

## Three basic patterns of changes in serum thyroid hormone levels in Graves' disease during the one-year period after radioiodine therapy

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The purpose of this study was to clarify the characteristic patterns of the thyroid hormonal changes in Graves' disease during the one-year period after  $^{131}\text{I}$  therapy considering that few serial hormonal data during this period are available in the literature. **Methods:** The levels of serum  $\text{T}_3$ ,  $\text{T}_4$  and  $\text{FT}_4$  before and during one year were plotted as a function of time in 70 therapy courses of 58 patients without subsequent antithyroid or steroid therapy. **Results:** 35 euthyroid, 6 hypothyroid and 29 hyperthyroid states were obtained during one year after therapy. Although individual patients had individual hormonal changing patterns, 3 common basic patterns were observed from baseline to one month (early) and thereafter (late), respectively. The early patterns were a decrease in 54 (77%), a minimum change in 8 (11.5%) and an increase in 8 (11.5%). The late patterns were a stable state after an initial decrease with a bottom followed by an increase (valley pattern) in 47 (67%), a stable state after an initial increase with a peak followed by a decrease with a bottom and a subsequent re-increase (mountain pattern) in 12 (17%) and a late stable state after a gradual slow decrease without an obvious bottom near or till one year (downhill pattern) in 11 (16%). The bottom level and the degree of hormonal recovery from the bottom determined the stable euthyroid, hypothyroid or hyperthyroid state in 49 (86%) of 57 with the valley or mountain pattern. Most of the bottom levels (81%) and transient abnormal changes including transient hypothyroidism (93%, 13/14), peak or hyperthyroidism (85%, 11/13) and euthyroidism (67%, 10/15) appeared within 6 months. The post-therapeutic stable euthyroid, hypothyroid or hyperthyroid state could be judged from the hormonal patterns in 57% (39/68) from 2.5 to 6 months, in 18% (12/68) from 6 to 9 months and in 25% (17/68) thereafter. **Conclusion:** Although the changes in thyroid hormones are not constant in Graves' disease during one year after  $^{131}\text{I}$  therapy, there are three basic patterns; valley, mountain and downhill patterns from one month after therapy. The post-therapeutic stable state can be judged by the hormonal level recovered from the bottom in most patients.

**Key words:** thyroid, Graves' disease, hyperthyroidism,  $^{131}\text{I}$ , thyroid hormone