

Thyroid Peroxidase Antibodies (Anti-TPO)

WHAT ARE THYROID PEROXIDASE ANTIBODIES?

Thyroid peroxidase is a protein produced from cells in the thyroid gland, an endocrine gland in the lower front of the neck. Thyroid peroxidase antibodies (anti-TPO) occur when the body's own immune system attacks the thyroid and targets thyroid peroxidase. Antibodies to thyroglobulin (anti-Tg) also occur in autoimmune disorders targeting the thyroid gland (1).

ELEVATED ANTI-TPO

Normal serum levels of anti-TPO are less than 5.61 IU/mL (2). Elevated anti-TPO are found in conjunction with anti-Tg in most cases of Hashimoto's thyroiditis (autoimmune disorder causing hypothyroidism) and Graves' disease (autoimmune disorder causing hyperthyroidism) (3). It is common to find anti-TPO in the absence of anti-Tg, as up to 64% of cases of autoimmune hypothyroidism are reported to be associated with anti-TPO alone (4).

Elevated anti-TPO are also frequently associated with other autoimmune disorders, including rheumatoid arthritis, Addison's disease, and type I diabetes (5,6).

HASHIMOTO'S THYROIDITIS

Hashimoto's thyroiditis is the most common cause of hypothyroidism. It is an autoimmune disorder that results in chronic inflammation of the thyroid, inhibiting the normal function of the thyroid, which results in low thyroid hormone production. Hashimoto's thyroiditis usually progresses slowly over many years (7). The symptoms can include fatigue, puffy eyes and face, dry hair and skin, constipation, slower heart rate, constantly feeling cold, confusion, and depression (1,8).

Treatment options for hypothyroidism include daily medications (e.g. levothyroxine), natural thyroxine hormone extracts, and reduced consumption of substances that affect levothyroxine absorption (e.g. fiber, soy, iron) (9).

GRAVES' DISEASE

Graves' disease is the most common cause of hyperthyroidism, affecting about 1 in 200 people in the United States. It is an autoimmune disorder that causes the thyroid to produce more hormones than normal. It usually affects people between 30 and 50 years of age, with rates seven to eight times higher in females than males. The symptoms can include a fast heart rate, high blood pressure, excess sweating, shaky hands, anxiety, and weight loss. In older people, the signs may be less obvious, with symptoms that include weakness, confusion, and depression (10).

Medication, radioactive iodine, or surgical removal of the thyroid gland are effective treatments for hyperthyroidism (9).

TEST PROCEDURE

Correct specimen collection and handling is required for optimal assay performance.

This test requires a blood sample from a finger prick. All supplies for sample collection are provided in this kit. First wash and dry hands. Warm hands aid in blood collection. Clean the finger prick site with the alcohol swab and allow to air dry. Use the provided lancet to puncture the skin in one quick, continuous and deliberate stroke. Wipe away the first drop of blood (as it may be contaminated with tissue fluid or skin debris). Massage finger to increase blood flow at the puncture site and hold in a position that gravity facilitates the collection of blood on

the fingertip. Transfer the blood to the blood collection card or blood collection tube (microtainer).

Avoid squeezing or 'milking' the finger excessively. If blood flow stops, perform a second skin puncture on another finger, if more blood is required.

Dispose of all sharps safely and return sample to the laboratory in the provided prepaid return shipping envelope.

Upon receipt at the laboratory, the blood sample is analyzed by the fully automated Alinity i Anti-TPO chemiluminescent microparticle immunoassay on the Alinity ci series analyzer. This assay measures anti-TPO levels by binding to TPO coated microparticles. The amount of anti-TPO in the blood sample is measured in relative light units by a chemiluminescent reaction.

TEST INTERPRETATION

This assay will provide accurate anti-TPO values for the tested specimen. This value is to be used in conjunction with other clinical and laboratory information for analyses of thyroid function.

DISCLAIMERS/LIMITATIONS

These results should be interpreted in conjunction with other laboratory and clinical information.

Additional testing is recommended if anti-TPO results are inconsistent with clinical evidence.

Interferences from medication or endogenous substances may affect results.

The presence of anti-TPO autoantibodies does not confirm autoimmune thyroid disease or abnormal thyroid function.

Correct specimen collection and handling is required for optimal assay performance. The assay is unaffected (< 4% interference) by hemoglobin (1000 mg/dL), bilirubin (20 mg/dL), triglycerides (1000 mg/dL), and protein (10 g/dL).

REFERENCES

- (1) Hershnan JM. (2019, August). *Overview of the Thyroid Gland*. Merck Manual Consumer Version:
- (2) Alinity i Anti-TPO Reagent Kit. [Package Insert]. s.l. : Abbott GmbH & Co, 2018.
- (3) Rosenbaum D, Davies TF. (1992). The clinical use of thyroid autoantibodies. *The Endocrinologist*. 2 (1), 55-62.
- (4) Nordyke RA, et al. (1993). The superiority of antimicrosomal over antithyroglobulin antibodies for detecting Hashimoto's thyroiditis. *Arch Intern Med*. 153, 862-865.
- (5) Chang C-C, Huang C-N, Chuang L-M. (1998). Autoantibodies to thyroid peroxidase in patients with type I diabetes in Taiwan. *Eur J Endocrinol*. 139, 44-48.
- (6) Walker DJ, Griffiths M, Griffiths ID. (1986). Occurrence of autoimmune diseases and autoantibodies in multicase rheumatoid arthritis families. *Ann Rheum Dis*. 45, 323-326.
- (7) Hashimoto's Thyroiditis (Lymphocytic Thyroiditis). American Thyroid Association.
- (8) Verma I, et al. (2012). Prevalence of hypothyroidism in infertile women and evaluation of response of treatment for hypothyroidism

on infertility. *Int J Basic Med Res*, 2 (1), 17-19.

- (9) Rugge JB, Bougatsos C, & Chou R. (2014) Screening for and Treatment of Thyroid Dysfunction: An Evidence Review for the U.S. Preventive Services Task Force [Internet]. *In Evidence Syntheses, No. 118*. Rockville, MD: Agency for Healthcare Research and Quality (US).
- (10) Graves' Disease. (2017). *National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK)*.