STRATIFYING CARDIOVASCULAR RISK BY VITAMIN D LEVELS: WHAT ARE THE OPTIMAL CUTOFFS?

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Background: Vitamin (Vit) D is increasingly being implicated in a wide range of cardiovascular and other health problems, including hypertension, diabetes, depression, and renal disease. However, the best cutoffs to optimize risk assessment have not been determined.

Methods: Among those >50 yrs (N=31,289), 3 different Vit D categorizations were evaluated to determine risk among various outcomes. The categorizations, based on Vit D levels (ng/mL) were: category (cat) 1: <15 (5050), 16-20 (4573), 21-40 (17,112), >40 (4554); cat 2: <10 (1347), 10-19 (7276), 20-43 (19,279), >43 (3387); and cat 3: <15 (5050), 16-30 (14,678), 31-50 (9950), >50 (n=1611). Cat 1 and 2 were determined by recursive partitioning and cat 3 represented the reported range of normal. Adjusted Cox hazard regression analysis was used to determine associations between Vit D and outcomes (death, hypertension, diabetes, coronary artery disease [CAD], myocardial infarction [MI], heart failure [HF], stroke, depression, and renal failure [RF]).

Results: Age averaged 67±11 yrs, 74% female. Cat 2 was a better predictor of 7 of the 10 outcomes evaluated (Table): death, diabetes, CAD, MI, HF, depression, and RF. When restricting evaluation to those without the outcome prior to obtaining the vit D level, cat 2 remained the better predictor (Table).

Conclusion: Vit D is associated with an enhanced risk with increasing levels. This risk seems to be best defined using the categories defined here. In general, it appears that a Vit D level >43 ng/ml is optimal.

Outcomes	<10 vs. >43	10-19 vs. >43	20-43 vs. >43
Death	HR=1.80, p<0.0001	HR=1.24, p=0.03	HR=0.80, p=0.02
Diabetes	HR=1.54, p<0.0001	HR=1.39, p<0.0001	HR=1.16, p=0.01
CAD	HR=1.40, p=0.001	HR=1.26, p=0.001	HR=1.04, p=0.55
MI	HR=2.70, p=0.002	HR=1.68, p=0.04	HR=0.95, p=0.83
HF	HR=1.52, p<0.0001	HR=1.17, p=0.07	HR=0.96, p=0.65
Depression	HR=1.26, p=0.05	HR=1.32, p=0.001	HR=1.10, p=0.24
Renal Failure	HR=1.72, p<0.0001	HR=1.26, p=0.001	HR=1.07, p=0.27
No Prior Condition			
Hypertension (n=13,507)	HR=2.15, p<0.0001	HR=1.47, p<0.0001	HR=1.23, p=0.04
Diabetes (n=23,592)	HR=2.45, p<0.0001	HR=1.78, p<0.0001	HR=1.12, p=0.41
MI (n=30,067)	HR=2.55, p=0.007	HR=1.62, p=0.08	HR=0.81, p=0.43
HF(n=27,368)	HR=2.09, p<0.0001	HR=1.58, p=0.002	HR=1.16, p=0.28
Depression (n=25,737)	HR=1.97, p<0.0001	HR=1.51, p=0.001	HR=1.17, p=0.19
Renal Failure (n=26,805)	HR=2.11, p<0.0001	HR=1.19, p=0.15	HR=0.95 p=0.62

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