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Title: Serum vitamin D, physical activity and the obstructive sleep apnea syndrome

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Body: Introduction: Obstructive sleep apnea syndrome (OSAS) and vitamin D deficiency (VDD) are common conditions associated with excess adiposity and physical inactivity. Data on OSA, VDD and physical activity is lacking. Aims & objectives: We hypothesized that OSAS patients might have low levels of vitamin D and that this may be related to physical activity and body composition. Methods: Untreated subjects recently diagnosed with OSAS by nocturnal polysomnography gave informed consent. Weight, height and neck circumference were measured using standard protocols. The Diasorin assay was used to quantify 25-hydroxy-vitamin D (25(OH)D) levels. The SenseWear® armband (SWA) was used to assess free-living physical activity. Results: 37 individuals (25 male, 12 female; mean age = 52; mean BMI = 36.3kg/m²) completed the evaluation. No participant had sufficient vitamin D (>80nmol/L). Subjects with severe OSA had higher body mass index (BMI) ($p < 0.001$) and a trend to lower 25(OH)D levels. 25(OH)D correlated negatively with apnea-hypopnea index ($R = - 0.27$; $P = 0.058$), this was not fully explained by the relationship of 25(OH)D and BMI ($R=0.037$; $P = 0.417$). 239 days of SWA data were included (Inclusion criteria >90% wear time). Mean steps/day = 7,110 (6,710–25,454). Mean sedentary time = 21h7m (16h2m-23h32m). Conclusions: Among this sample, activity levels were low and adiposity was high. Lifestyle intervention should be encouraged for all overweight, sedentary OSAS cases. Consideration of hypovitaminosis D among OSAS cases is warranted, though its clinical significance is as of yet unclear. References: 1. Hollis BW. J Nutr. 2005 Feb;135(2):317-22. 2. Dawson-Hughes B et al. Osteoporos Int. 2005 Jul;16(7):713-6.