

Supplemental Material

Table S1. Antihypertensive medication regimens in the total sample; n=517¹

Antihypertensive regimen	n			
	Vitamin D group		Placebo group	
	Baseline	Follow-up	Baseline	Follow-up
0 drugs	160	154	171	167
1 drug	45	48	32	36
ACEI	22	17	15	14
α B	1	4	0	1
ARB	4	5	5	4
β B	5	4	4	6
CCB	7	11	6	8
D	6	7	2	3
2 drugs	31	36	36	32
ACEI + α B	0	0	1	2
ACEI + ARB	0	1	0	0
ACEI + β B	4	5	7	6
ACEI + CCB	2	5	6	5
ACEI + D	10	12	10	9
α B + ARB	0	1	0	0
α B + β B	1	0	0	0
α B + CCB	1	0	0	0
ARB + β B	1	2	2	0
ARB + CCB	0	1	1	1
ARB + D	2	1	0	0
β B + CCB	3	2	2	3
β B + D	3	2	5	4
CCB + D	4	4	2	2
3 drugs	17	14	19	19
ACEI + α B + β B	1	2	1	2
ACEI + α B + CCB	1	1	1	1
ACEI + ARB + D	0	0	1	0
ACEI + β B + CCB	2	1	1	0
ACEI + β B + D	3	2	4	4
ACEI + CCB + D	5	5	5	5
α B + ARB + β B	1	0	0	1
α B + β B + CCB	1	1	0	0
α B + CCB + D	0	0	1	1
ARB + β B + CCB	2	1	0	0
ARB + β B + D	0	0	2	3
ARB + CCB + D	0	0	1	2
β B + CCB + D	1	1	2	0
4 drugs	2	3	3	7
ACEI + α B + β B + CCB	0	1	0	0
ACEI + α B + CCB + D	1	2	1	1
ACEI + β B + CCB + D	1	0	0	2
α B + ARB + β B + D	0	0	0	1
α B + ARB + CCB + D	0	0	1	2
ARB + β B + CCB + D	0	0	1	1
5 drugs	1	1	0	0
ACEI + α B + β B + CCB + D	1	1	0	0
All drugs	96	102	90	94

ACE=ACE inhibitor; α B=Alpha blocker; ARB=Angiotensin receptor blocker; β B=Beta blocker; CCB=Calcium channel blocker; D=Diuretic.

Table S2. Antihypertensive medication regimens in the vitamin D-deficient sample; n=150¹

Antihypertensive regimen	n			
	Vitamin D group		Placebo group	
	Baseline	Follow-up	Baseline	Follow-up
0 drugs	43	40	39	35
1 drug	15	13	11	19
ACEI	7	5	5	8
α B	1	1	0	0
ARB	0	1	1	2
β B	2	1	1	3
CCB	2	3	3	5
D	3	2	1	1
2 drugs	7	12	18	16
ACEI + α B	0	0	0	0
ACEI + ARB	0	0	0	0
ACEI + β B	0	1	2	2
ACEI + CCB	0	3	5	4
ACEI + D	2	3	7	5
α B + ARB	0	0	0	0
α B + β B	0	0	0	0
α B + CCB	1	0	0	0
ARB + β B	0	1	0	0
ARB + CCB	0	1	1	1
ARB + D	1	1	0	0
β B + CCB	1	0	0	1
β B + D	1	1	2	2
CCB + D	1	1	1	1
3 drugs	6	5	8	6
ACEI + α B + β B	0	0	0	1
ACEI + α B + CCB	0	0	1	1
ACEI + ARB + D	0	0	0	0
ACEI + β B + CCB	1	0	0	0
ACEI + β B + D	1	1	3	1
ACEI + CCB + D	2	3	1	1
α B + ARB + β B	1	0	0	0
α B + β B + CCB	1	1	0	0
α B + CCB + D	0	0	0	0
ARB + β B + CCB	0	0	0	0
ARB + β B + D	0	0	0	1
ARB + CCB + D	0	0	1	1
β B + CCB + D	0	0	2	0
4 drugs	0	1	3	3
ACEI + α B + β B + CCB	0	1	0	0
ACEI + α B + CCB + D	0	0	1	1
ACEI + β B + CCB + D	0	0	0	1
α B + ARB + β B + D	0	0	0	0
α B + ARB + CCB + D	0	0	1	1
ARB + β B + CCB + D	0	0	1	0
5 drugs	0	0	0	0
ACEI + α B + β B + CCB + D	0	0	0	0
All drugs	28	31	40	44

ACE=ACE inhibitor; α B=Alpha blocker; ARB=Angiotensin receptor blocker; β B=Beta blocker; CCB=Calcium channel blocker; D=Diuretic.

Table S3. Eigenvalues of the correlation matrix and loadings in the factor analysis (varimax solution) for change (follow-up minus baseline) in arterial waveform parameters among those with baseline vitamin D deficiency (deseasonalised 25(OH) <50 nmol/L)

		Factor*			
		Factor 1	Factor 2	Factor 3	Factor 4
Eigenvalues of the matrix	Eigenvalue	7.422	2.361	1.651	1.093
	Proportion of total variance	0.530	0.169	0.118	0.078
<i>Arterial waveform parameter</i>					
Loading (correlation coefficient)	Pulse rate	0.019	-0.930	-0.093	0.032
	Brachial SBP	0.949	0.118	0.182	0.129
	Brachial DBP	0.830	-0.023	-0.064	0.038
	Aortic SBP	0.930	0.197	0.245	0.121
	Aortic DBP	0.911	-0.196	-0.047	0.049
	Augmentation index	0.058	0.768	0.135	0.187
	Pulse wave velocity	0.926	0.142	0.219	-0.111
	Peak reservoir pressure	0.941	0.265	-0.062	0.123
	Peak excess pressure	0.123	-0.001	0.976	-0.049
	Reservoir pressure integral	0.565	0.770	0.031	0.105
	log _e (excess pressure integral	0.115	0.262	0.919	0.119
	Backward pressure amplitude	0.680	0.412	0.281	0.443
	Forward pressure amplitude	0.812	0.248	0.337	-0.207
	log _e (wave reflection index)	0.043	0.137	0.018	0.971

*Factors > 0.3 are in bold, which indicates that the variable can be considered a significant constituent of that factor.

Table S4. Changes (follow-up minus baseline) in factor analysis variables (adjusted for age, sex and ethnicity) by treatment group among those with baseline vitamin D deficiency (deseasonalised 25(OH) <50 nmol/L)

Factor*	Mean (standard deviation) change from baseline		Change from baseline, vitamin D minus placebo	
	Vitamin D group (n=71)	Placebo group (n=79)	Mean (95% confidence interval)	P-value [†]
Factor 1	-0.30 (1.00)	0.22 (1.00)	-0.52 (-0.94, -0.11)	0.01
Factor 2	-0.35 (1.00)	0.10 (1.00)	-0.45 (-0.87, -0.04)	0.03
Factor 3	0.01 (1.00)	-0.24 (1.00)	0.25 (-0.16, 0.67)	0.23
Factor 4	0.02 (1.00)	0.11 (1.00)	-0.09 (-0.50, 0.33)	0.67

*Described in Table S3.

[†]Analysis of covariance.

Table S5. Arterial function measures at baseline and follow-up (adjusted for age, sex and ethnicity) by treatment group among those without baseline vitamin D deficiency (deseasonalized 25(OH) \geq 50 nmol/L); n=367

Variable	Mean (standard deviation)				Change from baseline, vitamin D minus placebo	
	Vitamin D group (n=185)		Placebo group (n=182)		Mean (95% CI)	P-value
	Baseline	Follow-up	Baseline	Follow-up		
Pulse rate (beats/minute)	63.2 (9.6)	66.0 (9.4)	63.2 (9.5)	66.2 (11.4)	-0.1 (-2.0, 1.8)	0.89
Brachial SBP (mmHg)	138.9 (19.0)	131.0 (16.9)	138.1 (16.0)	131.3 (18.3)	-1.1 (-4.5, 2.4)	0.54
Brachial DBP (mmHg)	78.4 (10.5)	74.1 (10.1)	78.4 (8.9)	74.2 (9.4)	-0.2 (-2.1, 1.7)	0.85
Aortic SBP (mmHg)	141.1 (18.4)	133.3 (16.7)	140.1 (17.4)	132.7 (19.5)	-0.4 (-3.9, 3.1)	0.82
Aortic DBP (mmHg)	72.2 (6.7)	70.0 (6.3)	72.1 (5.4)	70.0 (5.9)	-0.2 (-1.4, 1.1)	0.79
Augmentation index (%)	31.5 (11.5)	29.4 (11.6)	31.6 (12.8)	27.6 (11.8)	2.0 (-0.8, 4.7)	0.16
Pulse wave velocity (m/s)	9.4 (1.6)	9.3 (1.6)	9.4 (1.7)	9.3 (1.8)	-0.0 (-0.2, 0.1)	0.81
Peak reservoir pressure (mmHg)	124.9 (17.7)	118.8 (15.7)	125.0 (15.7)	118.6 (17.6)	0.2 (-3.2, 3.7)	0.90
Peak excess pressure (mmHg)	29.0 (8.8)	25.6 (7.8)	27.6 (8.4)	25.4 (8.5)	-1.2 (-3.2, 0.8)	0.23
Reservoir pressure integral (mmHg.s)	91.7 (18.0)	83.2 (16.8)	92.2 (20.8)	84.1 (20.9)	-0.2 (-4.1, 3.6)	0.91
log _e (excess pressure integral (mmHg.s))	1.59 (0.38)	1.40 (0.41)	1.53 (0.43)	1.35 (0.43)	-0.01 (-0.11, 0.08)	0.77
Backward pressure amplitude (mmHg)	29.0 (7.1)	26.2 (6.4)	29.0 (7.4)	26.0 (7.9)	0.2 (-1.2, 1.6)	0.77
Forward pressure amplitude (mmHg)	40.3 (8.2)	37.6 (8.2)	39.5 (8.4)	37.3 (9.5)	-0.5 (-2.3, 1.3)	0.58
log _e (wave reflection index) ($\times 10^{-2}$)	-119.3 (35.0)	-120.2 (28.2)	-113.0 (33.1)	-122.5 (27.3)	8.7 (-0.0, 17.5)	0.05

SBP=systolic blood pressure; DBP=diastolic blood pressure.

Table S6. Correlations of deseasonalized 25(OH)D concentration (baseline and change*) with changes* in arterial function measures in the vitamin D group

Variable	Correlation coefficient (95% confidence interval) [†]	
	Baseline 25(OH) [‡]	Change in 25(OH) [§]
Pulse rate	-0.03 (-0.28, 0.21)	0.17 (-0.00, 0.33)
Brachial SBP	0.15 (-0.03, 0.34)	-0.23 (-0.43, 0.01)
Brachial DBP	0.18 (-0.02, 0.36)	-0.20 (-0.39, 0.02)
Aortic SBP	0.21 (0.01, 0.42)	-0.25 (-0.42, -0.02)
Aortic DBP	0.11 (-0.06, 0.28)	-0.13 (-0.33, 0.10)
Augmentation index	0.18 (0.00, 0.34)	-0.23 (-0.39, -0.06)
Pulse wave velocity	0.22 (0.02, 0.40)	-0.29 (-0.46, -0.08)
Peak reservoir pressure	0.24 (0.07, 0.42)	-0.31 (-0.48, -0.09)
Peak excess pressure	-0.12 (-0.32, 0.12)	0.17 (-0.04, 0.35)
Reservoir pressure integral	0.08 (-0.12, 0.29)	-0.29 (-0.44, -0.11)
log _e (excess pressure integral)	-0.07 (-0.30, 0.17)	0.10 (-0.09, 0.28)
Backward pressure amplitude	0.18 (-0.05, 0.42)	-0.28 (-0.45, -0.06)
Forward pressure amplitude	0.23 (0.02, 0.44)	-0.28 (-0.43, -0.09)
log _e (wave reflection index)	0.06 (-0.18, 0.29)	-0.11 (-0.31, 0.10)

SBP=systolic blood pressure; DBP=diastolic blood pressure.

*Follow-up minus baseline.

[†]Adjusted for age, sex and ethnicity.

[‡]Among those with baseline deseasonalized 25(OH)<65 nmol/L.

[§]Among those with baseline deseasonalized 25(OH)<50 nmol/L (vitamin D deficiency).