

An observational study of the association of vitamin D status and other patient characteristics with COVID-19 severity and mortality

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Vitamin D deficiency has been proposed to adversely affect COVID-19 severity and clinical outcome^(1–4). The current study aimed to evaluate the association between vitamin D status and COVID-19 severity and clinical outcome after adjustment for other factors thought to affect outcome including age and gender.

The study included 114 patients from Connolly Hospital, Blanchardstown, Dublin, all of whom tested positive for COVID-19 between March 2020 and May 2020. The independent variables examined included vitamin D status and age, gender, ethnicity, BMI, smoking status and number of comorbidities. Vitamin D status was classified as 'deficient' (serum 25(OH)D <30nmol/L), 'insufficient' (serum 25(OH)D of 30–49.9nmol/L) and 'sufficient' (serum 25(OH)D ≥50nmol/L). The clinical outcomes assessed were ICU admission, oxygen requirement and mortality.

Out of the full cohort (n = 114), 64% were male and 17% were over the age of 70. One fifth (n = 23) of the participants did not survive. The most common comorbidity was hypertension (64%). When categorised according to vitamin D status (n = 94), 49 patients (52%) were deficient, 20 (21%) were insufficient and 25 (27%) had sufficient serum 25(OH)D levels. Low vitamin D status was associated with greater mortality on univariate analysis, with 80% of those who died presenting with 25(OH)D levels <30nmol/L vs. 46% of those who survived (P = 0.048). On multivariate regression analysis, the association between vitamin D deficiency (25(OH)D <30nmol/L) and mortality was attenuated (OR 10.37, 95% CI = 0.942–114.1, p = 0.056), but the association of vitamin D deficiency with increased requirement for oxygen therapy persisted (OR = 3.75, 95% CI = 1.01–13.9, P = 0.048). Males were more likely to require ICU admission (OR = 3.43, 95%CI = 1.01–11.65, P = 0.048) and oxygen therapy (OR = 3.34, 95% CI = 1.04–10.71, P = 0.042) than females. When adjusted for other confounders, patients over the age of 70 years were 21.5 times more likely to die than those under the age of 50 years (OR = 21.5, 95% CI = 2.25–205.4, P = 0.008).

In addition to older age (>70 years) and male gender which both predict poorer clinical outcome, low vitamin D status appears to be an independent risk factor for more severe disease and mortality in COVID-19.

References

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