors seems to be hyper-parathyroidism which persists even after successful renal transplantation. New trials to prevent bone loss are urgently needed to develop rational and effective therapeutic strategies in kidney transplant patients [2, 3]. This study was done to confirm theoretical evidence to perform 1,25(OH)2D3 pulse therapy before renal transplantation as a new therapeutic strategy.

Twenty-one patients who had a serum creatinine level of less than 2.0 mg/dl were selected. All patients had a more than 1-year history after operation. Mean age: 28.5 ± 11.9 (mean ± SD) years old. Mean dialysis history before transplantation: 55.0 ± 59.4 months. Mean duration after operation: 71.9 ± 60.2 months. To these patients, serum Ca, P, ALP, 1,25(OH)2D3, HS-PTH, %TRP, Singh score, osteoporosis score of vertebral bone and bone mineral content by digital image processing (DIP) method (ΣGS/D by DIP method) were measured and analyzed. Correlation between Singh score and duration after operation was r = -0.943 and the osteoporosis score of vertebral bone showed the same strong negative result. Concerning % ΣGS/D to normal control, 75% of transplanted patients showed less than 80%. Only 14% of all 21 patients had less than -1 SD level of serum 1,25(OH)2D3 of normal control. Only 16% showed normal HS-PTH and the other 84% had a higher level than the normal range. %TRP was less than the normal limit in 71% of all 21 patients. Serum P was normal in 95%.

Phosphate (900-2,000 mg/day) was administered to 3 male patients with living related renal transplantation during 1-4 months from just after operation and %TRP, serum HS-PTH and P were measured. Mean %TRP was 20%. HS-PTH had a higher level and serum P a lower level than the normal range.
Bone loss after renal transplantation and abnormal %TRP despite a serum level of 1,25(OH)2D3 normalizing in most cases, which was shown in this study, seems to be affected not only by steroids but also secondary hyperparathyroidism which continued after operation. Several reports show that rapid bone loss was observed early after operation (within 12 months) [1-3]. In this period, secondary hyperparathyroidism does not seem to recover completely by the physiological serum level of 1,25(OH)2D3 from transplanted kidney, because rapid decrease of serum PTH level was achieved by the pharmacological serum level of 1,25(OH)2D3, not by the physiological level [4, 5]. We showed rapid reduction of parathyroid glands and serum PTH within 1-3 months by oral 1,25(OH)2D3 pulse therapy in hemodialysis patients by showing ultrasound sonography in 1991 [6]. It is thought that there is a possibility that bone loss after transplantation would be avoided to some extent by reduction of parathyroid glands and changing Ca-PTH set-point by 1,25(OH)2D3 pulse therapy. 1,25(OH)2D3 pulse therapy during several months before operation is a choice of strategies to prevent rapid bone loss after renal transplantation.

References