Influence of Vitamin D Supplement on Immune Function of the Older Healthy People: A Pilot Randomised Control Trial

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Objectives: The study aims to investigate the influence of vitamin D (VD) supplement on immune function of the healthy older people.

Methods: Designed as a randomized control trial, 21 participants (55–85) years old took part and completed the study (20 White, 1 Indian) during May-November 2018 in Coventry, England. The participants were randomized into two groups, VD and control, stratified by age, gender and body mass index (BMI). The VD group (n = 11) took VD3 of 25 μg/day for 12 weeks, while the control group (n = 9) were only provided with educational information of VD. At baseline, 6 weeks and 12 weeks, plasma 25(OH)D levels and immune parameters including phagocytic activity of granulocytes and monocytes, tumour necrosis factor (TNF), interleukin 6 (IL-6), lymphocyte subsets (Th, Tc and natural killer cells), and fast blood glucose and lipid were measured. Dietary VD intake was analysed at baseline and week 12. The data were presented as mean ± standard error (SE) and analysed by two-way repeated measures ANOVA.

Results: The average age of the participants was (65.8 ± 1.7) years old (67.4 ± 2.7 in VD group and 64.5 ± 2.2 in control group). At baseline, 42.9% of the participants were VD deficiency (25(OH)D < 30 nmol/L), only 10% achieved a level of 25(OH)D > 50 nmol/L. There was a significant increase in plasma 25(OH)D concentration in VD group compared with that in the control group (visit∗treatment effect p = 0.002). The level of 25(OH)D in the VD group was increased rapidly at 6 weeks (from 38.4 ± 8.7 nmol/L at baseline to 51.0 ± 9.3 nmol/L) and little change has been observed at 12 weeks (51.8 ± 8.6 nmol/L). There was a significant visit∗treatment effect (p = 0.036) on the plasma creatinine concentration between two groups, indicating a decrease of plasma creatinine concentration in VD group (from 79.8 ± 7.0 μmol/L at baseline to 75.1 ± 5.4 μmol/L at week 12). There was a significant correlation between body mass index (BMI) and 25(OH)D concentration (P < 0.001). There was no significant effect of VD supplementation on parameters of immune function.

Conclusions: VD deficiency is common among this older population even during the summertime. VD supplementation at 25 μg/day for 12 weeks showed an anti-inflammatory effect.

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