



## HYPOTHYROIDISM

### Levothyroxine use in the elderly is associated with an increased risk of fractures

#### BACKGROUND

Thyroid hormone has direct effects on bone. Untreated hyperthyroidism is thought to increase the risk of fractures, especially in the elderly and postmenopausal women. Previous studies have shown that hyperthyroid women as well as hypothyroid women on a dose of levothyroxine that suppresses their TSH have a slightly lower bone mineral density and an increased risk of osteoporosis than women with normal thyroid function. It is largely through some of these studies that more attention is paid to adjusting the levothyroxine dose in hypothyroid women to maintain the TSH in the normal range. To date, an increased risk of fractures has not been reported in women treated with TSH-suppressive doses of levothyroxine, possibly due to the fact that many women in the studies are younger with a low risk of fractures at baseline. This report is unique in the large number of levothyroxine users (>200,000) with outcomes that can be quantified by the Canadian national health system, which recorded new fractures at every emergency room visit and hospital admission in this population. The goal of this study was to determine if there is an increased risk of fracture in elderly women on levothyroxine.

#### THE FULL ARTICLE TITLE:

Turner MR et al. Levothyroxine dose and risk of fractures in older adults: nested case-control study. *BMJ* 2011;342:d2238.

#### SUMMARY OF THE STUDY

During the 5-year period ending March 31, 2007, 213,511 adults older than 70 years who received at least

one prescription for levothyroxine were identified and were followed for fractures over the next year. During the evaluation period, 22,236 (10.4%) of the subjects experienced a fracture; 88% of the subjects with fracture were women. Current users of levothyroxine had a higher risk of fracture than those who had used levothyroxine in the past. Among current levothyroxine users, there was an increased risk for all fractures as the daily dose of levothyroxine increased.

#### WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This study found a significant association between current levothyroxine use and increased risk of fractures in older adults (>70 years). A major problem with this study is that thyroid function was not determined in any of the patients. However, this study clearly provides further data to make sure patients are not on too high of a dose of levothyroxine and that their TSH remains in the normal range. This is especially true in women >70 years.

— Alan P. Farwell, MD

#### ATA THYROID BROCHURE LINKS

Hypothyroidism: [http://thyroid.org/patients/patient\\_brochures/hypothyroidism.html](http://thyroid.org/patients/patient_brochures/hypothyroidism.html)

Hyperthyroidism: [http://thyroid.org/patients/patient\\_brochures/hyperthyroidism.html](http://thyroid.org/patients/patient_brochures/hyperthyroidism.html)

Thyroid Hormone Treatment: [http://thyroid.org/patients/patient\\_brochures/hormonetreatment.html](http://thyroid.org/patients/patient_brochures/hormonetreatment.html)

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## **HYPOTHYROIDISM, continued**

### **ABBREVIATIONS & DEFINITIONS**

**Hypothyroidism:** a condition where the thyroid gland is underactive and doesn't produce enough thyroid hormone. Treatment requires taking thyroid hormone pills.

**Hyperthyroidism:** a condition where the thyroid gland is overactive and produces too much thyroid hormone. Hyperthyroidism may be treated with antithyroid meds (Methimazole, Propylthiouracil), radioactive iodine or surgery.

**Thyroid Stimulating Hormone (TSH):** produced by the pituitary gland that regulates thyroid function; also the best screening test to determine if the thyroid is functioning normally.

**Levothyroxine:** the major hormone produced by the

thyroid gland and available in pill form as Levoxy<sup>TM</sup>, Synthroid<sup>TM</sup>, Levothroid<sup>TM</sup> and generic preparations.

**Bone Mineral Density (BMD):** this is usually measured in the lumbar (lower) spine and the hip and the results give information as to the strength of the bone and the risk of fractures. The results are expressed as T scores, which as standard deviations from the average bone density in a person in their 20s, when bone mass is the highest. A T score of -1 to -2.5 is termed Osteopenia and a T score >2.5 is termed Osteoporosis.

**Osteoporosis:** a decrease in bone mineral density in which the individual is at a significantly increased risk for fractures with little or no trauma or force. This occurs with a bone mineral density T score of >-2.5. The areas at highest risk for osteoporotic fractures are the wrist, spine and hip.