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Title: Vitamin D serum level and pulmonary exacerbations in children with cystic fibrosis

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Body: Background: 25-hidroxyvitamin D (25OHD) deficiency is frequently encountered in cystic fibrosis (CF) patients and possibly linked to an increased risk of pulmonary exacerbations (PE). Aim: To establish whether PE occur more frequently in 25OHD deficient CF children. Methods: Clinical and laboratory data gathered in a 5-year-period from patients aged 5-10 years were retrospectively analysed. 25OHD serum levels from annual review visits < 75 nmol/l were considered low and patients divided in 2 groups, accordingly. PE was defined as increased cough/sputum, fatigue, at least 10% decline in FEV1 and/or provision of antibiotic therapy (AT). Frequency of PE and number of hospitalisations per year were assessed. Results: A total of sixty-one 25OHD levels from 27 patients (14 males) were available in the observation period. There were 31 cases with normal levels (Group 1, mean 25OHD level 98.4 (±19.2) nmol/l, best annual FEV1 96.7 (±19.8) %predicted). In 30 cases the level was low (Group 2, mean 25OHD level 59.1 (±14.4) nmol/l, best annual FEV1 92.2 (± 22.8) %predicted). There was no significant difference between the groups in the proportion of patients who experienced one or more PE per year (61.3% vs. 50%, P=0.383). Moreover, we found no significant difference in the need for hospitalisation (16.1% vs. 13.3%, P=0.763) between the groups. Conclusions: Unlike similar studies, our data show no influence of 25OHD serum levels on the rate of PE. The role of vitamin D in CF warrants further study, in the contexts of chronic recurrent inflammatory disease and acute PE.