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# Vitamin D and Inflammation: Potential Implications for Severity of Covid-19

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## Abstract

Background Recent research has indicated that vitamin D may have immune supporting properties through modulation of both the adaptive and innate immune system through cytokines and regulation of cell signalling pathways. We hypothesize that vitamin D status may influence the severity of responses to Covid-19 and that the prevalence of vitamin D deficiency in Europe will be closely aligned to Covid-19 mortality. Methods We conducted a literature search on PubMed (no language restriction) of vitamin D status (for older adults) in countries/areas of Europe affected by Covid-19 infection. Countries were selected by severity of infection (high and low) and were limited to national surveys or where not available, to geographic areas within the country affected by infection. Covid-19 infection and mortality data was gathered from the World Health Organisation. Results Counter-intuitively, lower latitude and typically 'sunny' countries such as Spain and Italy (particularly Northern Italy), had low mean concentrations of 25(OH)D and high rates of vitamin D deficiency. These countries have also been experiencing the highest infection and death rates in Europe. The northern latitude countries (Norway, Finland, Sweden) which receive less UVB sunlight than Southern Europe, actually had much higher mean 25(OH)D concentrations, low levels of deficiency and for Norway and Finland, lower infection and death rates. The correlation between 25(OH)D concentration and mortality rate reached conventional significance (P=0.046) by Spearman's Rank Correlation. Conclusions Optimising vitamin D status to recommendations by national and international public health agencies will certainly have benefits for bone health and potential benefits for Covid-19. There is a strong plausible biological hypothesis and evolving epidemiological data supporting a role for vitamin D in Covid-19.

## Related information

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