EFFECT OF VITAMIN D_3 SUPPLEMENTATION ON BONE MINERAL DENSITY IN CHRONIC KIDNEY DISEASE

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To examine whether vitamin D_3 supplementation is associated with an improvement in bone mineral density (BMD) in subjects with moderate CKD.

We performed a post-hoc analysis of the Decalyos II (Vitamin D_3, Calcium Lyon Study II), a 2-year randomized, double-blind, placebo controlled study of 610 women randomized to: calcium-vitamin D_3 fixed combination (Ca-D_3), calcium plus vitamin D_3 separate combination (Ca+D_3), and placebo. Treatment groups received equal amounts of daily elemental calcium (1200mg) and vitamin D_3 (800 IU). Estimated glomerular filtration rate (eGFR) in ml/min/1.73 m^2 was calculated using the Modification of Diet in Renal Disease (MDRD) equation. BMD of the distal radius was measured by single X-ray absorptiometry (SXA) at baseline, 12 and 24 months. Changes from baseline in BMD were analyzed by analysis of covariance (ANCOVA).

At baseline 47.2%, 36.4% and 16.4% of the study population had an eGFR $\geq$60, 59-45, and <45 mL/min/1.73m^2, respectively. Active regimens vs placebo increased the mean 25(OH)D levels from baseline in all eGFR groups, at all time points ($p<0.0001$ for all). Analysis of variance demonstrated an overall treatment effect on BMD ($p=0.005$), with the active arms showing higher BMD levels and a lower average bone loss when compared to placebo at 24 months. Treatment effect varied by kidney function group and was strongest in the group with eGFR less than 45 mL/min/1.73m^2 ($p=0.02$). At 24 months, serum calcium did not differ clinically by eGFR or treatment group.

Vitamin D3 supplementation (800 IU) was effective in improving BMD in patients with moderate CKD.