Liver Cytosolic Antigen Type 1 (LC-1) Antibody

Indications for Ordering

• Differential evaluation of autoimmune liver disease (ALD) of unknown etiology, especially autoimmune hepatitis (AIH) of childhood onset
• Consider
  o If other serologic tests in ALD panel are negative, or
  o In combination with specific tests
    ▪ Anti-LKM1
    ▪ ANA
    ▪ F-actin
    ▪ SMA

Test Description

Liver Kidney Microsome-1 Antibody, IgG
• Semiquantitative enzyme-linked immunosorbent assay (ELISA)
Liver Cytosolic Antigen Type 1 (LC-1) Antibody, IgG
• Qualitative immunoblot

Tests to Consider

Primary tests
Liver Kidney Microsome-1 Antibody, IgG 0055241
• Use in combination with Liver Cytosolic Antigen Type 1 (LC-1) Antibody, IgG
• More likely to be positive than LC-1
Liver Cytosolic Antigen Type 1 (LC-1) Antibody, IgG 2010711
• Use in combination with Liver Kidney Microsome-1 Antibody, IgG

Related tests
Autoimmune Liver Disease Evaluation with Reflex to Smooth Muscle Antibody (SMA), IgG by IFA 2007210
• Recommended first-line panel for evaluation of ALD
  o Negative results do not rule out disease
ANCA-Associated Vasculitis Profile (ANCA/MPO/PR3) with Reflex to ANCA Titer 2006480
• Initial test in conjunction with Autoimmune Liver Disease Evaluation with Reflex to SMA, IgG by IFA for evaluation of ALD

Disease Overview

Incidence
AIH – 0.85-1.9/100,000 per year for white adults of northern European ancestry

Prevalence
• ALD
  o 5% of all liver diseases
• AIH type 1
  o Most common type of AIH
• AIH type 2
  o Rare – 4% of AIH individuals in the U.S.

Age
• AIH type 1 – bimodal peaks (10-30 years, 40-50 years)
• AIH type 2 – childhood

Physiology
AIH
• Etiology – antibodies directed against the liver
• Chronic course with slow progression – may resemble other chronic liver diseases (eg, alcoholic cirrhosis, chronic viral hepatitis)

Clinical presentation
• Clinical features vary widely, ~25% asymptomatic
  o Arthralgias
  o Anorexia, fatigue, lethargy, malaise
  o Hepatomegaly, nausea, upper abdominal pain, jaundice
    ▪ Progression to cirrhosis and liver failure possible
• Antibody-negative disease
  o Same presentation and histology as antibody-positive AIH

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Diagnostic/prognostic issues

- May be difficult to clinically distinguish between AIH types 1 and 2
- Important to distinguish AIH type 1 from type 2 (prognostically)
  - Higher risk of fulminant course and progression to cirrhosis in type 2
  - Cirrhosis often present in children at time of diagnosis
- Antibody testing may be helpful for diagnosis
  - Antibodies to liver-kidney microsome-1 (LKM1) and/or LC-1 are diagnostic for AIH type 2
    - LKM1 antibodies should be analyzed by measuring antibodies to cytochrome P4502D6
- Diagnosis of exclusion
  - No other etiology found for liver disease/cirrhosis – key to this diagnosis
- Liver biopsy may be appropriate in certain individuals
  - Should be performed when diagnosis is still unclear
  - Considered “gold standard”

Test Interpretation

Typical antibody pattern in AIH-1

- pANCA – atypical staining
- SMA, F-actin – positive
- ANA – homogeneous pattern most common
- LC-1 – negative
- SLA – variably positive, more common in children

Results

Typical antibody pattern in AIH-2

- pANCA – positive (rare) or negative
- LKM-1 – positive
- LC-1 – positive
- ANA, SMA, F-actin, M2, SLA – negative

Limitations

- Negative antibody testing does not rule out ALD
- All interpretation of antibody patterns must be done in conjunction with clinical presentation
  - Overlap may occur between diseases and antibodies
- Neither LKM-1 nor LC-1 has absolute diagnostic sensitivity for AIH type 2