

*Immunopath Update™*

# IMMULISA™ CELIAC G<sup>+</sup> *An enhanced immunoassay for detecting antibodies to gliadin*

## *A Novel Immunoassay for Celiac Disease Diagnosis*

### ■ INTRODUCTION

Celiac Disease (CD) is an autoimmune gastrointestinal disorder that may occur in genetically susceptible individuals triggered by the ingestion of gluten-containing grains such as wheat, barley and rye. CD is characterized by malabsorption resulting from inflammatory injury to the small intestinal mucosa and, when prolonged, can cause malnutrition. The classical symptoms of CD include diarrhea, weight loss and malnutrition. However, only a small percentage of patients with CD present with classical symptoms. Consequently, the clinical spectrum of CD has grown much broader than in the past to include patients that do not present with classical symptoms. It is not uncommon for the initial symptoms to be non-gastrointestinal or for gastrointestinal symptoms, if present, to be mild or intermittent. Some of the common non-gastrointestinal manifestations include short stature, iron and folate deficiency, anemia, bone loss, aphthous stomatitis, arthralgia, and dental enamel defects. The need to examine a wider range of clinical presentation has led to greater numbers of individuals diagnosed with CD later in life than ever before. Adults may present with iron deficiency, macrocytic anemia and hypocalcaemia.

### ■ DIAGNOSIS

Studies have found the prevalence of CD to be highly variable from population to population. The actual prevalence has been difficult to ascertain. The disparate criteria used in the diagnosis of CD are often the cause. Diagnosis of CD based on clinical criteria can be misleading and may lead to serious delays in proper diagnosis. Frequently, delays in diagnosis extend 10-13 years from the first clinical presentation of symptoms.

Failure to diagnose CD early on may predispose an individual to long-term complications such as splenic atrophy and intestinal lymphoma. The incidence of lymphoma arising in the context of CD is difficult to ascertain. One study has shown incidence of lymphoma involving the gastrointestinal (GI) tract in patients with CD to range from 3.6 percent to 40 percent. In another recent study, CD is associated with significantly elevated risk for intestinal lymphoma, especially for non-Hodgkin's. A gluten-free diet (GFD) normalizes the mucosa and helps reduce the malignant potential. The overall risk of malignancy in patients with CD on strict GFD for more than five years is very close to the general population.

The advent of serological methods for the detection of antibodies to gliadin, endomysium and tissue transglutaminase have enabled large scale screening studies for CD both in Europe and the United States. These studies suggest that CD is far more prevalent than previously thought. Recent serological studies demonstrate similar incidences of CD of approximately one in 130. Prevalence of CD is much higher in first and second degree relatives of patients with CD.

CD has been associated with many other autoimmune disorders such as type 1 diabetes, thyroid autoimmunity and other autoimmune disorders. Approximately 5 percent of patients with type 1 diabetes have CD. Similarly, approximately the same percentage of patients with CD has type 1 diabetes. Early detection of CD may be beneficial in such cases as it is believed that adherence to a GFD may delay the onset of diabetes. If true, this further emphasizes the utility of and need for serum antibody tests in the screening of population genetically susceptible for CD.

Serological methods of diagnosis are commonly used to screen and support diagnosis of CD and DH. The revised European Society of Paediatric Gastroenterology and Nutrition (ESPGAN) criteria for diagnosis of CD include only a single biopsy with clear cut remission of clinical symptoms on GFD. Positive serology at the time of diagnosis with disappearance on GFD contributes to the diagnosis.

Anti-gliadin antibodies (AGA) in combination with other serological assays are commonly used in the diagnosis of CD. Both IgA and IgG gliadin antibodies are detected in the sera of patients with CD. IgG gliadin antibody tests are important towards the diagnosis of CD in patients who are IgA deficient. Studies show that 1-2% of the general population is IgA deficient and that the incidence of CD in IgA deficient subjects is significant, hence the need for specific tests. Because of the limitations of the existing gliadin immunoassays, **IMMCO has developed next generation assays (Celiac G<sup>+</sup>) for detection of gliadin antibodies using proprietary technology.**

## Superiority of Celiac G<sup>+</sup> over other Gliadin peptide immunoassays

Assay	IgA		IgG	
	Clinical Sensitivity	Clinical Specificity	Clinical Sensitivity	Clinical Specificity
IMMCO Celiac G <sup>+</sup>	84%	96%	91%	97%
Gliadin Peptide Competitor	64%	92%	90%	98%

*Study conducted using well-characterized CD patient sera, disease controls, and healthy normal subjects*

### Celiac G<sup>+</sup>

- Specific and sensitive method of detecting CD.
- Correlates with EMA positivity and titers.
- Strong complement to tTG and EMA antibody tests.
- IgG detects IgA deficient CD patients with reliability.

### SPECIMEN REQUIREMENTS

**IMMCO Test Name:** Celiac G<sup>+</sup>

**IMMCO Test Code:** #102

**Methodology:** ELISA

**Reference Range:** Negative: <20.0 EU; Weak positive: 20.0-30.0 EU; Positive: >30.0 EU

**Schedule/Turnaround Time:** Assay performed daily Mon.-Fri. Report availability is within 48 hours from the time of specimen receipt.

**Specimen Requirements:** Specimen need not be refrigerated or frozen. Collect 5-10 ml of blood in a red top or serum separator tube. If possible, separate serum from clot and place into orange tube provided with IMMCO collection kits. Do not puncture top of orange tube. If separation facilities are not available, the blood can be sent in the tube used for collection.

**Sample Stability:** Sample is stable at ambient temperature during shipment. If sample is stored prior to shipment, it is stable refrigerated (2-8°C) up to five days and frozen (-20°C or lower) up to one year.

### SAMPLE SUBMISSION

Specimen collection kits are available free of charge by calling **1-800-537-8378** or e-mail request to **service@immco.com**.

Specimen can be shipped by courier services, U.S. Postal service and overnight carriers free of charge. Results are reported within two business days of the receipt of the specimen via mail, fax and at **immco.com**, a HIPAA compliant patient tracking system.

### IMMCO TESTS

Endomysial Antibodies – EMA: IgA  
IMMCO Test Code: 100

Endomysial Antibodies – EMA: IgG  
IMMCO Test Code: 110

Tissue Transglutaminase Antibodies – tTG-IgA  
IMMCO Test Code: 108

Tissue Transglutaminase Antibodies – tTG-IgG  
IMMCO Test Code: 111

Reticulin – IMMCO Test Code: 101

Immunoglobulin IgA  
IMMCO Test Code: 401

Celiac Disease Profile I:  
IMMCO Test Codes: 100, 108

Celiac Disease Profile II:  
IMMCO Test Codes: 100, 101, 102, 108

Celiac Disease Profile III:  
IMMCO Test Codes: 100,102,108

IgA Deficient Celiac Disease Profile:  
IMMCO Test Codes: 110,102, 401

### SUGGESTED READING

Bansal A, Ramsperger V, Kumar V. Celiac G<sup>+</sup> antibody assay for the detection of antibodies in celiac disease. Contemporary Challenges in Autoimmunity: Am. N.Y. Acad. Sci. 1173:36-40, 2009.

Rashtak S, Ettore MW, Homburger HA, Murray JA. Comparative usefulness of deamidated gliadin antibodies in the diagnosis of celiac disease. Clin Gastroenterol Hepatol. 6:426-32, 2008.

Mothes T. Deamidated gliadin peptides as targets for celiac disease specific antibodies. Adv Clin Chem 44:36-63, 2007.

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