

Dietary supplementation with 5000 IU/day of vitamin D for 12 weeks leads to improved lung function in asthmatic adults

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Vitamin D deficiency has been linked to asthma in adults and is thought to be associated with reduced lung function⁽¹⁾. Previous observational studies found an association between low serum or plasma vitamin D (25(OH)D) concentrations and reduced lung function in asthmatics⁽²⁾. Clinical trials investigating the effect of vitamin D supplementation in people with asthma have mainly focussed on children⁽³⁾, with varied results in adults^(4, 5, 6). Many clinical trials have investigated the effect of bolus dosing and have focussed on patient outcomes without accounting for levels of underlying inflammation. The aim of the present research was to conduct a 12-week randomised controlled trial investigating the effect of a daily 5000 international unit (IU, 125µg) vitamin D3 supplement on lung function and inflammatory markers in adults with mild to moderate asthma.

This study was approved by the Faculty Research Ethics Committee and registered with clinicaltrials.gov (NCT04117581). A total of 32 participants were recruited and randomised to receive either a daily 5000 IU vitamin D3 supplement or identical placebo for 12 weeks. A total of 27 participants completed the trial. The primary outcome was lung function measured by ratio of forced expiratory volume in one second (FEV¹) to forced vital capacity (FVC). Secondary outcomes included asthma control test score and measurement of inflammatory biomarkers (CRP, IFN-γ, TNF-α, IgE, IL-10, IL-13 and IL-4).

Insufficient (< 50 nmol/L) and deficient (< 25nmol/L) vitamin D status was common in participants at baseline: 59% and 22% respectively. The intervention resulted in a significantly higher increase in the mean (± SD) ratio of FEV¹: FVC from baseline (week 0) to post-intervention (week 12) in the vitamin D group (+ 0.05 ± 0.06) compared to the placebo group (+ 0.006 ± 0.04, p=0.04). There was no effect of the intervention on asthma control test scores or the inflammatory biomarkers measured. However, there was a strong, significant positive association between mean change in plasma 25(OH)D concentration and mean change in plasma IL-10 concentration (r=0.622, p=0.023). This suggests the improvement in participants' vitamin D status in the vitamin D group led to increased levels of this anti-inflammatory biomarker, which may contribute to reducing levels of inflammation in asthmatics.

A daily vitamin D3 supplement, at a dose above current UK recommendations, led to increased lung function in adult asthmatics and may be a useful adjunct to existing asthma control strategies.

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