

**FUNCTIONAL MEDICINES' VIEWS ON A RECENT STUDY LINKS MATERNAL
GLUTEN INTAKE TO TYPE 1 DIABETES IN CHILDREN.**

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For the first time in humans, researchers have found evidence that maternal gluten intake during pregnancy may be strongly associated with the subsequent risk of offspring developing type 1 diabetes. The study suggests that pregnant women who eat 20g or more of gluten a day are twice as likely to have a child with type 1 diabetes than women who eat less than 7g of gluten a day.

Women in the study ate an average of 13g of gluten per day, ranging from less than 7g/day to more than 20g/day. The incidence of type 1 diabetes among children in the cohort was 0.37%, with a mean follow-up period of 15.6 years. Results include data from more than 67,500 pregnant Danish women and were published in July 2018 in the British Medical Journal.

Epidemiological data suggest that the incidence of type 1 diabetes is highest in countries following a Western lifestyle, 0.5% of US adults have been diagnosed with this autoimmune disease (among those diagnosed with diabetes, type 1 accounts for 5.6%). On average, type 1 diabetes has been increasing at a rate of 3-4% per year in Europe, particularly in children below age 5. Researchers speculate that this increase is faster than can be accounted for by genetic drift, indicating the possible involvement of environmental factors.

For several years, animal models have shown the effect of diet on the development of type 1 diabetes. In 2016, researchers investigated the importance of gluten exposure in mice during pregnancy and the subsequent development of autoimmune diabetes in offspring. The results showed that if mothers were fed a gluten-free diet only during pregnancy the development of autoimmune diabetes in offspring was almost completely prevented. A 2018 study in non-obese diabetic mouse offspring found that a gluten free diet during pregnancy ameliorated autoimmune diabetes in mouse offspring.

One of the first accounts of non-celiac gluten sensitivity was recorded in The Lancet in 1978. The first study in eight non-celiac patients who showed the deleterious effects of 20g of gluten per day was published in 1980 in the journal Gastroenterology. The incidence of celiac disease has risen since the 1950's when

dickie, Weyers, and Van D Kamer characterized gluten as the precipitating factor of the manifestations of celiac disease, it has since emerged as a major public health problem. A 2018 meta-analysis found the current worldwide prevalence of celiac disease to be 1.4% based on blood tests. The prevalence was higher in females than males and was significantly greater in children than in adults.

Interestingly, celiac disease is common in patients with type 1 disease, the association between celiac disease and type 1 diabetes was first reported in the late 1960's by Walker-Smith et al. Over the last five decades, studies suggest that storage proteins gliadin, secalin, and horein may have toxic effects on intestinal cells in gluten sensitive people, including the reduction of F-actin, inhibition of cellular growth, premature cell death, rearrangement of the cytoskeleton, and increased small bowel permeability. Studies suggest that celiac disease and type 1 diabetes are two chronic conditions that often occur together in the same individual due to the sharing of susceptibility genes, celiac disease and type 1 diabetes share common genetic make-up with the HLA-DQB1 gene on chromosome 6p21 being affected in the majority of patients who suffer from both conditions. Over 90% of celiac disease cases and roughly 70% of patients with type 1 diabetes are thought to carry the HLA heterodimer DQA1*05 DQb1*0201.

As our understanding about the connection between gluten and autoimmune diseases like type 1 diabetes and celiac disease continues to evolve, many Functional Medicine clinicians already recommend a gluten-free or low-FODMAP diet for some patients. Functional medicine espouses an individualized approach to diet in order to address co-morbidities, food sensitivities or other factors.

Dr. Badanek has been and currently is 38 years into active/private practice in the Ocala/Marion County, Florida region. Dr. Badanek practices Natural/Holistic Medicine through the use of Functional/Integrative Models for diagnostic and treatment protocols for the health challenged. Find him online at Dr.Badanek.com and www.alternativewholistic.com, and see what the facility has to offer the sick and health challenged. To schedule an appointment call 352-622-1151