

Urticaria-Inducing Activity

Urticaria (hives) typically indicates an immune reaction to an allergen, such as foods, plants, or medications. Urticaria may also appear as a response to physical or emotional stress. The severity of the immune reaction varies, and urticaria is considered chronic if welts remain for longer than 6 weeks and recur often over weeks or months. Identifying the cause of recurrent urticaria may be difficult. Testing helps detect basophil-activating factors by inducing histamine release and CD203c upregulation in serum samples from individuals with suspected chronic urticaria.

Typical Testing Strategy

Initial testing should rule out more common etiologies for urticaria:

- Complete blood count with eosinophil count
- Examination of stool for ova and parasites if appropriate travel history is present
- Vasculitis evaluation:
 - Antinuclear antibody (ANA), rheumatoid arthritis (RA)
 - Erythrocyte sedimentation rate (ESR) or C-reactive protein (CRP)
 - Skin biopsy may be necessary
- Cryoglobulinemia evaluation:
 - Hepatitis B and C testing
 - Serum cryoglobulin
 - Complement assays: C3, C4, C1-esterase

If initial testing is negative, proceed with:

- Chronic urticaria index testing
- TSH with autoimmune thyroid testing

Disease Overview

Prevalence

20% in general population

- Common and complex dermatological condition

Symptoms

- Defined as hives lasting for >6 weeks
 - Wheal usually lasts for <24 hours
 - Pruritus may be intense
- Pigmentary changes if lesions last longer
- Associated with autoimmune thyroid disease (particularly Hashimoto thyroiditis)

Pathophysiology

- Basophil activation results in:
 - Release of histamine
 - Upregulation of CD203c, a human basophil-specific lineage marker
- Pathogenesis of the disease is poorly understood:
 - No evidence for exogenous allergen as cause
 - IgG autoantibodies directed against basophil- or mast cell-associated autoantibodies cause disease in many individuals
 - High-affinity IgE-Fc receptor1: ~40%
 - IgE: ~5%
 - Unknown etiology in remaining

Tests to Consider

Urticaria-Inducing Activity 2005413

Method: Semi-Quantitative Ex Vivo Challenge/Cell Culture/Quantitative Enzyme-Linked Immunosorbent Assay

Determine histamine release in suspected chronic urticaria if urticaria may be due to autoimmune antibodies to the basophil IgE receptor or to IgE

Urticaria-Induced Basophil Activation 2005416

Method: Semi-Quantitative Flow Cytometry

Determine whether CD203c is upregulated in suspected chronic urticaria if urticaria may be due to autoimmune antibodies to the basophil IgE receptor or to IgE

Urticaria-Inducing Activity with Thyroid Antibodies and Stimulating Hormone 2005415

Method: Semi-Quantitative Ex Vivo Challenge/Cell Culture/Quantitative Enzyme-Linked Immunosorbent Assay/Quantitative Chemiluminescent Immunoassay

Screen for possible thyroid autoimmunity in individuals with suspected chronic urticaria

Test Interpretation

Results

- Positive: possible presence of basophil stimulating autoantibodies (or other serum factors)
 - Suggests autoimmune basis for urticaria
- Negative: no basophil stimulating autoantibodies detected
- Indeterminate: borderline basophil activation detected
 - May have autoimmune basis for urticaria

Limitations

- Validated for serum only
- Does not identify specific basophil-stimulating serum factors
 - Factors are most likely antibodies that target the high-affinity IgE-Fc receptor or IgE

ARUP Laboratories is a nonprofit enterprise of the University of Utah and its Department of Pathology, 500 Chipeta Way, Salt Lake City, UT 84108
(800) 522-2787 | (801) 583-2787 | aruplab.com | arupconsult.com
Content Review November 2019 | Last Update July 2021