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TITLE

PREVALENCE OF LOW-T3 SYNDROME AND IMPACT ON BONE TURNOVER IN HYPOTHALAMIC AMENORRHEA

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ABSTRACT

Context: It is known that hypothalamic amenorrhea (HA) is associated with low bone turnover due to low gonadal homone levels. Estrogens are critical for activation of bone remodelling, suppression of bone reabsorption, increase of 1-25(OH)Vitamin D receptors expression. Other mechanisms include improper diet and unbalanced exercise, influencing the peripheric conversion of Thyroxine to active Triiodothyronine (low-T3).

Objective: To evaluate the prevalence of low-T3 syndrome and its influence on markers of bone metabolism.

Patients: 32 female patients with a history of secondary amenorrhea, lasting at least six months, aged 17–35 ys, with a BMI range 17.6–23.4 kg/mq.

Intervention: Morning blood sample collection for: FSH, LH, estradiol, fT3, fT4, TSH, osteocalcin, bone alkaline phosphatase, beta-crosslaps, Vitamin D and PTH.

Main outcome measures: Prevalence of low T3, evaluation of Bone Mineral Density (BMD) and osteocalcin in groups of patients divided according to fT3 levels; group A: low T3 (<2.4 pg/ml); group B: low.normal fT3 (2.4-2.6); group C: normal fT3 (>2.6).

Methods: BMD was determined by DXA scan at lumbar spine and neck of the right hip femur. The Hormones were assayed by chemiluminescence; osteocalcin and beta-crosslaps by electrochemiluminesce.

Results: DXA showed a reduction in BMD (osteopenia or osteoporosis) in 12 patients (T score from -1.1 to -2.9). Mean±SEM FSH and LH levels were respectively 5.1±0.3 mUI/ml and 2.6±0.6 mUI/ml; E2 levels were 29.6±4.1 pg/ml and 25(OH)-Vit.D 27.7±3.7 ng/ml (69% patients in the range of Vit.D deficiency). Osteocalcin levels were significantly higher in group C (26.7±1.5 ng/ml) vs group A (17.9±1.3) and B (18.7±1.1).

Conclusion: These preliminary data show a high prevalence of low-T3 in HA and suggest an influence on bone turnover. Further studies can show the possible therapeutic implication of these data.

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