**eTable 1: Primary and secondary outcomes from baseline to week 24 in three groups (completers analysis)**

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|  | **n** | **24 weeks** | **Treatment comparison** |
|  | **LSM difference (SE); 95% CI; p value** |
|  | **1600IU VD3+FA\*A** | **1600IU VD3+FA\*FA** | **FA\*A** |
| **Primary endpoint** |  |  |  |  |  |
| MoCA |  |  |  |  |  |
| A | 117 | 0.349 (0.371) | 0.659 (0.333)  | 0.251 (0.324) | 0.408 (0.33)  |
| FA | 126 | 0.757 (0.369) | (0.005, 1.313)  | (-0.387, 0.889) | (-0.242, 1.057) |
| 1600IU VD3+FA | 123 | 1.008 (0.369) | p=0.048 | p=0.44 | p=0.218 |
| **Secondary endpoints** |  |  |  |  |  |
| MMSE |  |  |  |  |  |
| A | 117 | -0.126 (0.275) | 0.078 (0.249)  | 0.182 (0.24)  | -0.104 (0.246)  |
| FA | 126 | -0.23 (0.274) | (-0.412, 0.567)  | (-0.291, 0.654) | (-0.588, 0.38) |
| 1600IU VD3+FA | 123 | -0.049 (0.274) | p=0.755 | p=0.45 | p=0.673 |
| AVLTIR |  |  |  |  |  |
| A | 117 | 8.288 (0.64) | 0.841 (0.571)  | -0.178 (0.56)  | 1.019 (0.57)  |
| FA | 126 | 9.308 (0.645) | (-0.282, 1.964)  | (-1.28, 0.923)  | (-0.101, 2.14)  |
| 1600IU VD3+FA | 123 | 9.13 (0.636) | p=0.142 | p=0.751 | p=0.074 |
| AVLTSR |  |  |  |  |  |
| A | 115 | -0.181 (0.419) | 0.112 (0.375)  | 0.033 (0.372)  | 0.078 (0.378)  |
| FA | 120 | -0.103 (0.427) | (-0.626, 0.849)  | (-0.699, 0.766)  | (-0.665, 0.821)  |
| 1600IU VD3+FA | 121 | -0.069 (0.419) | p=0.766 | p=0.929 | p=0.836 |
| AVLTLR |  |  |  |  |  |
| A | 109 | 0.004 (0.399) | 0.159 (0.353)  | -0.339 (0.35)  | 0.498 (0.36)  |
| FA | 115 | 0.501 (0.396) | (-0.535, 0.852)  | (-1.028, 0.35) | (-0.211, 1.206)  |
| 1600IU VD3+FA | 120 | 0.162 (0.389) | p=0.653  | p=0.334 | p=0.168 |
| SDMT |  |  |  |  |  |
| A | 117 | -1.991 (1.164) | 1.539 (1.044)  | 0.355 (1.017)  | 1.184 (1.038)  |
| FA | 126 | -0.807 (1.16) | (-0.515, 3.593) | (-1.645, 2.356)  | (-0.857, 3.224) |
| 1600IU VD3+FA | 123 | -0.452 (1.158) | p=0.141 | p=0.727 | p=0.255 |
| DSTF |  |  |  |  |  |
| A | 117 | -0.159 (0.173) | 0.109 (0.155) | 0.156 (0.151) | -0.047 (0.154) |
| FA | 126 | -0.206 (0.172) | (-0.196, 0.414)  | (-0.142, 0.454)  | (-0.35, 0.256)  |
| 1600IU VD3+FA | 123 | -0.05 (0.172) | p=0.483 | p=0.304 | p=0.761 |
| DSTB |  |  |  |  |  |
| A | 117 | -0.1 (0.151) | 0.224 (0.135)  | 0.301 (0.131) | -0.077 (0.134)  |
| FA | 126 | -0.177 (0.151) | (-0.041, 0.488)  | (0.042, 0.559)  | (-0.341, 0.187)  |
| 1600IU VD3+FA | 123 | 0.123 (0.15) | p=0.098 | p=0.023 | p=0.565 |
| TMTA |  |  |  |  |  |
| A | 117 | 8.97 (3.32) | -4.986 (2.977)  | -2.826 (2.903)  | -2.16 (2.96)  |
| FA | 126 | 6.81 (3.311) | (-10.842, 0.87)  | (-8.535, 2.882) | (-7.982, 3.662) |
| 1600IU VD3+FA | 123 | 3.984 (3.304) | p=0.095 | p=0.331 | p=0.466 |
| TMTB |  |  |  |  |  |
| A | 115 | 42.192 (10.787) | -18.974 (9.506)  | -1.284 (9.226)  | -17.689 (9.425) |
| FA | 126 | 24.503 (10.641) | (-37.67, -0.277)  | (-19.43, 16.862)  |  (-36.226, 0.848)  |
| 1600IU VD3+FA | 123 | 23.219 (10.588) | p=0.047 | p=0.889 | p=0.061 |
| SCWTTIE |  |  |  |  |  |
| A | 115 | 2.246 (2.753) | 2.159 (2.483) | -0.331 (2.409)  | 2.491 (2.469) |
| FA | 125 | 4.737 (2.749) | (-2.724, 7.042) | (-5.07, 4.407)  | (-2.365, 7.346) |
| 1600IU VD3+FA | 122 | 4.405 (2.738) | p=0.385 | p=0.891 | p=0.314 |
| SCWTRIE |  |  |  |  |  |
| A | 116 | 1.458 (0.745) | -0.258 (0.671)  | -0.577 (0.652) | 0.319 (0.666) |
| FA | 126 | 1.778 (0.742) | (-1.577, 1.062)  | (-1.86, 0.705)  | (-0.989, 1.628)  |
| 1600IU VD3+FA | 122 | 1.201 (0.742) | p=0.701 | p=0.377 | p=0.631 |
| 25 hydroxyvitamin D, nmol/L |  |  |  |  |
| A | 114 | 34.07 (2.779) | 27.885 (2.427)  | 36.767 (2.363)  | -8.882 (2.387)  |
| FA | 124 | 25.189 (2.721) | (23.108, 32.662)  | (32.117, 41.417)  | (-13.58, -4.184)  |
| 1600IU VD3+FA | 122 | 61.956 (2.663) | p<0.001 | p<0.001 | p<0.001 |
| Folate, mmol/L |  |  |  |  |  |
| A | 114 | -1.325 (2.319) | 32.987 (2.157) | 1.833 (2.108)  | 31.154 (2.125)  |
| FA | 124 | 29.828 (2.235) | (28.743, 37.23) | (-2.315, 5.981)  | (26.971, 35.336)  |
| 1600IU VD3+FA | 122 | 31.661 (2.216) | p<0.001 | p=0.385 | p<0.001 |
| Homocysteine, μmol/L |  |  |  |  |  |
| A | 115 | 1.399 (0.854) | 27.885 (2.427)  | 36.767 (2.363)  | -8.882 (2.387)  |
| FA | 124 | -3.541 (0.827) | (23.108, 32.662)  | (32.117, 41.417) | (-13.58, -4.184)  |
| 1600IU VD3+FA | 121 | -3.429 (0.815) | p<0.001 | p<0.001 | p<0.001 |

Data are LSM (SE). Abbreviations: AVLT, Auditory Verbal Learning Test; DST, The digit span; FA, folic acid; Ref: Referent category; MoCA, Montreal Cognitive Assessment;SCWT-RIE, Stroop Color-Word Test-Interference Trial-reaction interfered effects; SCWT-TIE, SCWT-time interfered effects; SDMT, symbol digit modalities test;TMTA, Trail Making Test A; TMTB, Trail Making Test B; VD3, vitamin D3.