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Long-term follow-up studies on Iodine-131 treatment of hyperthyroid Graves' disease based on the measurement of thyroid volume by ultrasonography

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In the present series of studies, the long-term (four year) effect of 80 Gy of ^{131}I treatment was evaluated in patients with hyperthyroid Graves' disease whose thyroid volumes have been accurately estimated with a high resolution ultrasound scanner. One year after ^{131}I treatment, 23.1% (3 out of 13 patients) remained hyperthyroid, 69.2% (9 out of 13) became euthyroid, and 7.7% (1 out of 13) were in a hypothyroid state. Since three patients in a hyperthyroid state one year after treatment were subsequently treated with either antithyroid drugs or additional ^{131}I treatment, the remaining ten patients (9 euthyroid and 1 hypothyroid patients) have been followed up for three more years. Two patients developed a hypothyroid state three years after treatment and one patient four years after treatment. Overall, 60% (6 out of 10 patients) were in a euthyroid state and 40% (4 out of 10) in a hypothyroid state, four years after 80 Gy ^{131}I treatment. There was no significant difference between eu- and hypothyroid groups in the sex ratio, age, radiation dose, therapeutic dose, thyroid gland volume, 24-hr ^{131}I uptake, the effective half-life of ^{131}I in the thyroid or the duration of hyperthyroidism.

In our preliminary studies, the incidence of late hypothyroidism in our ^{131}I treatment is similar to those previously reported. These suggest that uncertain factor(s), such as inhomogeneity of iodine distribution in the thyroid, unequal sensitivity of the thyroid cells to the radiation, and/or persistent destructive effects of the autoimmune process may influence the long-term effect of ^{131}I treatment of Graves' disease.

Key words: radioiodine therapy, Graves' disease, thyroid volume