

25- Hydroxyvitamin D is Inversely Associated with Serum MMP-9 Concentration in ESRD Patients

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Background

- Chronic inflammation increases the risk of cardiovascular disease and death in ESRD patients
- Studies suggest an inverse association between circulating 25(OH)D and inflammatory markers in general population
- ESRD patients have high prevalence of vitamin D deficiency
 - Vitamin D deficiency increases risk of and cardiovascular disease
 - Mechanisms are not known
- We tested whether circulating 25(OH)D concentration is associated with serum inflammatory biomarkers in cross-sectional pilot study of prevalent ESRD patients

Methods

- Prevalent African-American ESRD patients in 6 Emory University-affiliated Davita dialysis units, 9/01/06 to 11/30/08
- Cross-sectional study
- Exclusion criteria
 - Known malignancy, active vasculitis
 - Evidence current infection, inflammation
 - Current steroid, calcineurin inhibitor, antimetabolite use
- Blood sample for vitamin D, inflammatory biomarkers
- Logistic regression models to examine associations between 25(OH)D concentrations and inflammation

Results

Table 1. Characteristics of study participants by circulating 25(OH)D concentration

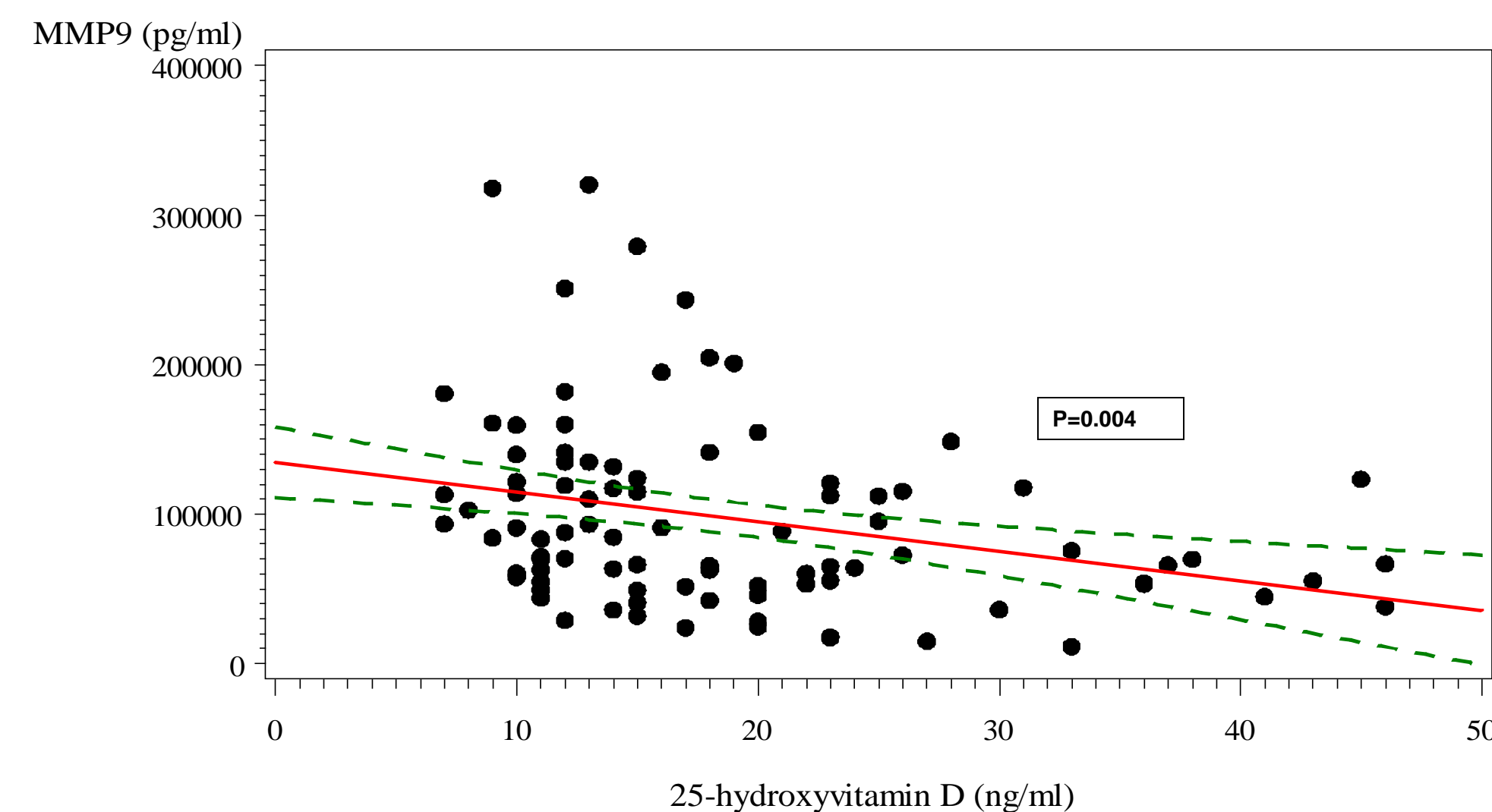
Characteristic	All patients N=91	Vit D < 15 ng/ml N=39	Vit D ≥ 15 ng/ml N=52	p value
Age (years)	59.25 ± 12.42	56.38 ± 12.59	61.41 ± 11.96	0.055
Sex				0.275
Female	43 (47.25)	21 (48.54)	22 (51.16)	
Male	48 (52.75)	18 (37.50)	30 (62.50)	
Vitamin D level (ng/ml)	18.78 ± 9.60	11.10 ± 1.95	24.53 ± 8.99	<0.0001

Table 2 : Adjusted * associations between 25(OH)D and Inflammatory Markers

Biomarker	Beta coefficient (SE)	P value
Log MMP9 (pg/ml)	-0.017 (0.008)	0.04
Log CRP (mg/ml)	-0.013 (0.015)	0.39
Log IL-10 (pg/ml)	0.022 (0.0103)	0.04

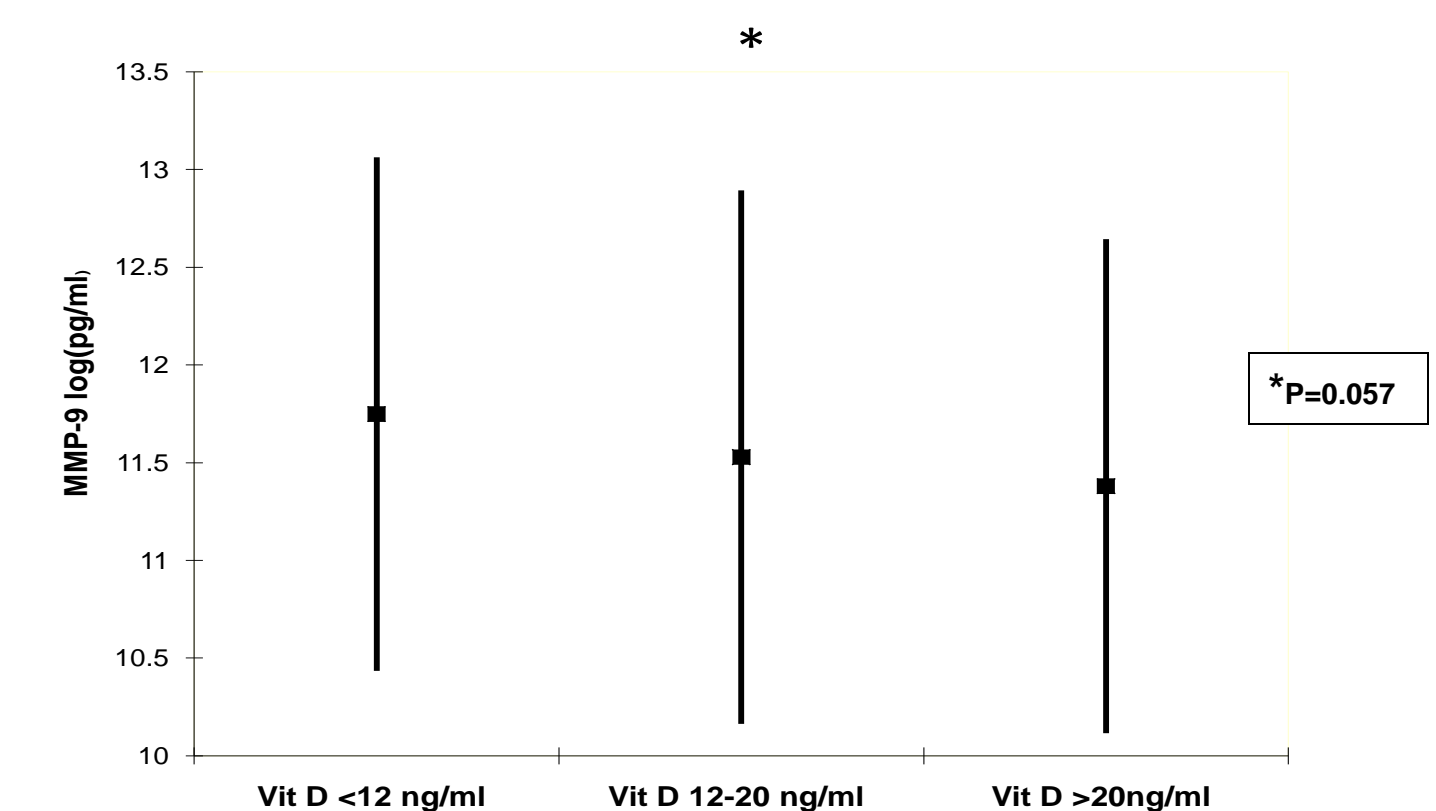
*Adjusted for smoking, gender, BMI, age, diabetes

Figure 1: Correlation between Serum 25 (OH) D and MMP-9 Concentration



Pearson correlation coefficient -0.29578
Continuous line= Regression Line; Dashed lines= 95% confidence intervals

Figure 2: Difference in Log Concentration of MMP-9 by 25(OH) D Tertile



Conclusions

- 25 (OH) D concentration is inversely and significantly correlated with MMP-9 concentration (P value=0.004)
- MMP-9 expression is independently associated with 25(OH)D concentration in ESRD patients (P value=0.04)
- Results may help elucidate the mechanism by which 25(OH)D functions as a cardiovascular risk factor
- Future studies are needed to characterize the relationship between vitamin D therapy and inflammation

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