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Title: The impact of COPD and life-style factors on the vitamin D status of a Swedish population

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Body: Background: The prevalence of vitamin D insufficiency increases in countries with low annual UV radiation, which particularly afflicts individuals unable to perform outdoor activities, e.g. COPD patients. Vitamin D insufficiency may have a negative impact on physiological and psychological factors in COPD patients. Vitamin D levels in Swedish COPD patients are poorly investigated. Objective: To study the levels of plasma 25(OH)D in subjects with advanced COPD and lung healthy control subjects and to elucidate how 25(OH)D related to various factors of life style and COPD. A method to grade the individual annual UV-light exposure was also tested. Methods: Sixty-six Caucasians with advanced COPD (28 with LTOT) and 47 lung healthy age-matched control subjects were included at the end of the Swedish summer 2012, when the annual peak levels of 25(OH)D were assumed. Questionnaires about general health, life-style and dietary habits were answered and lung function tests and blood sampling were performed. Results: Half of the control subjects had insufficient blood levels of vitamin D (<75 nmol/L). COPD subjects had significantly lower serum-25(OH)D than the control subjects. Among vitamin D insufficient COPD subjects (58 of 66), 25(OH)D was significantly and positively correlated with exposure to UV-light and negatively correlated with COPD symptoms (MRC and CAT), quality of life (all domains of SGRQ) and inflammation (WBC and IL-6). Conclusions: Although blood samples were collected in late summer, vitamin D insufficiency was common among healthy individuals and even more so among COPD subjects. The serum-25(OH)D of vitamin D insufficient COPD subjects correlated with clinically important outcomes.