CELIAC DISEASE-ASSOCIATED ANTIBODIES IN PATIENTS WITH DERMATITIS HERPETIFORMIS

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KEY MESSAGE

Measurement of anti-tTG and anti-DGP IgG and IgA by particle-based multi-analyte technology and chemiluminescence assay showed strong correlation when testing patients with dermatitis herpetiformis.

INTRODUCTION

Dermatitis herpetiformis (DH) is an extra-intestinal manifestation of celiac disease (CD) characterized by chronic, intensely itchy, blistering skin manifestations affecting approximately 13% of patients with CD. The diagnostic standard for DH is demonstration of characteristic granular IgA deposits in the papillary dermis and/or along the dermal-epidermal junction by direct immunofluorescence (IF) in a perilesional skin biopsy specimen. Patients with DH also typically have serum IgA to tissue transglutaminase, tTG (transglutaminase type 2 or TG2), to epidermal transglutaminase, eTG, (transglutaminase type 3 or TG3), or to both. This aim of this study was to compare a novel particle-based multi-analyte technology (PMAT, Research Use Only, Inova Diagnostics) with validated assays performed in clinical laboratories for detection of CD-associated antibodies in a select group of DH patients.

METHODS

Twenty-six serum specimens from patients with DH tested in the Immunodermatology Laboratory (Univ. Utah) were selected to cover a range of antibody reactivity determined by the lab's routine assays. Deidentified specimens were tested blindly for anti-tTG and anti-deamidated gliadin peptide (DGP) IgA and IgG by PMAT and, in parallel, by FDA-cleared QUANTA Flash® (QF) tTG and DGP IgA and IgG chemiluminescent immunoassays (CIA) (Inova Diagnostics). Anti-TG3 (eTG) was tested by a commercial ELISA (Research Use Only, ALPCO). Qualitative-/quantitative correlations and performance were assessed for each analyte.

Correlations were considered strong for $p<0.0001$ and weakly, but significantly correlated for $p<0.05$.

RESULTS

There was a strong correlation between anti-tTG IgA levels between CIA and PMAT assays (Figure 1,Table 2). Of the 26 DH patients, 25 were positive by all anti-tTG IgA assays. One DH patient positive for anti-tTG IgA in a previous specimen was negative for anti-tTG IgA by CIA, PMAT, and IgA endomysial antibodies by indirect IF on the current specimen.

Table 1 Prevalence of celiac disease (CD)-associated markers with various assays.

Analyte	PMAT, n (%)	CIA, n (%)	ELISA, n (%)
Anti-tTG IgA	25/26 (96.2)	25/26 (96.2)	26/26 (100.0)
Anti-DGP IgA	18/26 (69.2)	20/26 (76.9)	n/a
Anti-tTG IgG	8/25 (32.0)	6/25 (24.0)	n/a
Anti-DGP IgG	19/25 (76.0)	15/25 (60.0)	n/a
Anti-eTG (TG3) IgA	n/a	n/a	23/24 (95.8)

Table 2 Correlation of celiac disease (CD)-associated markers in comparisons of the various assays.

Parameters Compared	Spearman's *rho* (95% CI)	*p*-value	Interpretation
Anti-tTG IgA (PMAT vs. CIA)	0.99 (0.98-1.00)	<0.0001	Strong correlation
Anti-tTG IgA (PMAT vs. ELISA)	0.91 (0.80-0.96)	<0.0001	Strong correlation
Anti-tTG IgA (PMAT) vs. anti-eTG IgA (ELISA)	0.44 (0.03-0.72)	0.0322	Weak correlation
Anti-tTG IgG (PMAT vs. CIA)	0.78 (0.55-0.90)	<0.0001	Strong correlation
Anti-DGP IgA (PMAT vs. CIA)	0.96 (0.91-0.98)	<0.0001	Strong correlation
Anti-DGP IgG (PMAT vs. CIA)	0.95 (0.89-0.98)	<0.0001	Strong correlation

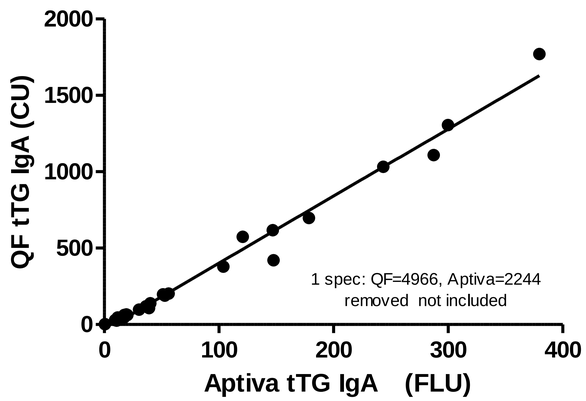

Figure 1 Correlation between QUANTA Flash® (QF) and Aptiva® tTG IgA by linear regression analysis. High level of correlation was observed. CU= chemiluminescent unit; FLU=fluorescent unit

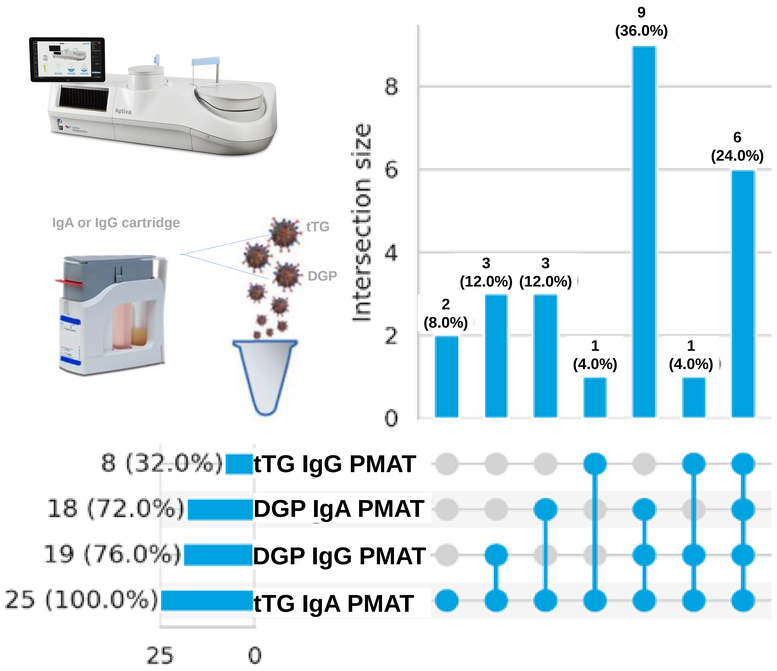

Figure 2 UpSet plot illustrating the intersection between the of celiac disease (CD)-associated markers on the novel particle based multi-analyte technology (PMAT). Note: Only 25 out of the 26 dermatitis herpetiformis (DH) patients have results for all assays

CONCLUSION

Anti-tTG and DGP IgA and IgG assessed using the novel PMAT assay showed strong positive correlations with other established diagnostic testing in sera from patients with DH. Excellent agreement also was found comparing the Aptiva Celiac Disease PMAT assays and QUANTA Flash tTG and DGP CIA (FDA-cleared) assays.

REFERENCES

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