Calprotectin, Fecal by Immunoassay

Inflammatory bowel disease (IBD) represents a spectrum of chronic disorders that affect the gastrointestinal (GI) tract. Crohn disease (CD) and ulcerative colitis (UC) are the major IBD disorders. Fecal calprotectin is a marker of gut inflammation with good sensitivity for detecting IBD. Fecal lactoferrin, an iron-binding protein, is another useful marker of intestinal inflammation in IBD, but more clinical evidence is available for fecal calprotectin.

Disease Overview

Prevalence

IBD: 286/100,000 in United States

Physiology

- Calprotectin is a calcium-binding protein and accounts for 60% of soluble protein in neutrophils
- Calprotectin concentration in feces is proportional to the level of inflammation in patients with UC; the relationship is more variable in patients with CD
- Calprotectin is stable in stool samples

Diagnostic Issues

- IBD symptoms may be vague and similar to those of irritable bowel syndrome (IBS) (eg, diarrhea, abdominal pain)
  - IBS is much more prevalent than IBD
- Differentiation of IBD from IBS may require invasive procedures
- Calprotectin testing may be useful as a screen for differentiating IBS and IBD, reducing the necessity of invasive procedures

Monitoring Issues

- Monitoring by endoscopy is invasive
- Calprotectin measurement can be used to help differentiate quiescent from active IBD
- Mucosal healing is associated with sustained remission and is the goal of IBD treatment
- Calprotectin levels correlate with endoscopic scoring systems that are used to assess mucosal healing and may be useful in evaluating mucosal healing

Featured ARUP Testing

Calprotectin, Fecal by Immunoassay 3002859

Method: Quantitative Chemiluminescent Immunoassay (CLIA)

- Aids in differentiation of IBD from IBS and other functional disorders of the GI system
  - Not specific for IBD
- Aids in monitoring IBD and prediction of relapse
Test Interpretation

Clinical Validation

Screening performance for IBD

- Sensitivity: 93% in adults; 92% in children
- Specificity: 96% in adults; 76% in children
- More sensitive and specific than serum inflammatory markers
- Individuals with high pretest probability of IBD (>75%) should be referred directly to endoscopy due to the risk of false-negative calprotectin results
- Screening for elevated fecal calprotectin in individuals with low pretest probability for IBD may result in cost savings by reducing need for unnecessary procedures
  - Confirm positive results by endoscopy and follow negative result clinically

Results

<table>
<thead>
<tr>
<th>Results</th>
<th>Range</th>
<th>Clinical Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>≤50 μg/g</td>
<td>Likely to rule out IBD in adults with &lt;75% prior probability</td>
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<tr>
<td>Borderline</td>
<td>51-120 μg/g</td>
<td>Reevaluation in 4-6 weeks is recommended</td>
</tr>
<tr>
<td>Abnormal</td>
<td>≥121 μg/g</td>
<td>Supports diagnosis of IBD</td>
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</tbody>
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Limitations

- Calprotectin is not specific for IBD and is also elevated in:
  - GI infections
  - Colorectal cancer
  - Celiac disease
    - Mild elevations may be seen with nonsteroidal anti-inflammatory drug or aspirin use
- Calprotectin concentration alone is not diagnostic for IBD
- Calprotectin does not distinguish celiac disease from UC
  - Results may fluctuate as disease activity fluctuates
  - GI bleeding can cause mild increases in fecal calprotectin concentrations
- Concentrations of fecal biomarkers may vary in different stool samples from a single patient

References


**Related Information**

**Inflammatory Bowel Disease - IBD**

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