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NEW BETA-HYDROXYBUTYRATE ASSAY

Annu Khajuria, PhD; Chemistry 24 Hour Services

Effective May 12, 2014, a new beta-hydroxybutyrate assay will used at Marshfield Labs.

BACKGROUND

The American Diabetes Association recommends beta-hydroxybutyrate (BOH) as the preferred method for diagnosing and monitoring the treatment of diabetic ketoacidosis.

BOH is the predominant ketone body in the blood. It is the most sensitive marker for detecting ketosis. Ketone bodies are catabolic products of free fatty acids. Beta-hydroxybutyrate accounts for 78% of ketone bodies in the blood; the other two are acetoacetate (20%) and acetone (2%).

BOH is increased in alcoholic ketoacidosis, lactic acidosis (shock, renal failure), liver disease, infections, and salicylate poisoning. BOH has been shown to be better than urinary ketones in managing seizure reduction in patients on a ketogenic diet with refractory epilepsy.

METHOD

The new assay is an enzymatic quantitation by beta-hydroxybutyrate dehydrogenase. Laboratory method evaluation has shown improved precision and accuracy in comparison to the current assay. Reference intervals have been evaluated for the new beta-hydroxybutyrate assay in normal subjects.

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TEST INFORMATION

Test Name:
Beta-Hydroxybutyrate

Test Code:
BOH

Specimen Requirements:

Fasting Required	No
Specimen Type	Plasma
Container/Tube	Lithium heparin

Performing Lab:
Marshfield Center

Reference Values:
Adult & Pediatric: ≤0.3 mmol/L

QUESTIONS

For more test information refer to Marshfield Labs Test Reference Manual as of May 12, 2014.

For clinical & technical information contact:
Clinical questions: Annu Khajuria, PhD, Chemistry - 24 Hour Services, at 1-6311 or 715-221-6311.
Technical questions: Bryan Robeson, Chemistry - 24 Hour Services, at 1-6334 or 715-221- 6334.

REFERENCES

- Klocker AA, Phelan H, Twigg SM and Craig ME. Blood beta-hydroxybutyrate vs urine acetoacetate testing for the prevention and management of ketoacidosis in type 1 diabetes: a systematic review. Diabetic Med., 2013; 30: 818-824.
- Vanelli M, Chiari G, Capuano C, Iovane B, Bernardini A, Giacalone T. The direct measurement of 3-beta-hydroxybutyrate enhances the management of diabetic ketoacidosis in children and reduces time and costs of treatment. Diabetes Nutr Metab. 2003; 16: 312-316.
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- Delft R, Lambrechts D, Verchuure P, Hulsman J and Majoie M. Blood beta-hyroxybutyrate correlates better with seizure reduction due to ketogenic diet than do ketones in the urine. Seizure. 2010; 19: 36-39.

NEW LIVER-SPECIFIC ANTINUCLEAR ANTIBODY INDIRECT IMMUNOFLUORESCENCE ASSAY

Joyce J. Flanagan, PhD, Clinical Chemist; Jeffrey M. Resnick, MD, Pathologist

Effective May 21, 2014, an antinuclear antibody (ANA), liver-specific, immunofluorescence assay (IFA), (test code: ANALIV) will be orderable. The initial titer of this ANA IFA starts at 1:40 and is used as one of the scoring criteria to aid in the diagnosis of liver-specific autoimmune diseases such as autoimmune hepatitis (AIH). Titer and pattern will be reported for positives. Regular ANA IFA for the evaluation of connective tissue-related diseases (test code: ANA) starting titer remains at 1:80.

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QUESTIONS

For more test information refer to Marshfield Labs Test Reference Manual as of 5/21/2014.

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Technical contact: Joyce Flanagan, PhD, Immunodiagnostics, at ext. 1-6310 or 715-221-6310.
Assistant manager: Greg Simon, Immunodiagnostics, at ext. 1-6343 or 715-221-6343.

REFERENCE

Manns MP, Czaja JA, Gorham JD, Krawitt EI, Mieli-Vergani G, Bergani D, and Vierling JM. AASLS practice guidelines: Diagnosis and management of autoimmune hepatitis, Hepatology 2010; 51: 1-31.

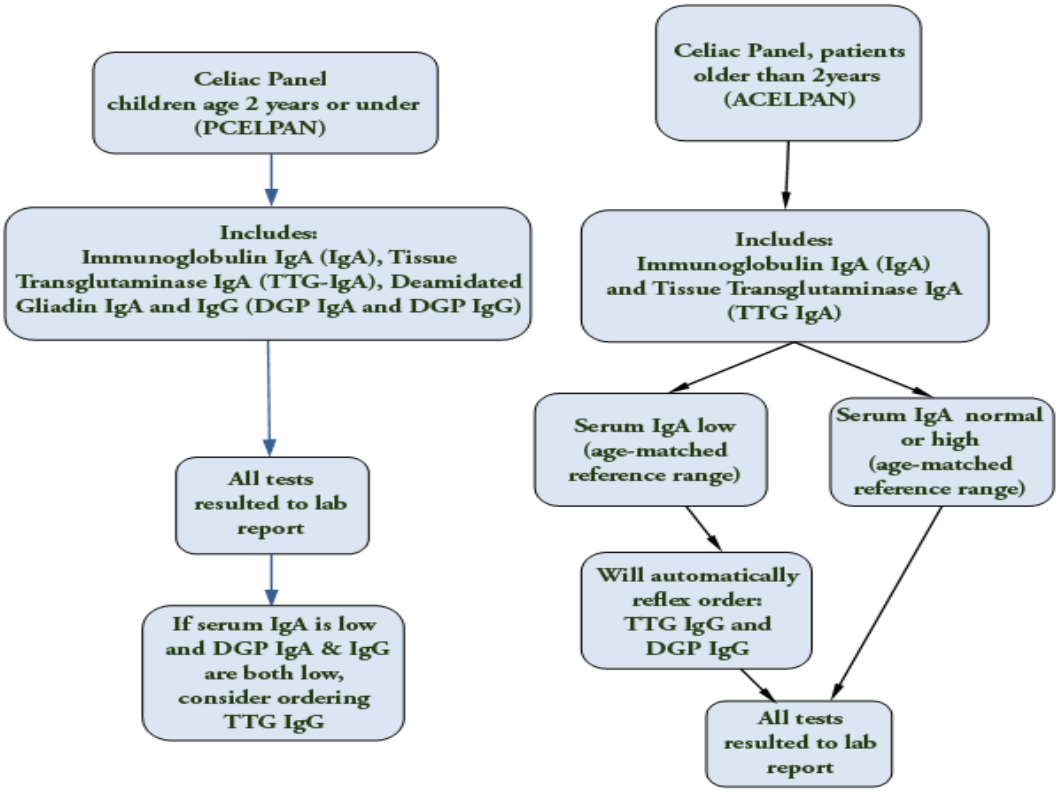
CHANGES IN CELIAC DISEASE SCREENING PANELS

Joyce L. Flanagan, PhD, Clinical Chemist; Jeffrey M. Resnick, MD, Pathologist

Effective June 1st, 2014, tests performed in the Celiac Screening panels, Celiac Panel, Adult (ACELPAN) and Celiac Panel, Pediatric (PCELPAN), will be updated per 2013 American College of Gastroenterologists practice guidelines.

SEROLOGIC SCREENING FOR CELIAC DISEASE

Maintaining a gluten-containing diet prior to testing is recommended in order to minimize the risk of false-negative lab results.



There is no methology change in the celiac disease-specific serology tests, and all tests may be ordered separately.

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HOW TO ORDER

Test Description	Order Code	CPT code
Celiac panel for children age 2 years or under	PCELPAN	IGA:82784 TTG IGA:83516 DGP IGA:83516 DGP IGG:83516
Celiac panel for patients older than 2 years	ACELPAN	Initial IGA:82784 TTG IGA:83516 Reflex TTG IGG:83516 DGP IGG:83516
Tissue Transglutaminase IgA	TTG-IGA	83516
Tissue Transglutaminase IgG	TTG-IGG	83516
Deamidated Gliadin IgA	GL IGA	83516
Deamidated Gliadin IgG	GL IGG	83516

QUESTIONS

For more test information refer to Marshfield Labs Test Reference Manual as of 6/1/2014.

Interpretive questions: Jeffrey M. Resnick, MD, Pathologist, at ext. 1-6112 or 715-221-6112.
Joyce Flanagan, PhD, Immunodiagnostics, at ext. 1-6310 or 715-221-6310.
Assistant manager: Greg Simon, Immunodiagnostics, at ext. 1-6343 or 715-221-6343.

BACKGROUND

Celiac disease (CD) is one of the most common causes of chronic malabsorption and remains underdiagnosed in the United States. Celiac disease can present with many symptoms, including typical gastrointestinal symptoms: diarrhea, steatorrhea, weight loss, bloating, flatulence, abdominal pain; and also nongastrointestinal abnormalities: abnormal serum liver-associated enzyme levels, iron deficiency anemia, bone disease, skin disorders, and many other protean manifestations. Some CD patients are asymptomatic. Celiac disease is usually detected by serologic testing (e.g., tissue transglutaminase IgA antibody). The diagnosis is confirmed by duodenal mucosal biopsies. Both serology and biopsy should be performed on patients whose diet has included gluten-containing foods.

The 2013 American College of Gastroenterologists (ACG) guidelines make recommendations based on the current literature and present a summary of the evidence supporting those recommendations.

Recommendations of when to test for CD

1. Patients with symptoms, signs, or laboratory evidence suggestive of malabsorption, such as chronic diarrhea with weight loss, steatorrhea, postprandial abdominal pain, and bloating, should be tested for CD. (Strong recommendation, high level of evidence)
2. Patients with symptoms, signs, or laboratory evidence for which CD is a treatable cause should be considered for testing for CD. (Strong recommendation, moderate level of evidence)
3. Patients with a first-degree family member who has a confirmed diagnosis of CD should be tested if they

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show possible signs or symptoms or laboratory evidence of CD. (Strong recommendation, high level of evidence)
4. Consider testing of asymptomatic relatives with a first-degree family member who has a confirmed diagnosis of CD. (Conditional recommendation, high level of evidence)

Recommendations on diagnosis of CD

1. Immunoglobulin A (IgA) anti-tissue transglutaminase (TTG) antibody is the preferred single test for detection of CD in individuals over the age of 2 years. (Strong recommendation, high level of evidence)
2. When there exists a high probability of CD wherein the possibility of IgA deficiency is considered, total IgA should be measured. An alternative approach is to include both IgA and IgG-based testing, such as IgG-deamidated gliadinpeptides (DGPs), in these high-probability patients. (Strong recommendation, moderate level of evidence)
3. In patients in whom low IgA or selective IgA deficiency is identified, IgG-based testing (IgG DGPs and IgG TTG) should be performed. (Strong recommendation, moderate level of evidence)
4. If the suspicion of CD is high, intestinal biopsy should be pursued even if serologies are negative. (Strong recommendation, moderate level of evidence)
5. All diagnostic serologic testing should be done with patients on a gluten-containing diet. (Strong recommendation, high level of evidence)
6. Antibodies directed against native gliadin are not recommended for the primary detection of CD. (Stong recommendation, high level of evidence)
7. Combining several tests for CD in lieu of TTG IgA alone may marginally increase the sensitivity for CD but reduces specificity and therefore is not recommended in low-risk populations. (Conditional recommendation, moderate level of evidence)
8. When screening children younger than 2 years of age for CD, the IgA TTG test should be combined with DGP (IgA and IgG). (Strong recommendation, moderate level of evidence)

Recommendation on the role of ancillary testing in CD

1. HLA-DQ2/DQ8 testing should not be used routinely in the initial diagnosis of CD. (Strong recommendation, moderate level of evidence)
2. HLA-DQ2/DQ8 genotyping testing should be used to effectively rule out the disease in selected clinical situations. (Strong recommendation, moderate level of evidence). Examples of such clinical situations include but are not limited to:
   a. Equivocal small-bowel histological finding (Marsh I – II) in seronegative patients.
   b. Evaluation of patients on a gluten-free diet (GFD) in whom no testing for CD was done before GFD.
   c. Patients with discrepant celiac-specific serology and histology.
   d. Patients with suspicion of refractory CD where the original diagnosis of celiac remains in question.
   e. Patients with Down's syndrome.
3. Capsule endoscopy should not be used for initial diagnosis, except for patients with positive-celiac specific serology who are unwilling or unable to undergo upper endoscopy with biopsy. (Strong recommendation, moderate level of evidence)
4. Capsule endoscopy should be considered for the evaluation of small-bowel mucosa in patients with complicated CD. (Strong recommendation, moderate level of evidence)
5. Intestinal permeability tests, D-xylose, and small-bowel follow-through are neither specific nor sensitive

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and are not recommended for CD diagnosis. (Strong recommendation, moderate level of evidence)

6. Stool studies or salivary tests are neither validated nor recommended for use in the diagnosis of CD. (Strong recommendation, weak level of evidence)

REFERENCES

1. Rubio-Tapia A, Hill ID, Kelly CP et al. ACG Clinical Guidelines: Diagnosis and management of celiac disease. Am. J. Gastroenterol., 2013, 108(1), 656-676.
2. Husby S, Koletzko S, Korponay-Szabo IR et al. European society for pediatric gastroenterology, hepatology, and nutrition guidelines for the diagnosis of celiac disease. J Pediatr Gastroenterol Nutr, 2012, 54(1), 136 -153.