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Vitamin D status and disease activity in systemic lupus erythematosus in Northern Ireland

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Systemic lupus erythematosus (SLE) is a complex autoimmune disease with no known cure and an unclear etiology. Patients often suffer from photosensitivity and for this reason are advised to stay out of direct sunlight and to wear a sun protection factor (SPF) of ≥ 15 . Approximately 98% of vitamin D synthesis in the skin is blocked by a SPF of 15⁽¹⁾; therefore, individuals with SLE may be at greater risk of vitamin D deficiency. Vitamin D in its hormonally-active form has immunoregulatory properties and may impinge on the pathology of autoimmune diseases⁽²⁾. The objectives of the present study were to assess vitamin D status in patients with SLE in comparison with age- and gender-matched controls and to compare dietary vitamin D intake and status with disease activity in SLE.

Patients with SLE were recruited between December 2005 and February 2006 as part of a larger study⁽³⁾. Control volunteers were recruited from University of Ulster staff. Vitamin D intakes were estimated from 4 d food diaries and vitamin D status was assessed by measuring plasma 25-hydroxyvitamin D (25(OH)D) using the OCTEIA 25(OH)D enzyme immunoassay (Immunodiagnostic Systems Ltd, Boldon, Tyne and Wear, UK). Disease activity was measured using the revised systemic lupus activity measure (SLAM-R)⁽⁴⁾.

Mean dietary vitamin D intakes for the SLE (n 19) and control (n 19) groups were 2.8 (SD 2.6) μg and 2.2 (SD 1.3) μg respectively. Results from an independent t-test indicated individuals with SLE had significantly higher serum 25(OH)D (70.6 (SD 37.3) nmol/l) than controls (56.0 (SD 18.5) nmol/l; $P=0.022$) with 32% and 44% of SLE and controls with suboptimal levels (<50 nmol/l) respectively. Mean SLAM-R score for those with SLE was 9.1 (SD 3.8). Analysis revealed a significant negative correlation between dietary vitamin D intake and SLAM-R (r 0.657, $P=0.006$) and a significant positive correlation between vitamin D status and SLAM-R (r 0.539, $P=0.017$).

In conclusion, intake of vitamin D in both patients with SLE and controls was inadequate and inadequate intake was related to greater disease activity in the patients with SLE. The positive correlation reported between serum 25(OH)D and disease activity in SLE may be as a result of those patients with more active disease receiving steroidal treatment. Steroids are routinely administered in conjunction with vitamin D and Ca and the level of serum 25(OH)D in SLE would support vitamin D supplementation use. These results are preliminary findings and further investigation is required to elucidate the role of vitamin D in SLE.

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