ARUP LABORATORIES

F-Actin (Smooth Muscle) IgG by Enzyme Immunoassay

SCREENING FOR AUTOIMMUNE LIVER DISEASE AND CHRONIC ACTIVE HEPATITIS

Test Highlights

- This test uses enzyme immunoassay (EIA) for the detection of IgG antibodies against F-actin (smooth muscle) to aid in the diagnosis of autoimmune liver disease and chronic active hepatitis.
- F-actin by EIA is beneficial because it is more specific for diagnosing autoimmune liver disease and chronic active hepatitis than the traditional anti-smooth muscle antibodies (SMA) by indirect fluorescent antibody (IFA) test.

Clinical Background

- Antibodies against smooth muscle (SMA) and nuclear antigens (ANA) are the serological hallmarks of autoimmune hepatitis type I, the most common type of the autoimmune liver diseases.
- Between 52-85 percent of patients with chronic active hepatitis and approximately 22 percent of patients with primary biliary cirrhosis, two types of liver disease, have antibodies directed against the actin component of the cytoskeleton. Traditionally, when diagnosing liver diseases, SMA is detected by indirect fluorescent antibody (IFA). However, recent studies suggest that anti-actin antibodies by EIA are better markers than SMA by IFA. In addition, anti-actin antibodies are thought to be more specific for autoimmune liver diseases.
- An ARUP in-house study suggested a significant increase in sensitivity for the F-actin EIA compared to SMA by IFA:
  - F-actin is 100 percent sensitive when compared to SMA IFA in patient sera with clinically significant SMA titers of greater than or equal to 1:160. Only one in 100 of the normal control sera demonstrated reactivity to F-actin and this one sera had a very low antibody content (20-30 units).
  - Approximately 40 percent of the antibody positive control sera for viral hepatitis demonstrated clinically insignificant ($\leq$ 1:80) SMA titers. Studies have shown SMA in patients with viral hepatitis and other infectious diseases to be directed against non-actin cytoplasmic antigens.
  - Approximately 15 percent of the viral antibody positive control sera were reactive against F-actin and the majority (62.5 percent) of these sera were of very low antibody content. Approximately 13 percent of patient sera having negative or clinically insignificant SMA IFA titers possessed moderate to high levels of antibody against F-actin, 54.8 percent of which were also ANA positive.
- Patients with autoimmune liver disease who test positive for actin antibody are more likely to be unresponsive to corticosteroid therapy and have a higher rate of liver failure.

Indications for Use

Testing for F-actin IgG is appropriate for patients suspected of having autoimmune liver disease or chronic active hepatitis.

Interpretation

- F-actin IgG values of 31 Units or greater are suggestive of autoimmune liver disease or chronic active hepatitis.
- A negative result does not rule out autoimmune liver disease nor chronic active hepatitis, since not all patients are actin antibody positive.
- The F-actin EIA replaces the smooth muscle IFA (test number 0050738) for initial screening. However, Factin positive sera reflex to a smooth muscle IFA titer and both results are then reported.

Limitations

Test results alone are not diagnostic and should be used in conjunction with other clinical findings to make a diagnosis of autoimmune liver disease or chronic active hepatitis.

Methodology

- F-actin IgG is performed by enzyme immunoassay (EIA) using purified F-actin antigen.
- Smooth muscle titer is performed by indirect fluorescent antibody (IFA) on reflex after a serum is found to be F-actin positive.

References

1. Alvarez F, et al. International autoimmune hepatitis group report: review of criteria for diagnosis of autoimmune hepatitis. J of Hepatology 1999; 31:929-938.
2. George J and Shoenfeld Y. Actin Autoantibodies. In *Autoantibodies*, 1996, Peter JB and Shoenfeld Y, eds. Elsevier: Amsterdam, pages 10-12.
3. Fusconi M, et al. Anti-actin antibodies: a new test for an old problem? J Immunol Methods 1990; 30:1-8.
4. Czaja A, et al. Frequency and significance of antibodies to actin in type I autoimmune hepatitis. Hepatology 1996; 24:1068-1073.

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Test Information

0055248 F-Actin (Smooth Muscle) Antibody, IgG

For specific collection, transport, and testing information, refer to the ARUP Web site at www.aruplab.com.