ANA PATTERNS

Diagnosing Lupus and Related Connective Tissue Disorders

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Specific patterns seen on the ANA test can be used to determine the specific antinuclear antibody that's present, which, in turn, can help diagnose the specific autoimmune condition that's present.

Usefulness of the ANA Test

Antinuclear antibodies (ANA), which occur in a number of different autoimmune disorders including systemic lupus erythematosus (SLE) and Sjogren's syndrome, target specific protein antigens present in the body's nucleated cells. The preferred method of testing for ANA is the immunofluorescent (IFA) technique, which is considered the gold standard. Alternative methods such as the enzyme linked ELISA method are more likely to cause false positive results. Another benefit of the IFA ANA test is that the ANA detected in the IFA results yield distinctive staining patterns in the nucleus or cytoplasm of the reagent cells used to perform the test. These staining patterns offer specific clues as to which particular antinuclear antibody or antibodies may be present.

The specific autoantibody that's present, in turn, gives the physician information as to what autoimmune disease may be present or what other specific autoantibody tests need to be performed. In some cases, more than one autoimmune disease (overlap syndromes) may be present, which causes more than one ANA pattern to be present in a sample.

Test Patterns

Some patterns are more specific for particular diseases than others. For example, in SLE, a homogeneous pattern is present, whereas a nucleolar pattern is seen in scleroderma and a centromere pattern in the CREST variant of scleroderma. The type of pattern determines what antibodies might be present. For instance, in a homogeneous pattern, anti-DNA antibodies are possible and this test would be recommended, whereas it would not be recommended in patients who have a speckled pattern ANA. The most common secondary antibody tests performed based on ANA results include: anti-DNA, anti-Sm, anti-RNP, SS-A and SS-B.

The homogeneous/rim ANA pattern can be caused by: antibodies to double and single-stranded DNA (seen in SLE in high titers and in lower titers in other rheumatic diseases); and antibodies to histones (seen in drug-induced lupus), and deoxynucleoprotein (seen in SLE). A speckled pattern can be caused by the following antibodies: Smith (Sm), which is diagnostic of SLE; nuclear RNP, which is seen in high titers in mixed connective tissue
disease (MCTD) and SLE; SS-A (Ro), which is seen in Sjogren's syndrome and SLE; and SS-B (La), which is seen in Sjogren's syndrome.

The centromere pattern of ANA is seen in the CREST variant of scleroderma, which will be described in an upcoming article. A nucleolar pattern is caused by the following antibodies/antigens: RNA polymerase I, which is highly prevalent in scleroderma; fibrillarin and also DNA topoisomerase I (Scl-70), which are both seen in scleroderma; and PM-scL, which is seen in polymyositis.

An MSA pattern is caused by antibodies to mitotic spindle apparatus and NuMa; these antibodies can be seen in carpal tunnel syndrome, SLE, and Sjogren's syndrome; the cytoplasmic nucleolus pattern is seen in polymyositis.

**Interpreting Results**

While these patterns offer excellent diagnostic clues for autoimmune diseases, antinuclear antibodies may be negative during periods of low disease activity or remission. Because titers of these antibodies tend to rise during flares of disease activity, specific antibody tests as well as ANA titers can be used to measure the response to treatment and disease prognosis.

Resources: Marc Golightly and Candace Golightly, Laboratory Diagnosis of Autoimmune Disease, Medical Laboratory Observer, July 2002.


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