Overview

Type I diabetes or insulin-dependent diabetes mellitus (IDDM) is an organ-specific autoimmune disease which results in pancreatic islet cell destruction.\(^1\) Evidence of cellular destruction includes autoantibodies to islet cells (ICA),\(^2\) antibodies to insulin (IAA),\(^3\) and glutamic acid decarboxylase autoantibodies (GAD Ab). ICA (as detected on thin frozen sections of human pancreas by indirect immunofluorescence) are present in 80% of newly diagnosed IDDM patients. ICA, GAD Ab and IAA are all helpful in screening first-degree relatives of patients with IDDM.\(^4\) C-peptide is also helpful in making the diagnosis of Type I diabetes. C-peptide is high-normal or elevated in Type 2 diabetes and low-normal or reduced in Type I diabetes.\(^5\)

ICA, GAD Ab and IAA do not appear all at once, but at random, varying rates depending on the patient.\(^6\) These antibodies also occur before the onset of IDDM, increasing their potential for early disease detection.\(^6\) Specifically, IAA is among the first to appear during the asymptomatic period which characterizes IDDM (lasting anywhere from years to decades), and is present in the majority of young children destined to develop the disease.\(^1\)

Clinical Utility

- **Diabetes Mellitus Autoantibody Panel** is useful to screen for those relatives of IDDM patients who may be at risk of developing Type I diabetes; 60-80% of first-degree relatives with both ICA and IAA will develop IDDM within 10 years.\(^7\)
- Predictive value for the development of Type I diabetes in first-degree relatives increases to 100% when the ICA is strong (>80 JDF U) and persistently positive.\(^8\)
- Measurement of GAD Ab is a useful adjunct to measuring ICA, as 43% of ICA-positive, first-degree relatives also have elevated GAD Ab.\(^3\)
- Children less than 14 years of age can be screened for Type I diabetes using ICA, IAA and GAD Ab; with 93% sensitivity and 93% specificity for any positives, and 39% sensitivity and >99% specificity, for all positives.\(^4\)
- Because of a strong association of IDDM with autoimmune thyroid disease (AITD), testing AITD patients for diabetes mellitus autoantibodies could be a useful means of predicting progression to Type I diabetes.\(^9\)

Ordering Information & Specimen Requirements

<table>
<thead>
<tr>
<th>Test Code</th>
<th>Test Name</th>
<th>Specimen Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>1032</td>
<td>Diabetes Mellitus Autoantibody Panel</td>
<td>3 mL Serum; Refrigerated or Frozen</td>
</tr>
<tr>
<td></td>
<td>- Islet Cell Complement Fixing Autoantibodies</td>
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<tr>
<td></td>
<td>- Islet Cell IgG Autoantibodies</td>
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<td></td>
<td>- Insulin Antibodies</td>
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<td></td>
<td>- Glutamic Acid Decarboxylase Autoantibodies</td>
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</tbody>
</table>

*Specify “Send Diabetes Mellitus Autoantibody Panel to Specialty Laboratories”*
Methodology

1032  Diabetes Mellitus Autoantibody Panel
  Glutamic Acid Decarboxylase (GAD) Autoantibodies, Radioimmunoassay (RIA)
  Insulin Antibodies, Radioimmunoassay, RIA
3066  Islet Cell Complement Fixing Autoantibodies, Indirect Fluorescent Antibody (IFA)
1165  Islet Cell IgG Autoantibodies, IFA

Related Tests

3140  C-Peptide
1033  Glutamic Acid Decarboxylase (GAD) Antibodies
3876  Insulin Antibodies
3069  Islet Cell Autoantibodies Evaluation
3066  Islet Cell Complement Fixing Autoantibodies
1165  Islet Cell IgG Cytoplasmic Autoantibodies

References


Be sure to visit our Web site at www.specialtylabs.com