

THE EFFECTS OF RECOMBINANT TSH ON BONE TURNOVER MARKERS AND SERUM OSTEOPROTEGERIN AND RANKL LEVELS

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The biologic function of thyroid stimulating hormone (TSH) is to regulate the synthesis and secretion of thyroid hormone from thyroid follicle cells. Recently it has been found that TSH-receptors are present both in osteoclast and osteoblast and that TSH can modulate bone remodeling independently of T3 and T4. In mice TSH inhibits both osteoclast and osteoblast activity, while rhTSH administration in postmenopausal thyroidectomized women causes a rise in bone specific alkaline phosphatase (BSAP) and a decrease of C-telopeptide of Type-I collagen (CTX) without any change in Osteoprotegerin (OPG) serum levels. Moreover older women with low levels of TSH showed an high risk of vertebral and hip fractures. We evaluated the role of TSH on bone remodeling in both sexes and the role of serum levels of OPG and RANKL regarding the effect of TSH on bone turnover. We studied 50 thyroidectomized patients with thyroid carcinoma on L-thyroxine therapy: 10 premenopausal women (aged 32.9±7.6), 10 postmenopausal women (aged 67.2±7.9) and 10 men (aged 49.5±13.9). A blood sample was drawn from each patient at baseline and three and five days after the rhTSH administration (0.9 mg i.m. once daily for the first two days). Sera were assayed for thyroid function (TSH, fT3, fT4) and bone turnover: BSAP, osteocalcin (BGP), N-terminal propeptide of type-I procollagen (PINP) as markers of bone formation, and CTX as marker of bone resorption, serum OPG and RANKL. In basal conditions serum TSH values were in low-normal range or suppressed with no differences between the three groups. Postmenopausal patients had significantly higher basal values of OPG and BSAP compared to premenopausal women and men. After the rhTSH administration, serum TSH values peaked at day 3, with any significant changes on bone turnover markers in all groups. Serum RANKL levels significantly increased after three days in postmenopausal patients and men returning to baseline values at day 5, while serum OPG levels did not change significantly. These preliminary data showed that TSH has not effect on bone markers while the increase of RANKL could suggest an osteoblast activation with secondary bone turnover adjustment.