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# Clinical THYROIDOLOGY

VOLUME 23 • ISSUE 6

JUNE 2011

## **METFORMIN SHRINKS THYROID NODULES IN PATIENTS WITH INSULIN RESISTANCE**

Rezzonico J, Rezzonico M, Pusiol E, Pistoia F, Niepomnische H. **Metformin treatment for small benign thyroid nodules in patients with insulin resistance.** *Metab Syndr Relate Disord* 2011;9:69-75. Epub December 3, 2010.

### **SUMMARY**

### **BACKGROUND**

In a prior study, these authors found that individuals with hyperinsulinemia had an increased thyroid volume as well as an increased number of thyroid nodules.

### **METHODS**

Eighty women who were thyroid peroxidase antibody-negative and living in an iodine-sufficient area and who had insulin resistance (IR) and solid, benign, hyperplastic thyroid nodules were prospectively evaluated for nodule shrinkage using metformin, levothyroxine, or a combination of the two. Fourteen women did not complete follow-up, leaving 66 women with 75 thyroid nodules. IR was evaluated by homeostasis model assessment (HOMA; fasting serum insulin in microunits per milliliter multiplied by plasma glucose in millimoles per liter divided by 22.5); a HOMA index of >2.5 indicated IR. Nodule volume determined using ultrasound was calculated with the elliptical shape volume formula. Women who qualified were randomly assigned to four treatment groups and followed for 6 months: group 1 (n = 14; 19 nodules) was treated with metformin alone; group 2 (n = 18; 21 nodules) was treated with metformin and levothyroxine; group 3 (n = 19; 20 nodules) was treated with levothyroxine alone; and group 4 (n = 15; 15 nodules) were controls. The metformin dose was 1000 mg twice daily; the dose of levothyroxine was adjusted to keep the serum thyrotropin (TSH) level at 0.11 to 0.99 mU/L. Patients were treated for 6 months and then reevaluated using ultrasound.

### **RESULTS**

The characteristics of the patients in the groups were similar at baseline (mean age, 43; mean weight, 80 kg; mean body-mass index [the weight in kilograms divided by the square of the height in meters], 31; mean HOMA score, 3.3; mean TSH, 2.55; median nodule volume, 298 mm<sup>3</sup>). Patients treated with levothyroxine had a significant decrease in TSH (mean, 0.59 mU/L). Patients taking metformin had a significant decrease in their HOMA scores into the normal range. All patients on active treatment (groups 1 to 3) had

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