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**Citation:** Dong, H., Wong, S., Gainullina, I., Graham, A., Ussef, I. & Hirani, S. P. (2023). Prevalence of vitamin D deficiency in patients with spinal cord injury at admission to hospital: a single centre study in the UK. *Proceedings of the Nutrition Society*, 82(OCE1), E15. doi: 10.1017/s002966512300023x ISSN 0029-6651 doi: 10.1017/s002966512300023x

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**Prevalence of vitamin D deficiency in patients with spinal cord injury at admission to hospital: a single centred study in the UK.** By H Dong<sup>1\*</sup>, S Wong<sup>1,2,3\*</sup>, I Gainullina<sup>2</sup>, A Graham<sup>2</sup>, M Belci<sup>2</sup>, I Ussef<sup>3</sup> and SP Hirani<sup>1</sup> 1. *School of Health and Psychological Sciences, City, University of London, London, UK*, 2. *National Spinal Injuries Centre, Stoke Mandeville Hospital, Aylesbury, UK* and 3. *The Royal Buckinghamshire Hospital, Aylesbury, UK*. \*Co-first author.

Previous studies reported the prevalence of vitamin D deficiency in chronic spinal cord injured patients<sup>(1)</sup>. Vitamin D deficiency has been implicated as an etiologic factor responsible for osteoporosis and various skeletal and extra-skeletal issues in spinal cord injured patients<sup>(2)</sup>. However, very few data were available regarding vitamin D status in patients with acute spinal cord injury or immediately assessed at hospital admission. This retrospective study aimed to evaluate vitamin D status (indicated by serum 25(OH)D concentration) in spinal cord injured patients at admission to a UK spinal cord injury centre in January-December 2017 and to assess the characteristics of vitamin D deficiency in this patient group.

Only patients with serum 25(OH)D concentration records at admission were recruited. Vitamin D status was categorised as severe deficiency, deficiency, insufficiency and sufficiency, defined by serum 25(OH)D < 25 nmol/L, 25-50 nmol/L, 51-75 nmol/L, and > 75 nmol/L respectively that most studies with spinal cord injured patients adopted<sup>(1)</sup>. Various categorical and blood test parameters were retrieved from the patients' profiles. Data were presented as percentage or mean ± SD. Pearson Chi-Square, correlation, single linear regression, Mann Whitney U test and Kruskal Wallis were used to analyse the data.

Among 196 eligible patients, 74% were males vs 26% females, 92% were white Caucasians vs 8% non-white, 57% were traumatic vs 43% non-traumatic, and 42% were complete vs 58% incomplete spinal cord injury. The age was 50.5 ± 18.6 years old (18-90 y). The body mass index was 25.7 ± 5.9 kg/m<sup>2</sup> (16-46 kg/m<sup>2</sup>). The results found that 57% of the patients had vitamin D deficiency (serum 25(OH)D < 50 nmol/L), and 24% were severe vitamin D deficiency (serum 25(OH)D < 25 nmol/L), similar to the prevalence of severe vitamin D deficiency in the general population in the UK (23%)<sup>(3)</sup>. However male patients, patients admitted in wintertime (December-May), and patients with hyponatremia (serum sodium < 135 mEq/L) or caused by non-traumatic conditions had significant worse vitamin D status than their counterparts (28% males vs 11.8% females, P=0.019; 30.2% in winter vs 12.9% in summer, P=0.007; 32.1% non-traumatic vs 17.6% traumatic, P=0.025; 38.9% low serum sodium vs 18.8% normal serum sodium, P=0.010). There was a significant inverse association of serum 25(OH)D concentration with body mass index (r=-0.311, P=0.002), serum total cholesterol (r=-0.168, P=0.037) and creatinine concentrations (r=-0.162, P=0.024) that were also significant predictors to serum 25(OH)D concentration.

The overall severe vitamin D deficiency in patients with spinal cord injury at admission to hospital is similar to the general population, however patients in some subgroups had worse vitamin D status. Strategies for systematic screening and efficacy of vitamin D supplementation in patients with spinal cord injury need to be implemented and further

investigated in order to prevent the vitamin D deficiency-related chronic complications including bone mineral density, body composition and cardiovascular disease.

## References

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Word count: 448