Han R et al. Diagnosing Thyrotropin-Secreting Pituitary Adenomas by Short-Term Somatostatin Analogue Test. Thyroid. 2020;30(9):1236-1244. doi: 10.1089/thy.2019.0470.

Background: Diagnosis of thyrotropin (TSH)-secreting pituitary adenomas (TSHoma) before surgery remains a challenge, especially for microadenomas. We aimed to establish a short-term somatostatin analogue (SSA) test to differentiate TSHomas from other causes of syndromes of inappropriate secretion of TSH (IST), mainly resistance to thyroid hormone β (RTHβ).

Materials and Methods: We first evaluated the sensitivity and specificity of SSA test in a training cohort (TSHoma, n = 32; RTHβ, n = 20). The test was then validated in an independent cohort (TSHoma, n = 9; RTHβ, n = 2). We finally applied the SSA test in 12 perceptively enrolled IST cases with negative imaging findings and absent thyroid hormone receptor beta (THRB) mutations or mixed hormone imbalances.

Results: Both TSHoma and RTHβ patients showed a decrease of TSH at the start of the SSA test, but the velocity of the TSH suppression slowly decreased in RTHβ patients after 2 hours. The suppression ratio of TSH at 24 hours versus 2 and 0 hours was significantly greater in TSHoma patients compared with RTHβ patients (70.58% ± 18.6% vs. 6.01% ± 25.41%, $p < 0.0001$, 79.83% ± 12.79% vs. 51.16% ± 13.62%, $p < 0.0001$, respectively). The 24- versus 2-hour suppression ratio showed the best diagnostic accuracy at a cut point of 44.46% in the training cohort, with a sensitivity of 95.00%, a specificity of 93.75%, and a positive predictive value (PPV) of 88.89%. The accuracy was confirmed in the validation cohort. Three out of 12 patients in the prospective cohort showed a TSH suppression ratio greater than 44.46% and all developed microadenomas during follow-up.

Conclusions: A short-term SSA test provides an alternative diagnostic approach for TSHomas. A positive SSA test result is suggestive for a TSHoma even before positive findings become apparent on pituitary imaging. However, studies including larger number of patients, especially those with RTHβ, are needed to confirm our findings.