

Vitamin D deficiency and its dependence on renal insufficiency in patients with Charcot neuroosteoarthropathy

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Background and aims: Alteration of bone metabolism in Charcot neuroosteoarthropathy (CNO) is a topic of interest. Several studies have suggested a link between vitamin D status and glucose metabolism, and higher prevalence of hypovitaminosis D among diabetic patients. Chronic kidney disease may be an important, but not the sole cause, of vitamin D deficiency in CNO patients. The aim of our study was to assess vitamin D deficiency and its dependence on renal insufficiency in CNO patients. **Patients and methods:** 48 patients with active CNO did not differ from 30 age- and sex-matched healthy subjects (mean age 52 ± 12 and 53 ± 8 years; male gender 59% and 66%, respectively). 25(OH)D was assessed by RIA (normal levels 9.2 – 45.2 ng/mL). Renal insufficiency was defined as an increase in S-creatinine by more than 140 $\mu\text{mol/L}$ (consistent with chronic kidney disease of stages 3, 4 and 5). Vitamin D deficiency and vitamin D insufficiency were defined as serum 25(OH)D levels of less than 10ng/mL and between 10-20 ng/mL, respectively. The seasonal variation of vitamin D levels between “summer time” (April to October) and “winter time” (November to February) was considered. **Results:** The distribution of vitamin D deficiency and insufficiency and satisfactory levels differed significantly between all CNO patients and healthy controls: 15 (31%), 22 (46%) and 11 (23%) in CNO patients and 2 (7%), 10 (33%) and 18 (60%) in controls, respectively; $p < 0.01$. Patients with CNO and normal renal function also had significantly more vitamin D insufficiency and deficiency than healthy controls - 9 (25%) and 16 (44%) in CNO patients and 2 (7%) and 10 (33%) in healthy controls, respectively; $p < 0.05$. The seasonal variation of incidence of vitamin D-deficient CNO patients between “winter time” - 6 (40%) and “summer time” - 9 (60%) was not significant. Patients with CNO and normal renal function (36 persons) did not differ significantly from those with CNO and chronic kidney disease (S-creatinine $> 120 \mu\text{mol/L}$, 12 subjects) in the distribution of vitamin D deficiency and insufficiency. Patients with CNO and more severe renal impairment (chronic kidney disease of stages 3, 4 and 5) also had not significantly more vitamin D insufficiency and deficiency compared with CNO patients and normal renal function: 5 (56%), 4 (44%) and 0 in CNO patients with severe renal impairment as against 10 (26%), 18 (46%) and 11 (28%) in CNO patients with normal renal function; $p = 0.098$. **Conclusion:** Results of our study show that not only the presence or absence of vitamin D deficiency and insufficiency in CNO patients are related to renal impairment, but other factors controlling vitamin D production and hydroxylation in patients with CNO seem to play an important role. This study was supported by grant MZO 00023001 from the Ministry of Health of the Czech Republic.