Transglutaminase 6 antibodies are elevated in the serum of multiple sclerosis patients.

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Multiple sclerosis (MS), the most prevalent chronic neurological disease among young adults, is an autoimmune disease of the central nervous system characterized by loss of myelin and neurodegeneration. MS pathogenesis is best understood to be an autoimmune response against myelin in a genetically predisposed population that has been exposed to a currently unknown environmental trigger.

Celiac Disease is the overt gastrointestinal manifestation of an autoimmune reaction triggered by a known environmental trigger—gluten—a protein found in commonly consumed grains. Gluten can cause extraintestinal manifestations with or without gastrointestinal symptoms and elevated antitissue transglutaminase 2 (tTG2) autoantibodies. Organ-specific gluten reaction involves immune response toward other transglutaminase (TG) isoforms including tTG3 (expressed in the skin, leading to dermatitis herpetiformis) and tTG6 (expressed in the brain, causing gluten ataxia and possibly correlated with Schizophrenia).

A number of studies have shown increased rates of celiac antibodies associated with different autoimmune diseases, including type 1 diabetes, thyroid disorders, and MS. One study found 10% of MS patients to have positive celiac antibodies compared to 2.4 % of the control group. Although there are conflicting studies showing no increase in celiac antibodies in MS, one aspect of the conflicting results may be the inconsistency of the type of antibodies measured as well as differing thresholds for positive test results.

In this study we investigated the serum levels of tTG6 antibodies in MS patients, which have never been studied before. Using a commercially available ELISA kit, we found a higher prevalence of tTG6 antibodies (either IgA or IgG) in MS patients compared to healthy control individuals. Our results indicate that serum levels of tTG6 antibodies may represent a biomarker useful to identify MS patients who would benefit from a gluten-free diet.