Paper 2: Vitamin D

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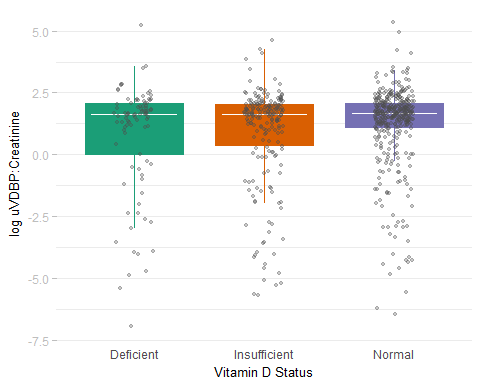
# PAPER 2: VITAMIN D RESULTS

### Subject Characteristics

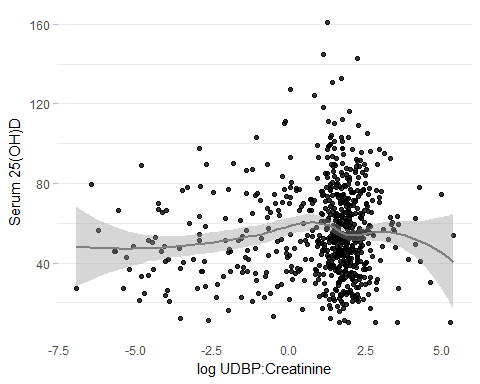
## Stratified by vitdStatus  
## Deficient   
## n 89   
## Age (mean (sd)) 45.61 (8.39)   
## Sex = Male (%) 22 (24.7)   
## Ethnicity (%)   
## European 38 (42.7)   
## Latino/a 10 (11.2)   
## Other 23 (25.8)   
## South Asian 18 (20.2)   
## BMI (mean (sd)) 34.12 (7.18)   
## Waist (mean (sd)) 104.62 (15.01)   
## eGFR (mean (sd)) 102.64 (14.78)   
## ACR (median [IQR]) 0.54 [0.31, 0.95]   
## UrineCreatinine (mean (sd)) 12.68 (6.20)   
## UrineMicroalbumin (median [IQR]) 6.00 [2.99, 11.30]   
## UrinaryCalcium (mean (sd)) 2.04 (1.57)   
## UDBP (median [IQR]) 49.88 [7.57, 109.85]  
## udbpCrRatio (mean (sd)) 7.81 (20.39)   
## VitaminD (mean (sd)) 22.63 (5.49)   
## PTH (mean (sd)) 5.38 (2.18)   
## MET (mean (sd)) 35.77 (58.48)   
## Systolic (mean (sd)) 125.66 (14.84)   
## Diastolic (mean (sd)) 80.92 (9.96)   
## MeanArtPressure (mean (sd)) 95.83 (10.54)   
## OralContraceptive = 1 (%) 3 (7.3)   
## dmStatus (%)   
## NGT 71 (79.8)   
## PreDM 4 (4.5)   
## DM 14 (15.7)   
## Stratified by vitdStatus  
## Insufficient   
## n 202   
## Age (mean (sd)) 48.86 (9.62)   
## Sex = Male (%) 76 (37.6)   
## Ethnicity (%)   
## European 110 (54.5)   
## Latino/a 48 (23.8)   
## Other 28 (13.9)   
## South Asian 16 (7.9)   
## BMI (mean (sd)) 32.46 (6.52)   
## Waist (mean (sd)) 102.07 (15.60)   
## eGFR (mean (sd)) 95.59 (14.09)   
## ACR (median [IQR]) 0.57 [0.37, 0.94]   
## UrineCreatinine (mean (sd)) 12.51 (6.52)   
## UrineMicroalbumin (median [IQR]) 6.45 [3.00, 11.30]   
## UrinaryCalcium (mean (sd)) 2.51 (1.77)   
## UDBP (median [IQR]) 54.25 [12.63, 93.22]  
## udbpCrRatio (mean (sd)) 6.46 (10.42)   
## VitaminD (mean (sd)) 40.55 (5.52)   
## PTH (mean (sd)) 4.78 (1.76)   
## MET (mean (sd)) 47.19 (68.96)   
## Systolic (mean (sd)) 126.39 (15.86)   
## Diastolic (mean (sd)) 80.56 (10.50)   
## MeanArtPressure (mean (sd)) 95.83 (11.50)   
## OralContraceptive = 1 (%) 3 (5.0)   
## dmStatus (%)   
## NGT 167 (82.7)   
## PreDM 4 (2.0)   
## DM 31 (15.3)   
## Stratified by vitdStatus  
## Normal p test   
## n 391   
## Age (mean (sd)) 51.19 (10.30) <0.001   
## Sex = Male (%) 117 (29.9) 0.054   
## Ethnicity (%) <0.001   
## European 296 (75.7)   
## Latino/a 40 (10.2)   
## Other 35 (9.0)   
## South Asian 20 (5.1)   
## BMI (mean (sd)) 29.89 (5.38) <0.001   
## Waist (mean (sd)) 96.42 (14.70) <0.001   
## eGFR (mean (sd)) 92.72 (14.48) <0.001   
## ACR (median [IQR]) 0.53 [0.34, 0.92] 0.637 nonnorm  
## UrineCreatinine (mean (sd)) 11.39 (6.47) 0.063   
## UrineMicroalbumin (median [IQR]) 5.00 [2.10, 11.00] 0.039 nonnorm  
## UrinaryCalcium (mean (sd)) 2.28 (1.71) 0.089   
## UDBP (median [IQR]) 46.47 [17.88, 88.92] 0.948 nonnorm  
## udbpCrRatio (mean (sd)) 7.23 (14.19) 0.718   
## VitaminD (mean (sd)) 70.56 (17.57) <0.001   
## PTH (mean (sd)) 4.29 (1.49) <0.001   
## MET (mean (sd)) 54.52 (63.91) 0.038   
## Systolic (mean (sd)) 126.44 (16.38) 0.916   
## Diastolic (mean (sd)) 79.90 (10.36) 0.609   
## MeanArtPressure (mean (sd)) 95.41 (11.57) 0.893   
## OralContraceptive = 1 (%) 8 (7.1) 0.845   
## dmStatus (%) 0.020   
## NGT 331 (84.7)   
## PreDM 25 (6.4)   
## DM 35 (9.0)

## Stratified by fVN  
## Baseline   
## n 729   
## Age (mean (sd)) 49.78 (10.03)   
## Sex = Male (%) 232 (31.8)   
## Ethnicity (%)   
## European 475 (65.2)   
## Latino/a 108 (14.8)   
## Other 89 (12.2)   
## South Asian 57 (7.8)   
## BMI (mean (sd)) 31.11 (6.18)   
## Waist (mean (sd)) 99.06 (15.30)   
## eGFR (mean (sd)) 94.99 (14.73)   
## ACR (median [IQR]) 0.54 [0.35, 0.95]   
## UrineCreatinine (mean (sd)) 11.83 (6.47)   
## UrineMicroalbumin (median [IQR]) 5.60 [2.55, 11.40]   
## UrinaryCalcium (mean (sd)) 2.32 (1.74)   
## UDBP (median [IQR]) 47.56 [15.30, 93.10]  
## VitaminD (mean (sd)) 55.42 (22.96)   
## PTH (mean (sd)) 4.56 (1.71)   
## Systolic (mean (sd)) 126.19 (16.00)   
## Diastolic (mean (sd)) 80.13 (10.32)   
## MeanArtPressure (mean (sd)) 95.48 (11.40)   
## diet\_milk (mean (sd)) NaN (NA)   
## diet\_cal (mean (sd)) NaN (NA)   
## diet\_supp\_cal (mean (sd)) NaN (NA)   
## diet\_supp\_vitd (mean (sd)) NaN (NA)   
## OralContraceptive = 1 (%) 16 (7.1)   
## dmStatus (%)   
## NGT 601 (82.4)   
## PreDM 38 (5.2)   
## DM 90 (12.3)   
## Stratified by fVN  
## 3Year   
## n 636   
## Age (mean (sd)) 54.64 (9.97)   
## Sex = Male (%) 190 (29.9)   
## Ethnicity (%)   
## European 455 (71.5)   
## Latino/a 65 (10.2)   
## Other 65 (10.2)   
## South Asian 51 (8.0)   
## BMI (mean (sd)) 31.30 (6.35)   
## Waist (mean (sd)) 100.28 (15.21)   
## eGFR (mean (sd)) 89.33 (17.11)   
## ACR (median [IQR]) 0.63 [0.43, 1.06]   
## UrineCreatinine (mean (sd)) 11.91 (9.05)   
## UrineMicroalbumin (median [IQR]) 5.99 [4.00, 9.00]   
## UrinaryCalcium (mean (sd)) NaN (NA)   
## UDBP (median [IQR]) 39.96 [8.55, 89.91]  
## VitaminD (mean (sd)) 74.00 (26.37)   
## PTH (mean (sd)) 4.99 (1.83)   
## Systolic (mean (sd)) 127.29 (14.98)   
## Diastolic (mean (sd)) 80.04 (10.05)   
## MeanArtPressure (mean (sd)) 95.79 (10.65)   
## diet\_milk (mean (sd)) 0.94 (1.07)   
## diet\_cal (mean (sd)) 919.97 (478.88)   
## diet\_supp\_cal (mean (sd)) 201.50 (321.41)   
## diet\_supp\_vitd (mean (sd)) 285.83 (271.91)   
## OralContraceptive = 1 (%) 0 (NaN)   
## dmStatus (%)   
## NGT 380 (59.7)   
## PreDM 136 (21.4)   
## DM 120 (18.9)   
## Stratified by fVN  
## 6Year p test   
## n 487   
## Age (mean (sd)) 57.24 (9.66) <0.001   
## Sex = Male (%) 140 (28.7) 0.494   
## Ethnicity (%) 0.033   
## European 355 (72.9)   
## Latino/a 48 (9.9)   
## Other 47 (9.7)   
## South Asian 37 (7.6)   
## BMI (mean (sd)) 31.04 (6.37) 0.764   
## Waist (mean (sd)) 100.68 (15.36) 0.149   
## eGFR (mean (sd)) 90.57 (14.95) <0.001   
## ACR (median [IQR]) 0.66 [0.46, 1.04] <0.001 nonnorm  
## UrineCreatinine (mean (sd)) 11.42 (6.65) 0.517   
## UrineMicroalbumin (median [IQR]) 5.99 [5.00, 10.00] <0.001 nonnorm  
## UrinaryCalcium (mean (sd)) NaN (NA) NA   
## UDBP (median [IQR]) 48.91 [12.04, 89.70] 0.135 nonnorm  
## VitaminD (mean (sd)) 84.50 (28.17) <0.001   
## PTH (mean (sd)) 4.66 (1.94) <0.001   
## Systolic (mean (sd)) 125.95 (15.03) 0.277   
## Diastolic (mean (sd)) 79.52 (9.37) 0.560   
## MeanArtPressure (mean (sd)) 95.00 (10.35) 0.483   
## diet\_milk (mean (sd)) NaN (NA) NA   
## diet\_cal (mean (sd)) NaN (NA) NA   
## diet\_supp\_cal (mean (sd)) NaN (NA) NA   
## diet\_supp\_vitd (mean (sd)) NaN (NA) NA   
## OralContraceptive = 1 (%) 0 (NaN) NaN   
## dmStatus (%) <0.001   
## NGT 306 (62.8)   
## PreDM 90 (18.5)   
## DM 91 (18.7)

### Cross-Sectional



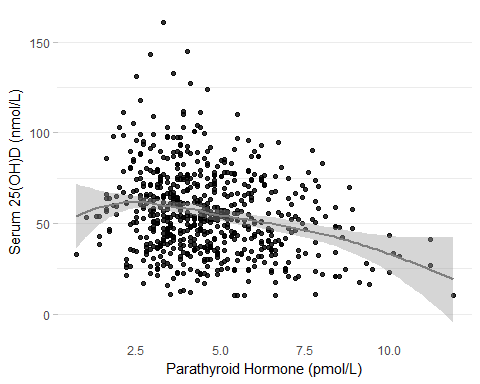
## # A tibble: 3 x 2  
## vitdStatus n  
## <ord> <int>  
## 1 Deficient 89  
## 2 Insufficient 202  
## 3 Normal 390  
## Df Sum Sq Mean Sq F value Pr(>F)   
## vitdStatus 2 25.3 12.649 3.69 0.0255 \*  
## Residuals 678 2324.0 3.428   
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
## Tukey multiple comparisons of means  
## 95% family-wise confidence level  
##   
## Fit: aov(formula = log(udbpCrRatio) ~ vitdStatus, data = vitd)  
##   
## $vitdStatus  
## diff lwr upr p adj  
## Insufficient-Deficient 0.1169287 -0.43633887 0.6701963 0.8730480  
## Normal-Deficient 0.4642198 -0.04663777 0.9750775 0.0837455  
## Normal-Insufficient 0.3472911 -0.02968365 0.7242659 0.0782303



##   
## Spearman's rank correlation rho  
##   
## data: VitaminD and udbpCrRatio  
## S = 51002000, p-value = 0.4183  
## alternative hypothesis: true rho is not equal to 0  
## sample estimates:  
## rho   
## 0.03106497

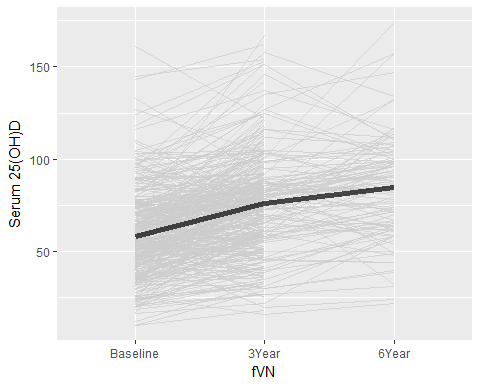
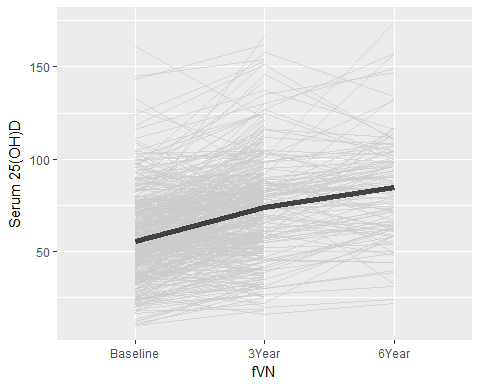
|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Yterms | Xterms | term | estCI | p |
| VitaminD | udbpCrRatio | <-Xterm | -0.05 (-0.17, 0.07) | 0.4 |
| VitaminD | udbpCrRatio | <-Xterm | -0.08 (-0.18, 0.03) | 0.17 |
| VitaminD | udbpCrRatio | ageBase | 0.25 (0.09, 0.41) | <0.001 |
| VitaminD | udbpCrRatio | SexMale | 1.78 (-1.61, 5.17) | 0.3 |
| VitaminD | udbpCrRatio | EthnicityEuropean | 15.17 (11.79, 18.56) | <0.001 |
| VitaminD | udbpCrRatio | MET | 0.01 (-0.01, 0.04) | 0.32 |
| VitaminD | udbpCrRatio | BMI | -1.21 (-1.46, -0.95) | <0.001 |
| VitaminD | udbpCrRatio | SeasonWinter | -6.75 (-9.82, -3.68) | <0.001 |
| VitaminD | udbpCrRatio | fDMdiabetes | -9.72 (-14.59, -4.85) | <0.001 |

PTH



|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Yterms | Xterms | term | estCI | p |
| VitaminD | PTH | <-Xterm | -3.24 (-4.23, -2.24) | <0.001 |

### Progression



### Generalized Estimating Equations

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Yterms | Xterms | term | estCI | p |
| VitaminD | Baseline uVDBP (ug/mL) | Baseline uVDBP (ug/mL) | -3.09 (-26.23, 20.05) | 0.79 |
| VitaminD | Baseline uVDBP (ug/mL) | Follow-up Duration (months) | 0.38 (0.33, 0.43) | <0.001 |
| VitaminD | Baseline uVDBP (ug/mL) | Baseline Age (years) | 0.35 (0.18, 0.52) | <0.001 |
| VitaminD | Baseline uVDBP (ug/mL) | SexMale | 0.59 (-2.97, 4.16) | 0.74 |
| VitaminD | Baseline uVDBP (ug/mL) | EthnicityEuropean | 15.65 (12.09, 19.21) | <0.001 |
| VitaminD | Baseline uVDBP (ug/mL) | BMI | -1.33 (-1.58, -1.07) | <0.001 |
| VitaminD | Baseline uVDBP (ug/mL) | fDiabetesdiabetes | 8.79 (-4.64, 22.22) | 0.2 |
| VitaminD | Baseline uVDBP (ug/mL) | SeasonWinter | -6.02 (-9.07, -2.96) | <0.001 |
| VitaminD | Baseline uVDBP (ug/mL) | Baseline uVDBP (ug/mL):SeasonWinter | 6.45 (-21.33, 34.23) | 0.65 |

