# Pengaruh Kolekalsiferol terhadap Sindrom Frailty pada Usia Lanjut dengan Pre-Frail: Kajian terhadap Kekuatan Gengam Tangan, Kecepatan Berjalan serta Reseptor Vitamin D, Interleukin-6 dan Insulin-Like Growth Factor -1 Monosit = The Effect of Cholecalciferol on Frailty Syndrome in Pre-frail Elderly: A Study on Hand Grip Strength, Walking Speed, Vitamin D Receptors, Interleukin-6, and Insulin-Like Growth Factor-1 Monocytes

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Abstrak

Prevalensi pre-frail tinggi pada usia lanjut dan kondisi tersebut dapat berubah menjadi frail. Kolekalsiferol diduga memiliki potensi untuk memperbaiki sindrom frailty pada usia lanjut. Penelitian ini bertujuan mengkaji pengaruh kolekalsiferol terhadap kekuatan genggam tangan, kecepatan berjalan serta reseptor vitamin D (vitamin D receptor/VDR), interleukin-6 (IL-6), dan insulin-like growth factor-1 (IGF-1) monosit pada usia lanjut dengan pre-frail. Uji klinis acak tersamar ganda dilakukan di Poliklinik Geriatri RSCM pada bulan April–Desember 2021. Sebanyak 120 subjek dirandomisasi menjadi kelompok yang mendapat kolekalsiferol 4.000 IU/hari (60 subjek) serta kelompok yang mendapat plasebo/hari (60 subjek). Seluruh subjek mendapat suplementasi kalsium laktat 500 mg /hari. Pengamatan dilakukan selama 12 minggu. Terdapat 57 subjek pada kelompok kolekalsiferol dan 56 subjek pada kelompok plasebo yang menjalani penelitian hingga selesai. Analisis intention to treat dilakukan untuk mengevaluasi luaran kekuatan genggam tangan dan kecepatan berjalan, sedangkan analisis per protokol untuk mengevaluasi VDR, IL-6 dan IGF-1 monosit. Pada akhir pengamatan, tidak terdapat perbedaan bermakna pada kekuatan genggam tangan (p = 0,228), kecepatan berjalan (p = 0,734), VDR monosit (p = 0,45), IL-6 monosit (p = 0,57) dan IGF-1 monosit (p = 0,72) antara kedua kelompok perlakuan. Tidak ada korelasi antara perubahan VDR, IL-6 dan IGF-1 monosit dengan kekuatan genggam tangan dan kecepatan berjalan. Terdapat peningkatan kadar 25(OH)D yang bermakna pada masing-masing kelompok perlakuan dan peningkatan bermakna pada kelompok kolekalsiferol dibandingkan plasebo. Pemberian kolekalsiferol 4.000 IU pada usia lanjut pre-frail 12 minggu meningkatkan kadar 25(OH)D secara bermakna, namun belum terbukti dapat memperbaiki kekuatan genggam tangan, kecepatan berjalan, meningkatkan VDR dan IGF-1 monosit serta menurunkan IL-6 monosit. Fungsi ginjal memiliki pengaruh terhadap efek kolekalsiferol pada IGF-1 monosit. Kolekalsiferol meningkatkan jumlah monosit dengan IGF-1+ pada eGFR > 90, namun tidak pada eGFR 30–59.
.....Pre-frail prevalence is higher in the elderly. Frailty status is a dynamic condition. Pre-frail can fall into a frail condition. Cholecalciferol is regarded to have potential effect to improve frailty syndrome in the elderly. This study aimed to determine the effect of cholecalciferol on hand grip strength, walking speed, vitamin D receptors, IL-6, and IGF-1 monocyte in pre-frail elderly. A randomized double-blind clinical trial study at the RSCM Geriatric Polyclinic was conducted from April to December 2021. A total of 120 subjects were randomized into groups receiving 4000 IU cholecalciferol/day (60 subjects) and groups receiving placebo/day (60 subjects). All subjects received calcium lactate supplementation 500 mg/day. Observations were made for 12 weeks. There were 57 subjects in the cholecalciferol group and 56 subjects in the placebo group who completed the study. An intention to treat analysis was performed to evaluate the

output of hand grip strength and walking speed, while a per protocol analysis was performed to evaluate monocyte VDR, IL-6 and IGF-1.There were no significant differences in hand grip strength (p = 0,228), walking speed (p = 0,734), VDR monocyte (p = 0,45), IL-6 monocyte (p = 0,57) and IGF-1 monocyte (p = 0,72) between treatment groups. There were no correlation between changes in the VDR, IL-6 and IGF-1 monocytes with changes in hand grip strength and walking speed. There was a significant increase in 25(OH)D levels in each group and a significant difference between groups. Supplementation of cholecalciferol 4.000 IU daily for 12 weeks increased serum 25(OH)D level significantly, however it did not improve hand grip strength and walking speed, and did not affect VDR, IL-6 and IGF-1 monocytes in pre-frail elderly. Kidney function had an influence on the effect of cholecalciferol on monocyte IGF-1. Cholecalciferol increased the number of monocytes with IGF-1+ at eGFR > 90, but not at eGFR 30–59.