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Time to Thyroid Function Normalization in Graves' Disease Patients Initiating Methimazole Therapy

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Objective: Graves' disease is an autoimmune thyroid gland disorder and the most common cause of hyperthyroidism in developed countries. Methimazole is an effective therapy in treating this condition. Initial dosing strategies and titration approaches vary widely among clinicians—some favor starting with a loading dose followed by a rapid taper. In contrast, others prefer initiating therapy with a lower dose and tapering gradually over time. In this study, we aimed to evaluate the time for thyroid function tests to normalize following the initiation of methimazole therapy

with a loading dose in patients with Graves' disease. **Methods:** A retrospective cohort analysis included 78 patients with Graves' disease who were treated with methimazole at an academic outpatient endocrinology practice in the United States. All patients began methimazole therapy with a loading dose tailored to the severity of their hyperthyroidism at diagnosis, ranging from 10 to 60 mg daily, followed by a taper to either daily or weekly methimazole dosing. Methimazole doses were initially titrated every few weeks and then every few months, based on laboratory results. Collected data included baseline thyroid function tests (TFT) and the time to normalization of TSH, free T4 (FT4), and total T3 (TT3). Normal TFT ranges were TSH 0.4-4.2 mCu/mL, FT4 0.6-1.5 ng/dL, and TT3 89-179 ng/dL. Descriptive and inferential statistical tests were utilized. Data with a normal distribution were presented as mean \pm standard deviation (SD). Non-normally distributed data were reported as the median [25th-75th percentiles], as determined by the Shapiro-Wilk test. **Results:** Most patients (70 out of 78) had undetectable TSH levels at diagnosis. The median initial FT4 was 2.6 ng/dL [1.7-3.9], and the median initial TT3 was 260.5 ng/dL [180.5-352.5]. The median times to normalization were 66.5 days for FT4 and 60.5 days for TT3. The median time to detectable TSH levels was 109 days, while the median time to TSH normalization was 176 days. **Conclusion:** Our findings indicate that TSH values take nearly six months to normalize with a loading dose, whereas FT4 and TT3 concentrations normalize much faster within a couple of months. In the future, it would be valuable to compare these outcomes to those of patients treated with lower initial methimazole doses.

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