

## **Graves' disease with hyperthyroidism occasionally occurs after radioactive iodine therapy for nodular goiter**

**The background of the study.** Patients with nodular goiter may be treated with radioactive iodine (I-131) to decrease thyroid function or goiter size. However, this treatment may result in immunogenic hyperthyroidism (hyperthyroidism caused by Graves' disease). In this study, the frequency of the appearance of thyrotropin (TSH)-receptor antibodies (TSHR-Ab) characteristic of Graves' hyperthyroidism was determined in a large group of patients with goiter treated with I-131.

**How the study was done.** The study subjects were 999 patients with a nodular goiter or a diffuse (nonimmunogenic but autonomous [TSH-independent]) goiter who were treated with a high dose of I-131 because they had overt hyperthyroidism or subclinical hyperthyroidism (serum thyrotropin [TSH] concentration,  $\leq 0.1$  mU/L). The goals of I-131 therapy were to eliminate hyperthyroidism and the autonomously functioning thyroid tissue and to decrease goiter size.

Serum TSH, free T4, and TSHR-Ab were measured and thyroid ultrasonography and nuclear scanning were performed before and after I-131 therapy. Post-radioiodine Graves' hyperthyroidism was defined as overt clinical and biochemical hyperthyroidism, a high serum TSHR-Ab concentration, the appearance of hypoechogenicity on ultrasonography, and a homogeneous pattern of uptake on nuclear scan.

**The results of the study.** Fifteen of the 999 patients (1.5 percent) had Graves' hyperthyroidism after I-131 therapy. All 15 patients had overt hyperthyroidism with hypoechogenicity on ultrasonography, homogeneous uptake on nuclear scan, and high serum TSHR-Ab concentrations; 1 patient had Graves' eye disease. The hyperthyroidism occurred an average of 5 months after I-131 therapy.

Thirteen of the 999 patients (1.3 percent) had a transient rise in serum TSHR-Ab concentration, but not hyperthyroidism, after I-131 therapy.

**The conclusions of the study.** Patients with autonomous thyroid function