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Bone and Mineral Disorders After Kidney Transplantation

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Disturbances in bone and mineral metabolism are common in patients undergoing hemodialysis and often continue after successful kidney transplantation.[1,2] Vitamin D deficiency following kidney transplantation is a common problem and is usually due to a high prevalence of vitamin D deficiency at the time of transplantation, avoiding direct sun exposure because of the high risk of skin cancer due to immunosuppressive therapy, inadequate dietary calcium and vitamin D intakes, insufficient graft functioning, and side effects of drugs using after kidney transplantation.[3-5] In the current issue of the *Iranian Journal of Kidney Diseases*, Savaj and Ghods[6] revealed that vitamin D deficiency was a common complication among kidney transplant patients (45%), which matches with the results reported by Stavroulopoulos and coworkers who found a 46% prevalence of hypovitaminosis D in long-term among kidney transplant recipients.[7] In one study, low 1,25-dihydroxyvitamin D3 levels persisted up to 18 months after kidney transplantation.[1] In a series of 61 kidney recipients, low levels of 1,25-dihydroxyvitamin D3 were reported in 48% of patients 6 months following kidney transplantation.[8] Querings and colleagues showed a significantly lower serum 25-hydroxyvitamin D3 levels in kidney transplant recipients when compared to a control group.[9] In addition, vitamin D deficiency was more likely to occur in recipients with higher

serum parathyroid hormone (PTH) levels and those who had kidney allograft impairment.[6] Vitamin D deficiency is also prevalent problem in Danish kidney transplant recipients and is associated with decreased serum 1,25-dihydroxyvitamin D concentrations and increased levels of PTH.[10] Vitamin D deficiency can lead to enhanced T cell reactivity and subsequent higher risk of graft rejection.

Although concentrations of PTH usually tend to decline after kidney transplantation,[8,11] PTH levels remain elevated in half of the patients 2 years after the transplant surgery,[12,13] and this trend is persistent for more than 5 years after kidney transplantation.[13,14] Savaj and Ghods showed a very high prevalence of hyperparathyroidism (76%) after kidney transplantation.[6] In addition, PTH values are notably higher in the transplant patients with worse kidney function,[13] similarly to Savaj and Ghods' study results; they found a significant correlation between hyperparathyroidism and serum creatinine (P = .02).[6]

Most studies have shown that bone density reduces in patients after kidney transplantation and low bone mineral density (BMD; T score < -2.5) is commonly distinguished in kidney transplant recipients.[1,12,14-16] Savaj and Ghods showed that the percentage of recipients diagnosed with low BMD at the lumbar spine was 52% and in the femoral neck, a cortical site, 36% of cases were diagnosed with this problem.[6] However, Nouri-Majalan and coworkers reported a higher rate of low BMD in the lumbar vertebrae than in the femoral neck (21% versus 10%).[15] Low BMD would occur at the lumbar vertebra of 17% to 49% of kidney transplant patients, at the neck of femur of 11% to 56%.[16] Bone mineral density generally decreases in both the femoral neck and lumbar spine within the first 3 months after kidney transplantation. By month 6, BMD is relatively stable and by month 9, the increase is modest according to most of the studies.[17,18] Most studies showed that high levels of posttransplant PTH is associated with greater BMD loss than those who have lower PTH level after kidney transplant,[12,19-21] although some studies reported no difference.[11,21-23] While Savaj and Ghods found that high serum levels of PTH had a significant correlation with low BMD in univariable analysis, this correlation was not documented when PTH levels was adjusted for other factors.[6]

It is of interest that Savaj and Ghods reported lower BMD at the cortical bone compared with trabecular skeletal sites (45.5% femoral neck versus 12.5 % lumbar spine),[6] which matches with that of other studies.[24,25] On the other hand, vertebral fractures are more likely to be occurred than cortical bone sites.[24-26] The incidence of bone fracture was approximately 5% to 44%, which is 4-fold greater than that before kidney transplant.[16] Most of kidney transplant recipients receive corticosteroids, which may cause more bone loss at trabecular sites.[24,25] In addition, cyclosporine induces bone loss through increases bone resorption.[16] In our previous study, the cumulative prednisone dose and the cumulative cyclosporine dose were significantly correlated with spinal and femoral bone loss.[22]

Savaj and Ghods did not find a gender effect on bone loss in multivariable analysis,[6] although there is an increased risk of low BMD among females, particularly postmenopausal state possibly relating to a greater loss of bone in the presence of estrogen deficiency.[24,27] In our previous study, female gender was a risk factor for low BMD.[22]

Finally, bone and mineral disturbances are very common problems following kidney transplantation; hence, early screening and management of this high risk group is essential.

CONFLICT OF INTEREST

None declared.

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Is Management of Angiomyolipoma Different After Kidney Transplantation?

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Angiomyolipoma (AML) is a common benign lesion of various organs,[1] which was first described by Morgan and colleagues.[2] Despite its benign behavior and no reportedly metastasis, it can