

JOURNAL OF ENDOCRINOLOGICAL INVESTIGATION

Vol. 30, Suppl. to No. 4, 2007

XXXII NATIONAL CONGRESS OF THE
ITALIAN SOCIETY OF ENDOCRINOLOGY

Verona, Centro Congressi Veronafiere
June 13-16, 2007



Published by Editrice Kurtis - Via Luigi Zoja, 30 - 20153 Milano, Italy
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JOURNAL OF ENDOCRINOLOGICAL INVESTIGATION

Official Journal of
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The Journal of Endocrinological Investigation is published monthly

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EFFECTS OF L-THYROXIN TREATMENT ON BONE MINERAL DENSITY IN POST-MENOPAUSAL PATIENTS WITH MULTINODULAR GOITER

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Aim of the study. To evaluate the long-term effect of L-thyroxin (LT4) on bone mineral density (BMD) in post-menopausal patients undergoing treatment for multinodular goiter. **Patients and methods.** Ninety nine post-menopausal women were selected for this study after having excluded secondary causes of bone demineralization (genetic, endocrine-metabolic, osteoarticular, hematologic, other drug treatment and prolonged immobilization). All patients were diagnosed to have multinodular goiter which required LT4 treatment. The following endpoints were evaluated before (T0) and after 1 year (T1) of treatment with LT4: lumbar spine BMD using DXA, calcemia, calciuria, alkaline phosphatase and hydroxyprolinuria. **Results.** The patients enrolled had a mean age of 53.2 ± 0.2 years, a mean body mass index of 20.5 ± 0.3 (range 17-32) kg/m^2 , and they had menarche at the mean age of 14.6 ± 0.2 years (range 10-18 years). They were on menopause by 6.0 ± 0.3 years (range 0-14 years) which was iatrogenic (post-surgery) in 40% of them. 18% of the patients were cigarette smokers (8-40 cigarette/day). Forty two percent of the patients enrolled in this study was on menopause by < 5 years. About half of the cases were under hormone replacement therapy (51%). Treatment with LT4, as expected caused a significant ($p > 0.001$) reduction of TSH serum levels at T1. The overall mean T-score was -0.24 ± 0.07 at T0 and -0.64 at T1 ($p < 0.001$). Calcium serum level at T1 did not vary significantly compared to T0, whereas the excretion of calcium increased significantly ($p = 0.002$). Serum alkaline phosphatase serum and urine hydroxyproline levels increased significantly at T1 ($p < 0.001$) compared to T0. At T1, 34 patients (34.3%) showed osteopenia not present at T0. Their LT4-related osteopenia was strongly associated with one or more of the following risk factors: familiarity in 44% ($n = 15$), menarche ≥ 15 years in 79% ($n = 27$), history of amenorrhea in 59% ($n = 20$). On the contrary, osteopenia was not influenced by the length of menopause. **Conclusion.** This study suggests that long-term LT4 treatment induced osteopenia in about one third of the patients treated. This significant negative effect on BMD, which seems to be influenced by the presence of one or more risk factors, should be considered in menopausal women with multinodular goiter before LT4 treatment.