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Vitamin D status in chronic obstructive pulmonary disease

F. R. Baldrick¹, J. S. Elborn^{2,3}, J. V. Woodside¹, K. Treacy², J. Bradley², B. Schock³, M. Ennis³,
K. Dollin¹, A. McGinty¹, I. S. Young¹ and M. C. McKinley¹

¹Centre for Public Health, Queen's University Belfast, BT12 6BJ, ²Respiratory Medicine Group, Belfast City Hospital, BT9 7AB, UK and ³Centre for Infection and Immunity, Queen's University Belfast, BT9 7BL, UK

Vitamin D is well known for its role in bone health and calcium homeostasis. However, emerging evidence suggests that vitamin D may also have an influence on other health issues such as type 2 diabetes, cardiovascular disease, cancer, autoimmune diseases and respiratory function^(1,2). Chronic obstructive pulmonary disease (COPD) is characterised by airflow limitation and is associated with an abnormal inflammatory response⁽³⁾. It has been hypothesised that vitamin D deficiency may enhance chronic airway and systemic inflammation and increase the risk of infectious exacerbations⁽¹⁾ in COPD. Vitamin D status in this population is, therefore, of interest. The aim of the present study was to examine the prevalence of sub-optimal vitamin D status in a sample of patients with moderate to severe COPD and to compare the vitamin D status of a sub-sample of this patient group with healthy age-, sex-, and season-matched controls.

The serum 25-hydroxyvitamin D (25-OHD) levels of 81 Northern Irish patients with moderate to severe COPD (classified according to Global Initiative for Chronic Obstructive Lung Disease (GOLD) guidelines⁽³⁾) were measured using Ultra Performance Liquid Chromatography followed by tandem mass spectrometry (UPLC/MS/MS). Twenty-two COPD patients were matched for age-, sex-, and season of blood sample collection with healthy participants recruited from Northern Ireland at the same time as the COPD cohort.

The mean vitamin D status for male and female COPD patients was 35.3 (SD 23.3) nmol/l and 38.5 (SD 49.6) nmol/l, respectively ($P = 0.701$; Independent samples t-test). There was no significant difference in mean vitamin D status between those with moderate (32.3 (SD 20.2) nmol/l) compared to severe COPD (39.8 (SD 44.8) nmol/l) ($P = 0.372$; Independent samples t-test). Season of blood sample collection had no significant effect on vitamin D status in this group of COPD patients ($P = 0.116$; analysis of variance). Overall, almost half of the COPD patients (45.7%) were vitamin D deficient (<25 nmol/l), with 79% showing biochemical evidence of sub-optimal vitamin D status (<50 nmol/l). Only 10% of this sample had adequate vitamin D concentrations (>75 nmol/l). The vitamin D status of patients with moderate to severe COPD ($n = 22$) was significantly lower compared with healthy age-, sex-, and season-matched controls ($n = 22$) (36.7 (SD 36.8) nmol/l versus 52.5 (SD 23.2) nmol/l, respectively; $P = 0.003$; Independent samples t-test).

Suboptimal vitamin D status was prevalent in this sample of patients with moderate to severe COPD. Furthermore, patients with moderate to severe COPD had significantly lower vitamin D concentrations compared to healthy age-, sex-, and season-matched controls. The potential role of vitamin D supplementation in the prevention or management of COPD is worthy of further investigation.

1. Janssens W, Lehouck A, Carremans C *et al.* (2009) *Am J Resp Crit Care Med* **179**, 630–636.

2. Gilbert CR, Arum SM & Smith CM (2009) *J Can Thorac Soc* **16**, 75–80.

3. Global Initiative for Chronic Obstructive Lung Disease (GOLD) guidelines. (2001) NHLBI/WHO Workshop Report.