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Beyond the bones: The association between Vitamin D, graft outcomes, malignancy and vascular disease

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Introduction:

Vitamin D deficiency in kidney transplant recipients (KTRs) is an emerging theme. The purported associations between Vitamin D deficiency and various metabolic, cardiovascular and non-metabolic adverse events have not been thoroughly studied in KTRs.

Methods:

In this prospective observational study, we examined the association between Vitamin D deficiency, graft loss, mortality, NODAT, cardiovascular events and development of cancers.

Results:

504 KTRs had their vitamin D checked in 2008 and were followed up for 100 months. Vitamin D status was defined as normal (**N, >50nmol/L**), insufficiency (**Ins, 25-50 nmol/L**) or deficiency (**Def, <25 nmol/L**) as per WHO criteria. The prevalence of vitamin D deficiency was high (**Ins 37%, Def 28%**) with a significantly higher prevalence in older and female recipients, and in relatively new transplants. KTRs who were vitamin D deficient had significantly worse mortality (**N, 4% vs. Ins, 9% vs. Def 14% p<0.001**), death censored graft loss (**N, 4% vs. Ins, 7% vs. Def 13%, P<0.001**), development of NODAT (**N, 8% vs. Ins, 15% vs. Def, 15% p=0.01**) and cardiovascular events (**N, 2% vs. Ins, 5% vs. Def, 9%, p=0.01**) when compared to those with normal levels (N). Although vitamin D deficiency is not associated with a higher incidence of malignancy, it is associated with higher mortality in those with cancer (**Def, 79% vs. N and Ins, 37%, p=0.01**). In a multivariate Cox model, vitamin D deficiency was associated with significantly worse mortality (**Ins, HR 2.3, p=0.004; Def, HR 3.3, p<0.001**) and death censored graft loss (**Ins, HR 2.0, p=0.03; Def. HR 3.1, p<0.001**), NODAT (**Ins, HR 2.0, p=0.02; Def, HR, 2.2. p=0.005**) and cardiovascular events (**Ins, HR 2.4 p=0.05; Def 3.3, p=0.008**) independent of age, PTH levels, gender, graft number, type of transplant, time since transplantation, graft type and renal function, proteinuria, steroid usage and Calcium phosphate product.

Discussion:

Vitamin D deficiency, which is highly prevalent in KTRs is associated with adverse clinical outcomes. Our study stresses the need for a prospective trial of vitamin D replacement in KTRs