Effect of alfacalcidol on inflammatory markers and T cell subsets in elderly with frailty syndrome: a double blind randomized controlled trial

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ABSTRACT
BACKGROUND: Alphacalcidol, a vitamin D analog, shows immune regulatory potency as it works on the macrophage and T cell to control inflammation and T cell dysregulation in elderly. None has been known about its effect on elderly with various states of frailty syndrome, which have different level of chronic low grade inflammation. This study aimed to determine the effect of alphacalcidol on inflammatory cytokines (IL-6, IL-10, g-IFN) and T cell subsets (CD4/CD8 ratio and CD8+ CD28-) of elderly with various stages of frailty syndrome. METHODS: from January to July 2017, a double blind randomized controlled trial (RCT) with allocation concealment, involving 110 elderly subjects from Geriatric Outpatient Clinic Cipto Mangunkusumo Hospital Jakarta, was conducted to measure the effect of 0.5 mcg alphacalcidol administration for 90 days to inflammatory cytokines (IL-6, IL-10, g-IFN) from PBMC culture supernatant, as well as CD4/CD8 and CD8+CD28- percentage using flow cytometry. Statistical analysis using SPSS version 20 was performed with t-test to measure mean difference. RESULTS: of 110 subjects involved in the RCT consisting of 27 fit, 27 pre-frail and 56 frail elderly, 25(OH)D serum level was found to be as low as 25.59 (12.2) ng/ml in alphacalcidol group and 28.27 (10.4) ng/ml in placebo group. Alphacalcidol did not decrease IL-6 (p=0.4) and g- IFN (p=0.001), but it increased IL-10 (p=0,005) and decreased IL6/IL10 ratio (p=0.008). Alphacalcidol increased CD4/CD8 ratio from 2.68 (SD 2.45) to 3.2 (SD 2.9); p=0.001 and decreased CD8+ CD28- percentage from 5.1 (SD 3.96) to 2.5 (1.5); p<0.001. Sub group analysis showed similar patterns in all frailty states. CONCLUSION: Alphacalcidol improves immune senescence by acting as anti-inflammatory agent through increased IL-10 and decreased IL6/IL-10 ratio and also improves cellular immunity through increased CD4/CD8 ratio and decreased CD8+ CD28- subset in elderly. This effect is not influenced by frailty state.