The Association of Frailty with Serum 25-Hydroxy Vitamin D in Older Men

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Aims

To assess the association:

1) between 25-hydroxy vitamin D [25(OH)D] and **prevalent** frailty status.
2) between 25(OH)D and **incident** frailty status.

Methods

- This study is part of an observational longitudinal population-based study in 352 **ambulatory older men**, that started in 1996 with yearly assessments till 2000 and follow-up by phone still on going.
- Frailty status was assessed in 1997 and 2000 using the **Study of Osteoporotic Fractures [SOF] index** with the components of weight loss, inability to rise from a chair 5 times without using arms, and reduced energy level.
- Blood samples were collected between July and October in 1997. **Serum 25(OH)D** was determined after extraction by radioimmunoassay.
- Patients taking vitamin D supplements in 1997 and/or 2000 were excluded.

Results

Table 1. Characteristics of the study population in 1997 and 2000.

	246 subjects in 1997	167 subjects in 1997 and 2000	
	1997	1997	2000
Age, years	76.1 ± 3.9	75.3 ± 3.4	78.3 ± 3.4
BMI, kg/m²	26.5 ± 3.4	26.8 ± 3.4	26.7 ± 3.5
25(OH)D, ng/ml	26.1 ± 7.8	27.2 ± 7.6	
Vitamin D status			
Deficient (< 20 ng/ml)	47 (19%)	24 (14%)	
Insufficient (20-30 ng/ml)	120 (49%)	78 (47%)	
Sufficient (≥ 30 ng/ml)	79 (32%)	65 (39%)	
SOF frailty items			
Weight loss	16 (7%)	11 (7%)	18 (11%)
Inability chair rising	18 (7%)	7 (4%)	11 (7%)
Reduced energy level	49 (20%)	21 (13%)	33 (20%)
SOF frailty status			
Robust	175 (71%)	132 (79%)	114 (68%)
Prefrail	61 (25%)	31 (19%)	45 (27%)
Frail	10 (4%)	4 (2%)	8 (5%)

Continuous variables are presented as mean ± standard deviation and countable variables as absolute number (percentage of the total).

Figure 1. Vitamin D status according to frailty status in 1997 and 2000.

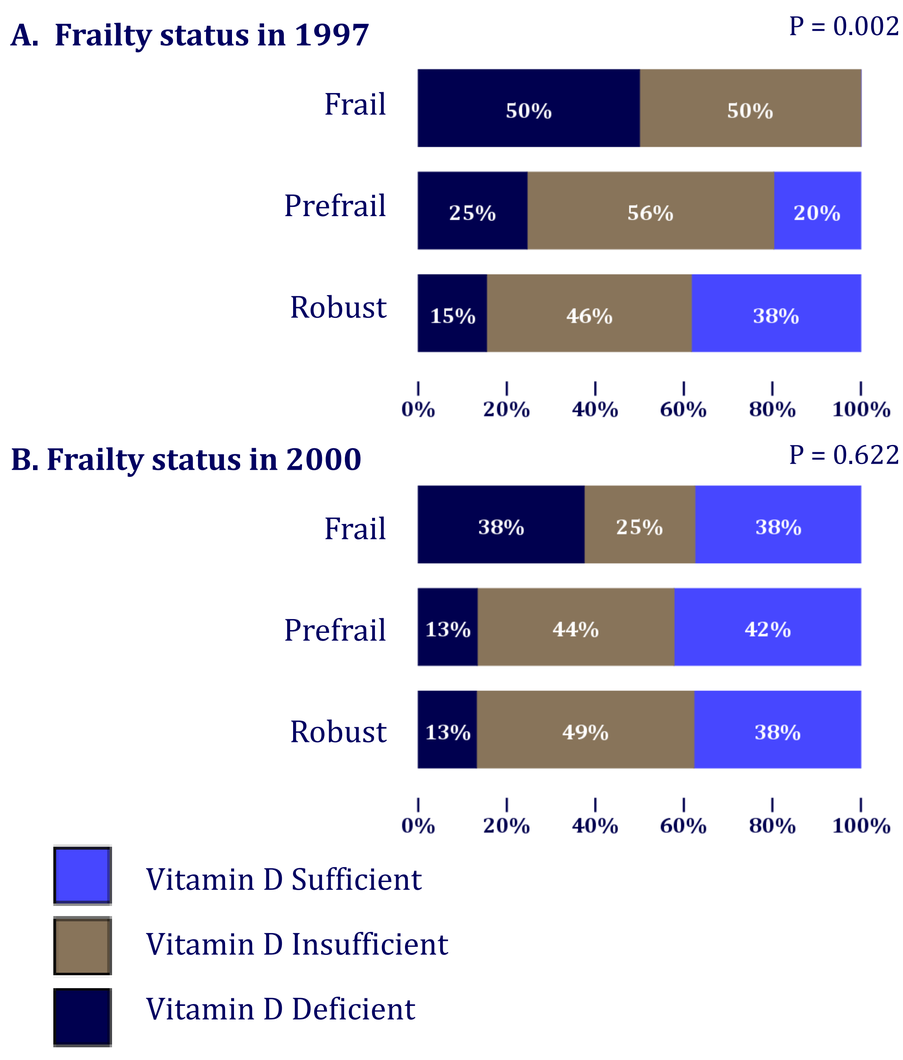

Table 2. Logistic regression to assess the predictive value of 25(OH)D for prevalent and incident (pre)frailty.

	(pre)frailty 1997				(pre)frailty 2000			
	Unadjusted model		Model a		Unadjusted model		Model b	
	OR (95% CI)	P	OR (95% CI)	P	OR (95% CI)	P	OR (95% CI)	P
25(OH)D, per 10 ng/ml increase	0.54 (0.37 - 0.78)	**0.001**	0.59 (0.40 - 0.87)	**0.008**	0.89 (0.58 - 1.38)	0.610	1.02 (0.64 - 1.63)	0.943
Vitamin D Deficient vs Sufficient	4.07 (1.75 - 9.48)	**0.001**	3.36 (1.40 - 8.03)	**0.007**	1.15 (0.43 - 3.03)	0.785	0.89 (0.31 - 2.57)	0.834
Vitaming D Insufficient vs Sufficient	2.58 (1.25 - 5.33)	**0.010**	2.46 (1.17 - 5.18)	**0.018**	0.75 (0.37 - 1.53)	0.429	0.58 (0.27 - 1.24)	0.16

Model a included age and BMI in 1997 as covariates.
Model b included age, BMI and frailty status in 1997 as covariates.

Conclusions

Serum 25(OH)D is associated with prevalent (pre)frailty in older men, but not with incident (pre)frailty.