

# Association of Changes in Lipid Levels With Changes in Vitamin D Levels in a Real-world Setting

## Background

- Vitamin D deficiency is associated with cardiovascular disease.<sup>1</sup> However, data related to the role of vitamin D supplementation in cardiovascular disease management have been mixed.<sup>2</sup>
- A meta-analysis of 41 clinical trials reported that vitamin D supplementation may lead to a reduction in lipid levels, including serum total cholesterol (TC), low-density lipoprotein cholesterol (LDL-C), and triglycerides (TG).<sup>3</sup> Despite the large number of trials included in this meta-analysis, only 1,699 participants with vitamin D supplementation were represented. Thus, further study is warranted.
- **Objective:** Investigators of this study examined whether changes in lipid levels corresponded with changes in vitamin D levels in a real-world population of working-age adults.

## Methods

- The retrospective analysis included serum vitamin D and lipid levels of participants enrolled in an annual employer-sponsored screening program from 2017 to 2020.
- The study population was separated into 3 cohorts according to the testing years being compared.
  - Cohort 1: 2018 vs 2017 (n=5,580)
  - Cohort 2: 2019 vs 2018 (n=6,057)
  - Cohort 3: 2020 vs 2019 (n=7,249)
- Data were further stratified into 2 groups: one for individuals whose vitamin D levels increased  $\geq 10$  ng/mL and another for individuals whose vitamin D levels decreased  $\geq 10$  ng/mL over the corresponding 1-year time period; group sizes ranged from 2,334 to 4,393 individuals.
- Correlations between changes in lipid and vitamin D levels over the 1-year periods were assessed with multivariable linear regression analyses.

## Results

- The overall study population included 13,989 individuals; median ages (48 to 49 years) and proportion of women (~70%) were similar among the cohorts.
- Levels of TC, LDL-C, and TG decreased among groups with increased vitamin D levels and increased among groups with decreased vitamin D levels.
  - The differences in average changes in lipid levels between groups with increased and decreased vitamin D levels were statistically significant (all  $P < 0.001$ ) and ranged from
    - 10.71 to 12.02 mg/dL for TC
    - 7.42 to 8.59 mg/dL for LDL-C
    - 21.59 to 28.09 mg/dL for TG
- Between-group differences in average changes in lipid levels remained significant after adjusting for several relevant confounders, including age, sex, race, education, body mass index, blood pressure, smoking status, geographical location, and baseline levels of vitamin D and lipids (all  $P < 0.001$ ).
- Changes in high-density lipoprotein-cholesterol (HDL-C) levels did not significantly correspond with changes in vitamin D levels.

## Conclusions

- This retrospective study showed that vitamin D supplementation, inferred from increases in vitamin D levels over 1-year time periods, was associated with improvement in serum lipid profiles in a real-world setting.
- Conversely, decreases in vitamin D levels correlated with worsened lipid profiles.

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### Webpage

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