ANTIBODIES AND AUTOANTIBODIES

Antibodies In Health VS Autoantibodies in Disease

© Elaine Moore

A healthy immune system produces many different antibodies. However, when the immune system errs and reacts with the body's proteins, it produces autoantibodies.

**Antibodies**

Antibodies are proteins produced by the immune system from the body’s stores of immunoglobulin protein. The healthy normal immune system produces antibodies in an effort to protect us. The immune system cells produce antibodies when they react with foreign protein antigens, such as infectious organisms, toxins and pollen. At any given time, the body has a large surplus of antibodies, including specific antibodies that target thousands of different antigens. High antibody levels are a sign of a healthy, normal-functioning immune system.

**Immunity**

Antibodies protect us from disease. When we’re exposed to infectious organisms, for instance the hepatitis A virus (HAV), and develop HAV infection, our immune systems produces antibodies that target and react with HAV. These HAV antibodies cause lifelong protection from our developing hepatitis A again upon subsequent exposures to the hepatitis A virus.

Immunologically speaking, hepatitis A antibodies (HAV Ab) thereby cause immunity or protection from our developing hepatitis A again. Consequently, people who have once had hepatitis A have lifelong immunity to hepatitis A.

**Active and Passive Antibodies**

Vaccines contain treated concentrations of infectious agents. The treatment, usually heat or chemical inactivation, renders the organism impotent or incapable of causing infection. However, the treated substance tricks our immune system into reacting and actively producing antibodies against the infectious organism. For instance, vaccines for polio cause us to produce polio antibodies. These antibodies, which are actively produced by our immune systems, protect us from developing polio upon contact with the polio virus.

Passive antibodies are concentrated antibodies given in certain vaccines. Passive vaccines are given in cases in which there is not time for our immune system to produce antibodies after exposure. For instance hepatitis B immune globulin or HBIG is a passive vaccine that contains antibodies to the hepatitis B virus. HBIG is given immediately after unvaccinated individuals, for instance newborns during childbirth, are exposed to
hepatitis B. Passive antibodies last about 3 months. Thus, they protect us from disease until our immune system has time to react to the usual active vaccines.

**IgA, IgM, and IgG Antibodies**

There are 5 classes of immunoglobulin protein: immunoglobulin A (IgA), immunoglobulin G (IgG), immunoglobulin D (IgD), immunoglobulin M (IgM), and immunoglobulin E (IgE). Normally, our body contains ample amounts of each of these immunoglobulins, which are available for our body's needs for antibody production.

Upon exposure to infectious organisms or vaccines, our immune systems quickly produce IgM and IgA antibodies, which are the earliest antibodies seen after infection or vaccination. Within weeks, our immune systems begin to produce IgG antibodies. IgA and IgM antibodies are short acting and break down within a few weeks to months. IgG antibodies are long lasting, in most cases lasting for life.

In testing for infection or in diagnosing autoimmune conditions, tests for both IgM and IgG antibodies are often used. For instance, in suspected celiac disease, patients are tested for IgM and IgA gliadin antibodies. IgE antibodies develop during allergic responses and parasitic infections. Levels of IgE antibodies to specific allergens are used to diagnose allergic conditions. Because allergies stimulate the immune response, high levels of IgE tend to worsen or exacerbate symptoms in people who have autoimmune disorders. For instance, in patients with Graves' disease, higher levels of IgE are seen in people who have the worst symptoms or the most severe cases.

**Immunoglobulin Deficiencies**

In people with hereditary conditions causing low levels of specific immunoglobulins, the immune system will not be effective in fighting disease. Various immunoglobulin levels are measured to help diagnose these immune deficiency conditions.

**Autoantibodies**

When the immune system is weak and ineffective, it reacts inappropriately. When the immune system erroneously reacts to the protein components of our body’s own tissues and cells, it produces autoantibodies. Autoantibodies that persist contribute to autoimmune disease development. Specific autoantibodies occur in specific autoimmune diseases. For instances, thyroid autoantibodies are seen in individuals with autoimmune thyroid disease.

**Autoantibodies as Markers of Disease**

Certain antibodies, such as the anti-nuclear antibodies (ANA), which include a number of different subtypes, are seen in many different autoimmune disorders. ANA can also be seen in low titers in people free of disease who show evidence of autoimmunity but no signs of disease.
In diagnosing infectious diseases, such as hepatitis, hepatitis antibodies show evidence of either past or current infection or prior vaccination, if vaccines are available. In people with clinical signs and symptoms of autoimmune disease, tests for autoantibodies are used to help diagnose specific conditions. People with symptoms of lupus, for example, who have a positive ANA test are required to have other more specific tests to help diagnose their condition.

The pattern seen in the ANA test result suggests what possible antibodies are present. In systemic lupus, tests for double-stranded (ds) DNA antibodies are positive, and are useful in differentiating systemic lupus from other connective tissue disorders.

**Resources:**


James B Peter, Use and Interpretation of Tests in Rheumatology, Los Angeles, Specialty Laboratories, 1996.

The copyright of the article Antibodies and Autoantibodies in Autoimmune Disease is owned by Elaine Moore. Permission to republish Antibodies and Autoantibodies in print or online must be granted by the author in writing.