No effect of vitamin D supplementation on serum fibrinogen concentrations in adults aged ≥64 years

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High serum concentration of the acute phase protein fibrinogen is associated with tissue inflammation and is an independent risk factor for cardiovascular disease (CVD). Low vitamin D status is associated with an increased risk of CVD and the active form of the vitamin, 1,25-dihydroxyvitamin D\textsubscript{3}, is a potent immunomodulator. Furthermore, vitamin D supplementation has been shown to reduce serum concentrations of inflammatory markers such as C-reactive protein in vitamin D deficient individuals. The aim of this study was to assess the effect of vitamin D supplementation on serum fibrinogen concentrations in a group of apparently healthy adults aged ≥64 years recruited in Cork and Coleraine.

A total of 202 individuals (males, \( n = 81 \); females, \( n = 121 \)) were randomly assigned to receive either 5, 10 or 15 \( \mu \)g vitamin D\textsubscript{3} per day or placebo for 22 weeks. Serum vitamin D status (25-hydroxyvitamin D (25(OH)D)) and fibrinogen concentrations were measured at baseline and post intervention using commercially available ELISA kits.

Vitamin D status did not significantly correlate with serum fibrinogen concentrations at baseline or post intervention. One-way analysis of covariance (adjusted for age, sex, centre, body mass index and baseline concentrations) revealed that while vitamin D supplementation significantly increased vitamin D status, it did not alter fibrinogen concentrations.

\begin{tabular}{|c|c|c|c|c|}
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\textbf{Placebo (}\( n = 54 \)) & \textbf{5 \( \mu \)g/d} (\( n = 48 \)) & \textbf{10 \( \mu \)g/d} (\( n = 52 \)) & \textbf{15 \( \mu \)g/d} (\( n = 48 \)) & \textbf{P}$^\dagger$
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25(OH)D (nmol/l) & 59.07 (43.37, 78.64) & 51.84 (40.28, 71.34) & 55.53 (43.00, 72.26) & 55.09 (39.39, 70.82) & \textless 0.0001
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Fibrinogen (g/l) & 1.86 (1.25, 2.91) & 2.12 (1.44, 3.54) & 1.78 (1.25, 2.85) & 2.22 (1.31, 3.08) & 0.889
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\textsuperscript{25(OH)D, 25-hydroxyvitamin D.}
\textsuperscript{* Values are median (IQR).}
\textsuperscript{$^\dagger$ Effect of treatment assessed on log transformed data by ANCOVA. Different superscript letters denote significant differences between treatment groups (ANOVA).}

In conclusion, vitamin D supplementation had a significant dose-response effect on vitamin D status, but did not affect serum concentrations of the inflammatory marker fibrinogen in healthy older adults. These findings concur with previous research in vitamin D deficient adults. However, it has been suggested that 25(OH)D concentrations >100 nmol/l may be required for modulation of immune responses; concentrations higher than those observed in the current study, even after vitamin D supplementation.

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