The reliability of thyroid function tests is critical for assessing thyroid status and guiding treatment decisions. However, the accuracy and precision of thyroid hormone assays can vary significantly, affecting patient care and outcomes. The Centers for Disease Control and Prevention (CDC) has developed a reference measurement procedure (RMP) for free thyroxine (FT4) to improve the accuracy and comparability of FT4 assays across laboratories.

**Methods:** We conducted semi-structured interviews with 96 patients at baseline and 1 year to discuss their thyroid-related symptom burden. Patients utilized prompt cards to identify and rank the severity of their thyroid-related symptoms (3 being most bothersome and 0 being no effect at all). Individual symptom scores were added to calculate a Cumulative Symptom Score (CSS). Patients also completed the validated Short Form-12 (SF-12) questionnaire for mental and physical health (scored from 0-100; higher score attributing to better health) and ThyCa-QoL questionnaire (scored from 0-100; higher score attributing to more complaints) at these 2 time-points.

**Results:** Of the 96 patients with available CSS data, there were 37 patients in the Hashimoto’s group (97% had biopsy proven thyroiditis and 24% were on thyroid hormone at baseline) and 59 patients in the control group. At baseline, Hashimoto’s patients had a higher CSS than the control group (9.94 vs. 7.13, p=0.05). Overall, mean CSS, in both groups, declined from baseline to 1 year (7.74 to 6.08, p=0.04), and over half of the individual patients, had a decline in their CSS at 1 year (56% in Hashimoto’s and 54% in control). Although, the Hashimoto’s group started higher at their baseline, they also had a slightly larger decline in CSS at 1 year than the control patients (-2.2, p=0.11 vs. -1.2, p=0.19). On the SF-12, Hashimoto’s patients had a significant improvement in their mental health (+6.0 pts, CI 1.8-10.2, p value = 0.007) whereas the control patients did not (+2.4 pts, CI 0.3-5.2, p=0.08). On the ThyCa-QoL, Hashimoto’s patients had worse scores at baseline as compared to the control patients (20.8 vs 16.7, p=0.11) and there was a slight but clinically significant improvement from baseline to 1 year (decrease in mean of 1.18 pts, p=0.5). Analysis of the qualitative data showed that of the 10 patients who were on thyroid hormone pre-operatively, 9 described significant symptom improvement at 1 year, with fatigue being the major symptom that was reported as improved.

**Conclusion:** Based on the data above, we see that patients with Hashimoto’s do have a higher symptom burden at baseline and thyroidectomy may play a role in symptom alleviation as well as improving mental health and QoL. Our data supports recent findings that thyroidectomy may play a role in alleviating thyroid related symptoms in this patient population and further investigation to better understand this phenomenon is warranted.

**Thyroid FROM HYPO- TO HYPERTHYROIDISM**

**CDC Clinical Standardization Programs (CSP) for Free Thyroxine (FT4) to Improve the Accuracy and Reliability of FT4 Measurements in Patient Care and Clinical Research**

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**Thyroid FROM HYPO- TO HYPERTHYROIDISM**

**Clinical Implication of TSH Screening in Venous Thromboembolism Patients**

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Background: Venous thromboembolism (VTE) that have significant morbidity and mortality for patients in the community and hospital. A recent meta-analysis found a significantly increased risk of incidence VTE among patients with hyperthyroidism compared to patients without hyperthyroidism. To our knowledge, no study has attempted to explore whether screening for TSH levels in VTE patients leads to a diagnosis of undiagnosed thyroid dysfunction as VTE could be the first presenting symptom.

Method: We conducted a retrospective cohort study and analyzed data of all patients treated at University Medical Center, Lubbock, Texas in 18-85 years of age with a diagnosis of DVT and/or PE in 2019. Qualitative chart review to identify cases of clinically significant TSH screening in VTE patients that leads to thyroid dysfunction diagnosis. Associations between variables tested using Student's t-test, chi-square, and Fisher's exact test. Results: Of total of 533 participants with diagnosis of VTE in 2019, 85 participants were included in the study. Seven participants (8.24%) were found to have high TSH level (>4.2 mIU/mL). None of them was found to have low level of TSH. Participants in high TSH group were more likely to be female (71.43%) and Caucasian (71.43%). In high TSH group patients tended to have both PE and DVT diagnosis at the same admission (71.43%). Weight and BMI were higher than those with normal TSH level. Segna et al conducted a prospective multicenter cohort study on association between thyroid dysfunction and venous thromboembolism. The study measure thyroid hormones and thrombophilic biomarkers at 1 year after the acute VTE and follow for the recurrent VTE (rVTE). They found that after 20.8 months of follow-up, 9% developed rVTE. However, none of them was found in subclinical hyperthyroidism group. Furthermore, in their multi-variate analyses, the hazard ratio for rVTE was 0.80 (95%CI 0.23-2.81) subclinical hyperthyroidism compared with euthyroid participants. They concluded that subclinical hyperthyroidism may be associated with lower rVTE risks. Similarly, with Liviu study found hyperthyroidism was not associated with an increased risk of VTE. Qualitative chart review in our patients with high TSH resulted that none of them had history of tobacco use. One participant was on birth control pills with the history of cervical carcinoma. Conclusion: The association of thyroid dysfunction and the development of VTE is debated on the literature review. In our study we found multiple patients with high TSH level (8.24%) in VTE patients with no prior history of thyroid dysfunction. TSH could play an important role in hypercoagulable state. Subclinical hypothyroidism and/or hypothyroidism may induce a prothrombotic event. For many patients, daily and lifelong therapy is required, and compliance/adherence then becomes a major issue. In such cases, weekly replacement may be a suitable alternative in terms of improving patient compliance. In this study, we aimed to determine the efficacy and safety of weekly versus daily levothyroxine replacement in patients with hypothyroidism.

Methods: Electronic databases were searched, supplemented with manual searches. Two reviewers independently screened the abstracts, reviewed full-text papers, independently critically appraised the quality of included studies and abstracted the data. A meta-analysis was performed using the random-effects model on randomized controlled trials (RCTs) that reported standard doses of daily versus weekly levothyroxine administration in the treatment of hypothyroidism. The primary outcome is the difference in serum TSH levels between daily versus weekly levothyroxine administration, while secondary outcomes included clinical symptoms and adverse events using the hypothyroidism symptom scale.

Results: The study included two randomized trials (N = 109) in the primary analysis. The difference in TSH levels was 1.78 mIU/mL higher (95% CI: 1.28, 2.28; P < 0.0001) at 6 weeks and 1.22 mIU/mL higher (95% CI: 0.76,1.67; P < 0.0001) at 12 weeks for the weekly replacement regimen, respectively. There was no significant heterogeneity noted between the two groups. There was no significant difference in terms hyperthyroid symptoms and adverse events measured by the hypothyroid symptom scales and echocardiographic parameters, respectively, before and after LT4 within each group.

Conclusions: Our results showed that weekly LT4 administration has less suppression of TSH levels, while still remaining within the reference range of normal. It may be an alternative for patients especially in setting of non-compliance. However, more randomized trials with larger sample sizes and a longer duration of follow-up are needed to firmly establish the definite role of weekly LT4.