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Methimazole Dosing And Titration Patterns In Graves' Disease: A Retrospective Longitudinal Cohort Study

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Introduction: Graves' Disease is the most common etiology of thyrotoxicosis, and its management remains a therapeutic challenge with clinical implications for cardiovascular health and quality of life. In the United States, methimazole is established as first-line pharmacological treatment, but heterogeneity exists in dosing strategy. Initial dosing regimens typically range from 10-40 mg

daily, with subsequent adjustments based primarily on laboratory parameters, physician judgment, and patient agreement. There is limited data on whether dose titration should also be influenced by initial severity of presentation. **Objective:** To identify if initial severity of thyrotoxicosis is associated with differences in methimazole titration to achieve and maintain clinical euthyroid status. **Methods:** Adult patients diagnosed with Graves' disease visiting an outpatient metropolitan thyroid referral center were identified retrospectively and specific data from each visit were collected and reviewed. Data collected included patient age, gender, ethnicity, current methimazole dose, new dose if changed, days of therapy, and clinical thyroid status. Clinical thyroid status was identified based on an ordinal scale using serum thyroid stimulating hormone (TSH) concentration, serum free thyroxine (FT4), and serum total triiodothyronine (TT3). **Results:** 1432 total encounters were identified involving 152 unique patients from May 2018 to April 2024. There was a significant difference in median interval time between visits between groups (mild: 64.0 d, moderate: 38.0 d, severe: 38.5; $p<0.01$); in methimazole dose between groups (mild: 2.5-8.6 mg daily, moderate: 5-20 mg daily, severe: 10-20 mg daily; $p<0.01$); and the percent reduction of methimazole dose during treatment period (mild 0-30%, moderate: 0-42%, severe: 25-50%; $p< 0.01$). **Conclusion:** Greater severity of thyrotoxicosis was associated with a higher initial dose of methimazole, faster taper in methimazole dose, and more frequent visits.

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