# Albumin, T3 Deficiencies Tied to Fracture Risk

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HARROGATE, ENGLAND — Low serum albumin and T3 levels are independently predictive of vertebral fractures in women older than 50 years, a 10-year prospective study has shown.

Because albumin and T3 deficiencies are considered markers of frailty and sickness, the findings suggest that chronic poor health may itself be a risk factor for vertebral fracture, said Judith Finigan, principal investigator and research nurse in the bone metabolism group at the University of Sheffield (England).

To identify predictors of fracture in women between ages 50 and 85, the Sheffield investigators acquired baseline bone mineral density (BMD) measures and medical and lifestyle information from a population-based group of 375 women. They also collected fasting blood samples for measuring serum calcium, alkaline phosphatase, parathyroid hormone, creatinine, phosphate, albumin, and thyroid hormones.

All participants had spinal radiographs taken at baseline and at years 2, 5, 7, and 10, which were reviewed for incident vertebral fractures by a single radiologist. Nonvertebral fractures were confirmed by radiologist reports.

Cox regression analysis showed that numerous risk factors—including age; BMD at the lumbar spine, hip, or total body; years of estrogen exposure; and prevalent vertebral fracture—predicted fractures overall.

Low serum T3, low serum albumin, and low body fat were specifically predictive of vertebral fractures but not nonvertebral fractures. These measures remained significantly predictive, even after adjusting for age, Ms. Finigan reported at the annual conference of the National Osteoporosis Society. Neither TSH nor T4 predicted fracture, she noted.

The age-adjusted relative risks per standard deviation decrease for T3, albumin, and body fat were 1.71, 1.74, and 1.55, respectively. "T3 and albumin also predicted vertebral fracture independently of spine or hip BMD," said Ms. Finigan.

In a separate analysis of a larger cohort, the investigators examined the relationship between serum albumin and vertebral fractures in postmenopausal women from the placebo arms of the Hip Intervention Program (HIP) trial and the Vertebral Efficacy with Risedronate Therapy (VERT) trial.

**Because these deficiencies are markers of frailty and sickness, the findings suggest that chronic poor health may itself be a risk factor for vertebral fracture.**

At 3 years, 381 of 2,720 subjects had experienced one or more incident vertebral fractures. A multiple stepwise logistic regression analysis showed a 1.23 relative risk of vertebral fracture for each standard deviation decrease in serum albumin, after adjusting for femoral neck BMD, weight, and age.

As in the smaller study, low serum albumin was not associated with an increased risk of incident nonvertebral fractures in the larger population.

The findings of the second analysis "confirm the association between low baseline albumin levels and incident vertebral fractures," Ms. Finigan said.

Serum albumin and thyroid hormone measurements are recommended as part of a routine evaluation for osteoporosis in postmenopausal women. Patients with deficiencies in these may be candidates for antiresorptive treatment to reduce their risk of vertebral fractures, Ms. Finigan concluded. ■

## VERBATIM

*This 'is clearly the most definitive study to date looking at acupuncture for arthritis.'*

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