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Review Article

Celiac Disease - A Review of Challenging Enteropathy

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ABSTRACT

Celiac disease is gluten induced autoimmune disease of the small intestine recognized in genetically predisposed people, which can eventually lead to the destruction of the mucosa of the small intestine. This disease has a number of clinical manifestations, including intestinal and extra-intestinal ones. In earlier times, it was reported in countries with significant and predominant Caucasian populations, but now it becomes a trending health issue in other parts of the world too. With revolution in medical technologies, diagnosis and awareness about this immune-mediated disorder has increased tremendously, resulting in a hike in number of cases in the past few years. Therefore, it is very crucial to know every aspect of the disease and the current trends in research for proper diagnosis, related symptoms and clinical manifestations (intestinal as well as extra-intestinal) for prevention of this disease by better management diet. Gluten free diet (GFD) is crucial and recommended for patients who are suffering from the disease as per present research in the area.

Keywords: *Celiac disease, Gluten, Clinical manifestations, Diagnosis, GFD.*

INTRODUCTION

Celiac disease is a chronic; gluten induced autoimmune disease of small intestine recognized in genetically predisposed people with numerous range of intestinal and extra-intestinal manifestations (Green, 2007; Pinto-Sánchez et al., 2015 & Durazzo et al., 2022). Gluten is a composite of different distinct proteins, predominantly gliadin and glutenin in wheat grain, hordein in barley, secalin in rye, and avenins in oats and these are collectively called as gluten which is known as key culprit in initiating chronic disorder, celiac disease.

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As reported by Wieser, baking quality of wheat is very much due to gluten proteins as glutens confer viscosity, water absorption capacity, elasticity and cohesivity on dough (Wieser, 2007). With revolution in the field of medical technologies, diagnosis and general awareness about this immune-mediated disorder has increased tremendously resulting in the sharp rise in number of cases in the past few years. Currently, massive research is going on diverse parameters of celiac disease based on screening of populations in various parts of the world. Therefore, it is crucial to know the current trends in research for proper diagnosis, related symptoms and clinical manifestations (intestinal and extra-intestinal) to prevent this disease by better management of GFD (Gluten free diet). In this article, we tried to review the best research papers related to celiac disease and its treatment by following strict GFD which will be practically helpful to gastroenterologists in healthcare practices.

Pathogenesis

In many research findings, celiac disease gluten sensitivity diagnosis shows inflammation of small intestinal mucosa and extra-cellular deposit of immunoglobulin IgA in jejunal mucosa (Westerholm-Ormio et al., 2002) triggered by various cytokines. However, CD is a combined response of various factors viz. genetic, immune and environmental factors to gluten (Green, 2007). Complete protein component of wheat is referred as gluten and gliadin is the fraction of gluten which triggers an immune response due to its resistance to digestion by proteases of the stomach, intestine and pancreas (Shan, 2002). These undigested peptide parts cross the intestinal barrier and antigen-presenting cells present in lamina propria interact with them. Due to this interaction in persons with celiac disease, innate and adaptive immune systems produce a chronic inflammatory response, ultimately leading to villus atrophy (Elli et al., 2017; & Annalisa et al., 2022). The genetic factor which aids in celiac disease is HLA-DQ2 or HLA-DQ8 proteins which are products of the HLA genes. However, it is important to mention that not all people (who have these alleles) develop celiac disease. These can be present in non-celiac people also. But, the presence of these alleles is crucial for manifesting celiac disease along with other factors (Kupfer & Jabri, 2012). Environmental factors that may affect the development of celiac disease and gluten tolerance include dietary and microbial factors (Levescot, 2022). Recent studies suggest that neither the time of gluten introduction nor the breast feeding contributes towards the development of disease, which was earlier supposed to be the influencing factor (Lionetti, 2015). However, further research is required in this field to confirm the role of environmental factors triggering the disease in genetically predisposed people.

Clinical Manifestations

There are two methods of clinical presentation in patients with celiac disease: intestinal and extra-intestinal (Caio et al., 2019)' which may vary according to the age of the patient. It has also been reported in the studies that the prevalence of the disease has been diagnosed more in women as compared to men (Volta et al., 2014). Intestinal manifestations in infants and younger children includes loss of appetite, failure to grow to well, abdominal distension and diarrhea (Vivas et al., 2008). In contrast, adults and older children have observed abdominal pain, weight loss, constipation, diarrhoea, irritable bowel syndrome and bloating (Reilly et al., 2011). Extra-intestinal symptoms in celiac disease patients may include various skin disorders like dermatitis herpetiformis, urticarial, atopic dermatitis, psoriasis, rosacea (Durazzo et al., 2022) and oral manifestations like delayed dental eruption, geographic tongue, xerostomia, atrophic glossitis, recurrent aphthous stomatitis and enamel defects related to colour, texture and structure (Villemur et al., 2021). These oral disorders may be attributed to the deficiency of vitamin A, B-12, and vitamin D, malabsorption of folic acid and iron, changes in calcium and phosphorus metabolism, hypocalcemia and dental demineralization

(Rodrigo et al., 2018). Other problems related to celiac disease may include neurological manifestations (headache in the form of migraine, cognitive impairment, gluten ataxia), depression, anxiety, autism, elevated level of liver enzymes, Type 1 diabetes mellitus and short stature (Valvano et al., 2020; & Qasim et al., 2022).

Diagnosis

The methodology for the diagnosis of CD is changing with advancements in research. TTG-IgA assay is used as the first line test for celiac disease diagnosis (Nardecchia et al., 2019). Patient should not be on gluten free diet while undergoing TTG-IgA to avoid the false negative results (Lebwohl and Rubio-Tapia, 2021). However, confirmation still depends on intestinal biopsies indicating villous atrophy and the serological tests. More research is required in the field of diagnosis and treatment so that non-invasive techniques can be discovered for the confirmation of disease and more effective ways to treat the disease.

Treatment

The best method known today for the treatment of celiac disease is nutritional therapy which involves a lifelong gluten free diet (GFD). Grains containing gluten should be avoided completely. However, persons on GFD may suffer from multiple vitamin and mineral deficiencies (Casella et al., 2012). Therefore, the role of a clinical dietitian is crucial while on GFD to avoid the foods containing gluten while maintaining the proper amount of nutrients to eliminate the deficiencies of important minerals and vitamins (Hallert et al., 2002).

CONCLUSIONS

Cases of celiac disease are increasing tremendously all over the world. To prevent the disease, its proper diagnosis is required after the gastroenterologists identify the specific symptoms in the patients. The present review paper tried to cover various aspects of celiac disease, which can help clinicians to manage patients suffering from CD.

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