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Title: The effect of chronic intermittent hypoxia on bone homeostasis in children with sleep disordered breathing

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Body: INTRODUCTION: Airflow obstruction is an important risk factor for osteoporosis in adults. Therapies for bone-loss disorders could be based on shifting systemic acid base balance in the alkaline direction. The effect of chronic intermittent hypoxia in obstructive sleep apnea syndrome (OSAS) on bone homeostasis has never been evaluated. AIM: We evaluate the effect of OSAS on bone homeostasis and the efficacy of an alkaline diet to the bone remodelling in children. METHODS: Spot urinary hydroxyproline/creatinuria (UH/Cr, vg/ml) was measured as a markers of osteoblastic and osteoclastic activity in a group of children who underwent clinical assessment and polysomnography for OSAS. Children were randomly selected to be treated with an alkaline diet (group 1) or with steroid therapy (group 2). The UH/Cr was measured at baseline and after one month of treatment (T1). RESULTS: We studied 12 children (mean age $6,42 \pm 2,52$ years, 8 males). After one month, mean value of UH/Cr did not change (14,97 vg/ml vs 12,98 vg/ml). Four subjects (group 1) (mean age $7,9 \pm 2,7$ years, 3 males) showed a reduction of UH/Cr after alkaline diet (from 23,2 vg/ml to 15,8 vg/ml), UH/Cr did not decrease in group 2. In all children UH/Cr correlated with total sleep time ($r = -0,636$, $p < 0,05$), sleep efficiency ($r = -0,935$ $p < 0,001$) and wake after sleep onset ($r = 0,769$, $p < 0,05$), but not with sleep respiratory parameters. DISCUSSION: Our preliminary study showed that the efficacy of an alkaline diet to reduce urinary hydroxyproline. Although we did not find correlation with respiratory parameters, we found significant correlation with sleep fragmentations.