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Laboratory Medicine Bulletin

Change in Thyroglobulin and Anti-Thyroglobulin Methods

July 25, 2016

As of July 26, 2016, St. Paul's Hospital has changed its method for thyroglobulin (Tg) and anti-thyroglobulin (ATg) measurement from Siemens Immulite 2000 XPi to Roche Cobas e601.

Thyroglobulin: New Lower Reportable Limit of 0.1 µg/L

The new Roche method for Tg is more sensitive than the old one and accordingly the lower reportable limit will now be 0.1 µg/L instead of the prior value of 1 µg/L. This facilitates the application of recommendations of American Thyroid Association for patients with differentiated thyroid carcinoma [1] wherein unstimulated Tg < 0.2 µg/L and TSH-stimulated Tg results < 1 µg/L are considered evidence of excellent response to therapy in patients with undetectable ATg.

Overall, the new Tg method compares well to the old method in patients with undetectable ATg levels but may not compare well in certain individuals, particularly those who had positive ATg by the former Siemens method. Given the well-known challenges with Tg determination [2], establishment of a new baseline Tg is recommended. Of note, all laboratories in British Columbia reporting Tg and ATg are now using the Roche method.

Anti-Thyroglobulin: Expect Changes in Antibody Titre.

As previously reported [3], we have found the numerical comparability of antibody titres between the new Roche ATg method and the old Siemens ATg method to be poor. It should also be noted that the probability of finding patients low-level positive ATg is higher with the new method. While rising ATg titre is considered as evidence of occult disease recurrence [1], this is only reliably true if ATg has always been measured by the same method. *Therefore, numerical changes in antibody titre noted in the transition between these two ATg methods should **not** be assumed as surrogate evidence of disease-recurrence.*

As ATg is well-known to interfere with the determination of Tg (causing spurious decreases), rather than tracking ATg titres as a surrogate, Tg determination by liquid chromatography and tandem mass spectrometry is preferred for ATg positive patients since mass spectrometry is not affected by the presence of ATg [4]. This can be arranged by request.

While the clinical use of Tg and ATg is almost entirely limited to thyroid cancer monitoring, there are reference intervals for normal patients which have changed from the previous method. These follow.

AGE	New Tg Reference Interval (µg/L)
0 – < 6 d	25.0 – 307.0
6 d – < 120 d	20.0 – 228.0
120 d – < 1 y	18.0 – 125.0
1 y – < 7 y	9.0 – 67.0
7 y – < 19 y	3.0 – 43.0
≥ 19 y	1.4 – 78.0

AGE	New ATg Reference Interval (kIU/L)
0 – < 1 y	<140
1 – < 12y	<40
12 – < 19 y	<65
≥ 19 y	<115

Clinical management questions arising from this method transition are both expected and encouraged. Please do not hesitate to contact either Dr. Daniel Holmes at 604 806 8919 or Dr. Andre Mattman at 604 806 8190 if you need interpretive assistance for your Tg or ATg result.

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REFERENCES

[1] Haugen et al. 2015 American Thyroid Association management guidelines for adult patients with thyroid nodules and differentiated thyroid cancer. Thyroid. 2016 ;26:1-33.
[2] Spencer C et al. Thyroglobulin antibody (TgAb) methods–Strengths, pitfalls and clinical utility for monitoring TgAb-positive patients with differentiated thyroid cancer. Best Pract Res Clin Endocrinol Metab. 2013;27:701-12.
[3] Spencer et al. Current thyroglobulin autoantibody (TgAb) assays often fail to detect interfering TgAb that can result in the reporting of falsely low/undetectable serum Tg IMA values for patients with differentiated thyroid cancer. JCEM. 2011;96:1283-91.
[4] Hoofnagle et al. Improving the measurement of serum thyroglobulin with mass spectrometry. JCEM. 2013;98:1343-52.