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Celiac Disease: Advances in Diagnostic Testing?

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Celiac Disease: Advances in Diagnostic Testing?

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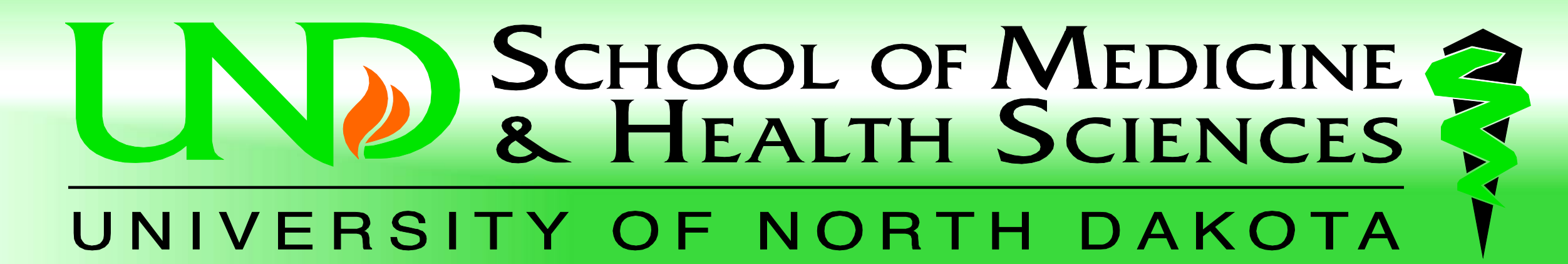
Abstract

- Celiac disease (CD) is a gluten-sensitivity enteropathy that occurs in genetically susceptible individuals upon ingestion of gluten and resolves when gluten is withdrawn from one's diet.
- Serological markers play a major role in the diagnosis of celiac disease, however a small intestinal biopsy is currently the gold standard in symptomatic individuals.
- The purpose of this study was to determine if serological testing alone is sufficient to confirm the diagnosis of CD and therefore eliminate the need for a biopsy.
- The review of literature explored studies that compared small intestinal biopsy with different serological testing in males and females, <1 to 80 years in age, in order to determine if a biopsy was always necessary.

Introduction

- Celiac disease (CD) is an autoimmune disorder of the gastrointestinal tract that has increased in prevalence significantly over the recent years.
- Occurs in genetically susceptible individuals upon ingestion of gluten.
- Because gluten is the known trigger, the logical treatment option would be to eliminate gluten from a person's diet, also known as, a gluten free diet (GFD).

Statement of the Problem

- If small bowel biopsies can be disregarded as a mandatory diagnostic testing when specific serologic levels of transglutaminase antibodies are reached, then patients can avoid an invasive procedure and this will ultimately lead to a more rapid diagnosis and earlier treatment.
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Research Questions

- Can serologic testing alone be sufficient to confirm the diagnosis of celiac disease in the symptomatic patient?
- In patients with celiac disease, what is the effect of a gluten-free diet in reducing symptoms compared with no treatment?

Literature Review

- Gluten is a combination of proteins and found in certain grains, such as wheat, rye and barley.
- It causes an immune-mediated response that can result in disorders such as CD.
- CD causes mucosal damage leading to villous atrophy, crypt hyperplasia, and infiltration of inflammatory cells.
- Proximal portion of the small intestine is most affected. Impaired absorption and nutrient loss are a result of its inflammatory effects.

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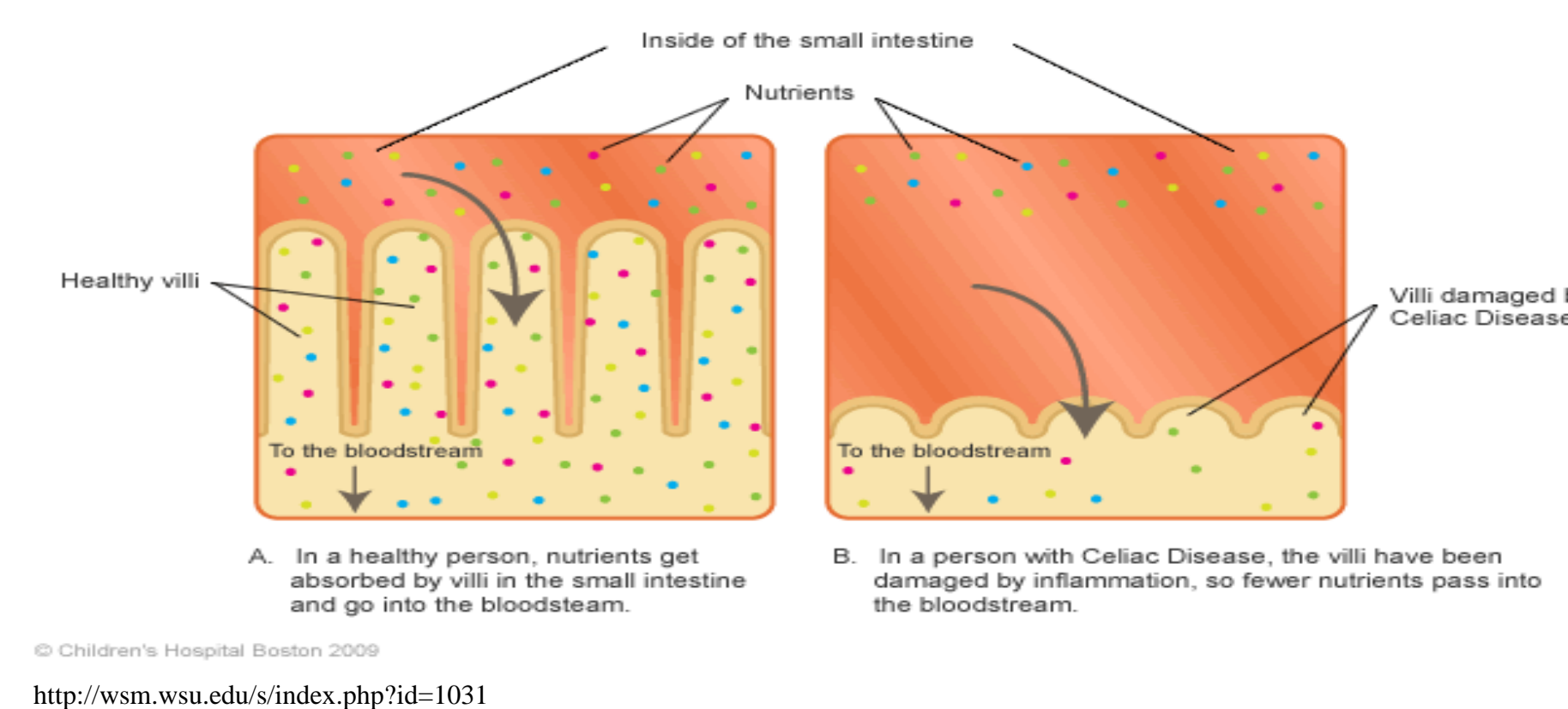
- HLA-DQ2 and HLA-DQ8 (human leukocyte antigens) - key players in the risk for CD in those genetically predisposed (HLA-DQ2 present in 95% of patients diagnosed)
- Environmental factors: Early exposure and overexposure to gluten, early infection with intestinal viruses, and changes in bacterial flora of the gut
- Its diagnosis is based on abnormal small intestinal histo-pathological findings determined by endoscopic biopsy followed by a clinical response to a strict gluten free diet
- Serologic testing is initial step in screening CD and the antibodies present include: IgA-tissue transglutaminase antibodies (IgA-tTGA), anti-gliadin antibodies, IgA-endomysial antibodies (IgA-EMA), deamidated gliadin antibodies.
- The search of literature provided the following study results:
  - Mubarak et al., 2012, found that in patients with levels of IgA-tTGA > or equal to 100 U/mL, with improved symptoms following a gluten free diet, these patients had histological lesions compatible with CD.
  - Wakim-Fleming et al., 2013, found that symptomatic patients whose tTGA levels were > 118 U and who responded to a GFD, did not necessarily warrant a small intestinal biopsy.
  - Husby et al., 2012, provided the new guidelines published in ESPGHAN for the diagnostic criteria for CD: If the IgA-tTG titers are >10 times the upper limit of normal, then the option is to diagnose CD without small bowel biopsies. Strict protocol is to be applied including confirmation of diagnosis by an antibody decline and a clinical response to a gluten free diet.
  - Norstrom et al., 2012, found that all symptoms improved as well as significant declines in tissue transglutaminase antibody levels while adhering to a GFD.

Discussion

- Serologic testing of tissue transglutaminase antibodies has proven to be effective at diagnosing celiac disease when values reach a specific level and symptoms are supportive.
- This conclusion is further reinforced by the modified criteria provided by the ESPGHAN.
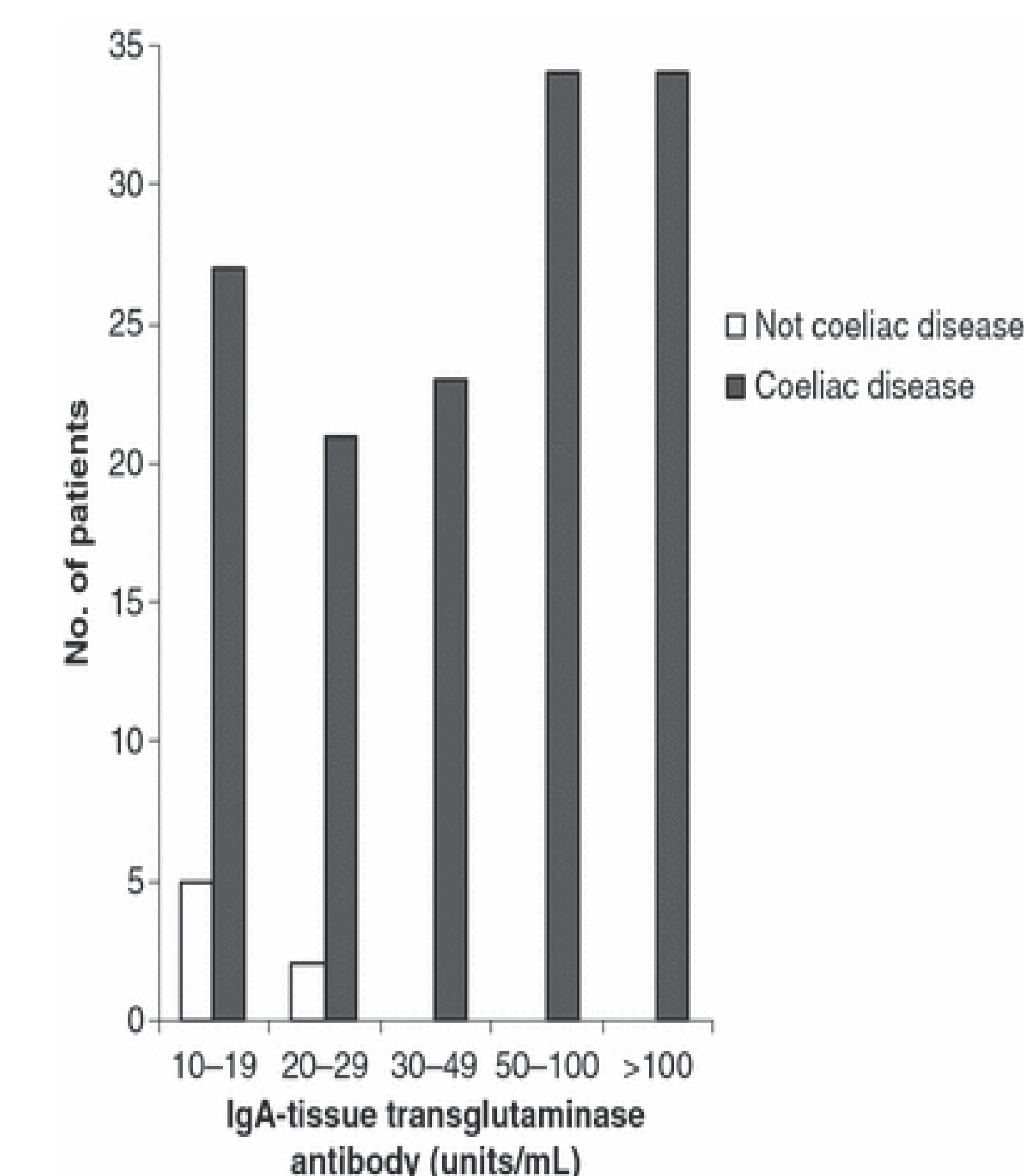
- The data does however still support the need for small intestinal biopsy in more complex patients.
- In addition to ESPGHAN's modifications to the diagnostic criteria, additional research has concluded that a gluten free diet is the current effective treatment option to alleviate the effects of this enteropathic disease.
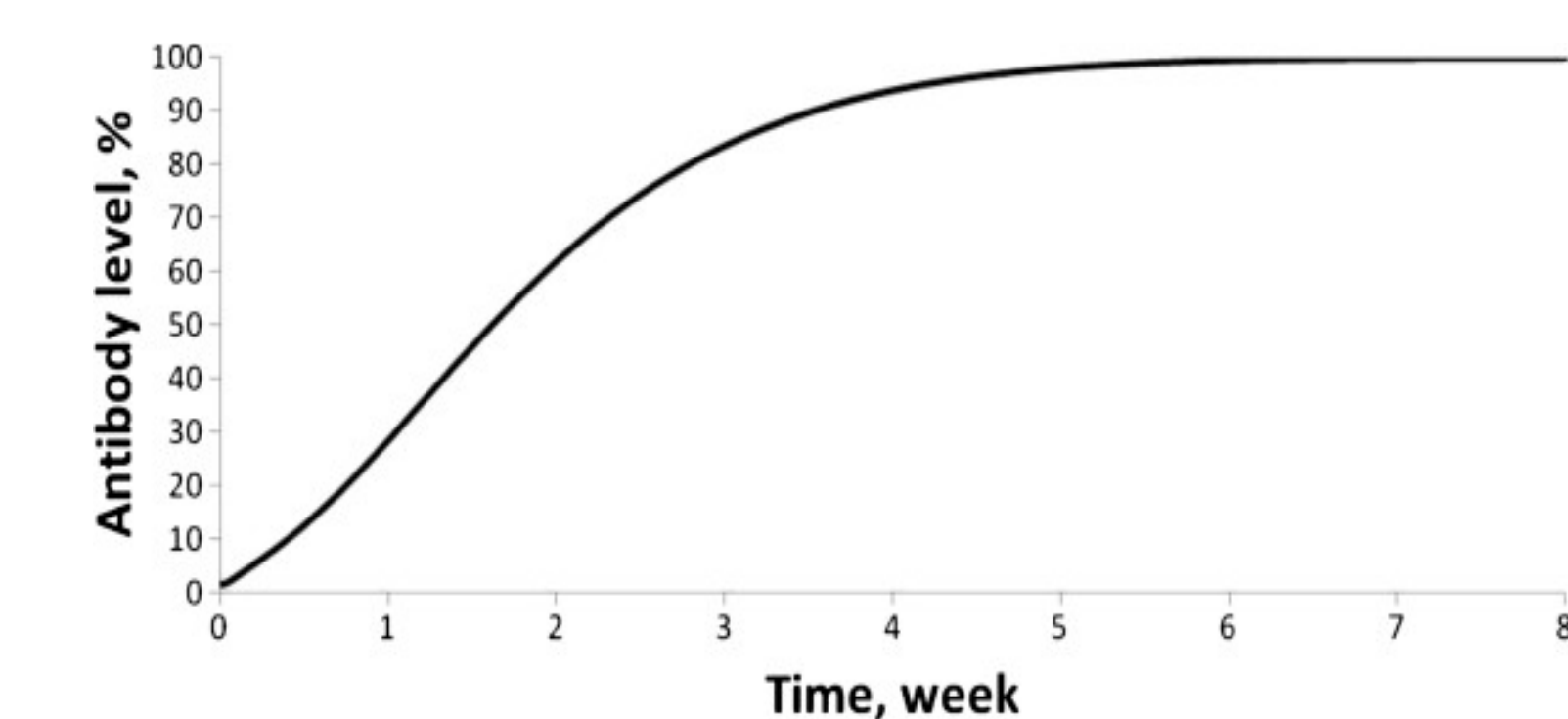
The appearance of antibodies after changing diet from gluten-free to gluten-containing.
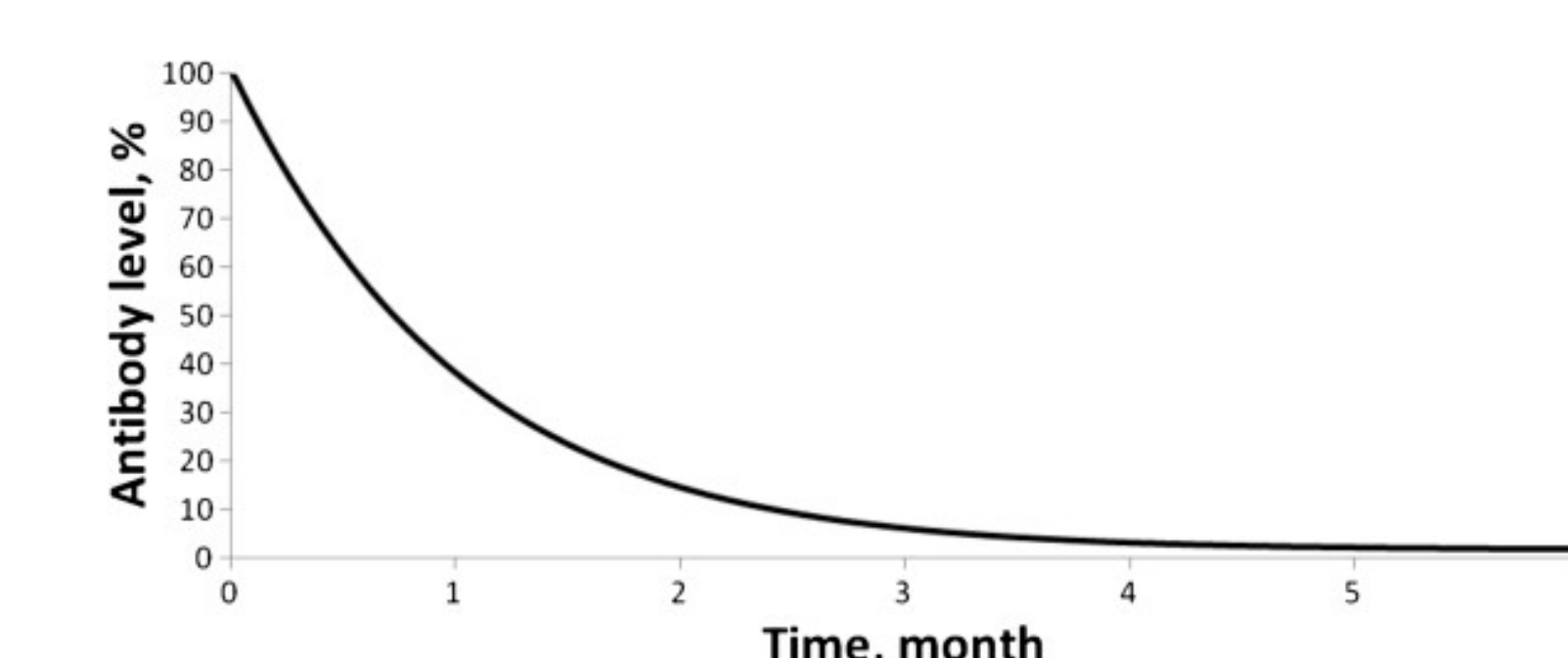
Decrease of antibodies level after changing diet from gluten-containing to gluten-free.

Applicability to Clinical Practice

- Diagnosis relies heavily on practitioner suspicion.
- Recent changes in the diagnostic criteria have created a potential for making a diagnosis by the healthcare provider sooner in the disease's development, allowing for less damage by the disease to the intestinal villi.
- Serological testing is a less invasive, less expensive approach in initiating a diagnosis.
- Key elements that need to be introduced to the patient in order to manage their disease effectively:
  *C*onsultation with a skilled dietitian
  *E*ducation about the disease
  *L*ifelong adherence to a GFD
  *I*dentify and treat nutritional deficiencies
  *A*ccess to an advocacy group
  *C*ontinuous f/u by a multidisciplinary team
- Health care providers are given the opportunity to screen their symptomatic patients with a high degree of specificity using serological testing. Not all, but a vast majority of patients will be able to initiate treatment earlier without the need for a small intestinal biopsy.

References

- Boissonneault G. (2013). Gastroenterology: Disorders triggered by gluten. *JAAPA, 26 (3)*, 13-17.
- Collin, P., & Kaukinen, K. (2013). Celiac disease: Clinch the diagnosis when it is just around the corner. *Digestive Diseases and Sciences, 58 (5)*, 1165-1166.
- Covino, J., Milito, T., Muri, M., Oakes, J., Spivey, J. MPA, PA-C. (2012). Celiac disease: Early diagnosis leads to the best possible outcome. *Journal of the American Academy of Physician Assistants, 25 (11)*, 43-47.
- Freeman, H. (2012). Celiac disease and selected long-term health issues. *Maturitas, 73 (3)*, 206-211.
- Herman ML, Rubio-Tapia A, Lahr BD, Larson JJ, Van Dyke CT, Murray JA. (2012) Patients with celiac disease are not followed up adequately. *Clin Gastroenterol Hepatol, 10 (8)*, 893-899
- Hill, P. G., & Holmes, G. K. T. (2008). Coeliac disease: A biopsy is not always necessary for diagnosis. *Alimentary Pharmacology Therapeutics, 27 (7)*, 572-577.
- Husby, S., & Murray, J. (2013). New aspects of the diagnosis of celiac disease in children, adolescents, and adults. *Mayo Clinic Proceedings*, doi:10.1016/j.mayocp.2013.03.018
- Katz KD, Rashtak S, Lahr BD, Melton LJ 3rd, Krause PK, Maggi K, Talley NJ, Murray JA. (2011). Screening for celiac disease in a North American population: sequential serology and gastrointestinal symptoms. *Am J Gastroenterol, 106 (7)*, 1333-9.
- Mubarak, Amani Wolters, Victorien Gmelig-Meyling, Frits H J Ten Kate, Fiebo J W Houwen,Roderick H J. (2012). Tissue transglutaminase levels above 100 U/mL and celiac disease: A prospective study. *World Journal of Gastroenterology, 18 (32)*, 4399-4403.
- NorstrÃƒÂ¶m, F., SandstrÃƒÂ¶m, O., Lindholm, L., & Ivarsson, A. (2012). A gluten-free diet effectively reduces symptoms and health care consumption in a Swedish celiac disease population. *BMC Gastroenterology, 12*, 125-125.
- Scanlon SA, Murray JA. (2011) Update on celiac disease - etiology, differential diagnosis, drug targets, and management advances. *Clin Exp Gastroenterol, 4*, 297-311.
- Scaramuzza, Andrea Mantegazza, Cecilia Bosetti, Alessandra Zuccotti, Gian. (2013). Type 1 diabetes and celiac disease: The effects of gluten free diet on metabolic control. *World Journal of Diabetes, 4 (4)*, 130-134.
- Shahnaz, A Maguire, G Parker, R Heuschkel, R B Zilbauer, M. (2013). Tissue transglutaminase antibody levels predict IgA deficiency. *Archives of Disease in Childhood*, doi:10.1136/archdischild-2013-303862

thanks . . .

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