

Gluten Related Disorders - A Clinical and Nutritional Approach

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Abstract

With the urbanization and development of mankind, digestive disorders due to wheat or its constituent gluten has seen increased prevalence globally. Celiac disease (CD), non-celiac gluten sensitivity (NCGS) and Wheat Allergy are all conditions in which the primary treatment is avoidance of specific dietary components. There are certain overlaps and often common misconceptions associated with these three conditions. Following a wheat or gluten free diet can be extremely difficult and overwhelming for an individual as well as having an impact on their nutritional status, growth and quality of life. Currently there is a lack of clarity in terms of global standard dilutions for the management of all three of the named conditions. The aim of this paper is to provide an update on different gluten related disorders, their nutritional management and to provide practical guidance on implementing the specific dietary changes.

Keywords: Gluten Diet; Clinical Stabilization; Gluten Sensitivity

Abbreviations: CD: Celiac Disease; NCGS: Non-Celiac Gluten Sensitivity.

Introduction

Celiac diseases a chronic autoimmune disease which causes damage to the small intestinal mucosa leading to malabsorption when gluten; a family of proteins found in wheat, barley and rye is ingested [1]. Similarly, NCGS is a term used to describe individuals who have intestinal signs or symptoms, extra intestinal signor symptoms, or both, related to ingestion of gluten-containing grains, with

improvement when these are removed or reduced from individual's diet [1]. However, there are no allergy related processes involved in NCGS as well as the absence of villous atrophy and celiac specific antibodies [2]. Wheat Allergy is often mistaken as celiac disease or gluten sensitivity as there is an overlap in symptoms [3]. However, it is an immune mediated response to one or more proteins found in wheat (could include gluten) whereas CD is associated with gluten alone [4]. Table 1 demonstrates a comparison between the three gluten related disorders.

	Coeliac Disease	Non-Coeliac Gluten Sensitivity	Wheat Allergy
Definition	Genetic autoimmune disease in which ingestion of gluten causes villous atrophy	Intolerance to gluten or other wheat components however without causing damage to the small intestine	Immune response to gluten as well as other proteins present within wheat
Gastrointestinal Symptoms	Diarrhoea, bloating, abdominal pain and discomfort	Diarrhoea, bloating, abdominal pain and discomfort.	Nausea, vomiting, abdominal pain / discomfort, bloating and irritation in mouth or throat
Additional Clinical Findings	Iron deficiency, weight loss, malnutrition, fatigue, infertility, joint pain, decrease in bone mineral density	Joint pain, fatigue, brain fog (slowed thinking and memory disturbances)	Rash, hives, nasal irritation and difficulty in breathing
Abnormal Intestinal Biopsy	Yes	No	No
Auto antibodies and Enteropathy	Always present	Not present	Not present
Treatment	Strict life-long adherence to a gluten free diet	Adherence to gluten and wheat free diet	Strict adherence to wheat free diet

Table 1: Clinical Comparison between Coeliac Disease, Non-Celiac Gluten Sensitivity and Wheat Allergy.

Nutritional Management of Celiac Disease

The only available treatment approach for CD is a lifelong strict adherence towards a gluten free diet [5]. Please refer to appendix 1 for in depth list of gluten containing grains to be avoided. The broad aims of dietary management are to minimize symptoms, improvement in histology, optimize quality of life, nutritional status, and growth and prevent nutritional deficiencies [1,6]. A Strict adherence towards a gluten free diet has shown to improve histological lesions, blood biochemistry, clinical manifestations and the risk of CD-related complications [1,7]. Individuals with CD can lead a normal life without any clinical manifestations and complications if there is complete abstinence of gluten in the diet. Pure oats are generally tolerated safely by the majority of people with CD, oats should be introduced into the diet with caution and patients should be monitored closely for evidence of adverse reaction [8]. However, patients can choose to include gluten-free oats in their diet at any stage [9].

Due to the complexities associated with adherence towards gluten free diet; early dietetic referral becomes imperative. It is important that individuals are well supported throughout following gluten free diet as strict adherence can be difficult and overwhelming due to the presence of gluten within a range of foods [7-9].

Specific education on which foods contain gluten, which foods are suitable alternatives and options of gluten free foods and products within the patient's locality which is appropriate culturally and economically should be discussed [7-10]. Furthermore, advice on healthy eating and minimizing risk of nutritional deficiencies whilst following a gluten free diet should be explored in detail with the patient [7]. Studies have shown that the gluten free diet can be low in fiber; so alternative sources of fiber should be explored with patients [11-13]. Moreover, dietary deficiencies such as iron, folic acid, B12, calcium and vitamin D should be monitored and supplements should be prescribed if needed (especially vitamin D and calcium if dietary intake is insufficient) [7,11,12].

Awareness and education should be provided on how to read food labels efficiently in order to assess suitability of foods whilst following a gluten free diet [7,13]. Advice on how to manage social situations such as eating out, traveling abroad and avoiding cross- contamination should be discussed with patients as a part of their treatment plan [7,8]. Individuals should also be directed to CD support networks and organizations if appropriate for further guidance and information [7,8,14]. Proper ongoing support and counseling increase the likeliness of

adherence towards a gluten free diet and positive prognosis throughout the life span [7,14-18].

Monitoring and Follow Up

All celiac disease patients should receive periodic medical follow up in order to review existing or new symptoms, adherence to gluten free diet and monitoring of nutritional status (weight, height and BMI) and deficiencies [7,8,11]. There are currently unclear universal, standardised guidelines in terms of the frequency of follow up however it is well understood that continuity of follow up and nutritional monitoring is imperative in the treatment of CD [7,8,16]. The World Gastroenterology Organization suggests biochemical and nutrition led follow up every 3-6 months until abnormal baseline tests are corrected / until clinical stabilization; then every 1-2 years (17). Patients with newly diagnosed CD should undergo testing and treatment for the micronutrient deficiencies [7,8,18]. Deficiencies to be considered for testing should include, but not be limited to, iron, folic acid, vitamin D, and vitamin B12 [7,8,12,18]. Furthermore, follow up should include measurement of celiac serologist (quantitative determination of anti-tTG IgA and anti-DGP IgA) and a thorough review of the patient's diet [7-9,18].

Nutritional Management of Non-Celiac Gluten Sensitivity

As with CD, the treatment for NCGS is to follow gluten free diet [19,20]. The symptoms will improve when the gluten is taken away from the diet and thus also reinforces the diagnosis. However, it has been suggested that NCGS may be a transient condition therefore there are uncertainties with regards to the recommendations of how long the diet should be followed for and to what strict extent [16,20]. It has been suggested, the gluten free diet can be followed within a specific time frame for example 12-24 months, before reviewing gluten tolerance again by following a guided re-introduction of gluten into the diet [20]. However, based on severity of symptoms some patients with NCGS may decide upon following a gluten free diet indefinitely despite not having CD [20]. Specialist dietetic care is a crucial element of care for patients diagnosed with NCGS as with CD for the previously discussed reasons above [20].

There are currently no clear guidelines on standardised follow up for NCGS cases but it is expected that initiation of the gluten free diet will result in resolution of symptoms [20]. Hence, follow up is

important in these patients to confirm improvement in symptoms. Moreover, it is good clinical practice to embed periodic follow up like in CD except for serology due to absence of valid bio markers, these patients will also be following a gluten free diet for a given amount of time and could potentially be at risk of nutritional deficiencies as well as facing difficulties in adherence. The degree of 'strictness' at which the gluten free diet is followed at should also be a subject of discussion upon each review; as in some patients it may be possible to follow a less restrictive diet without the onset of symptoms [2,19,20].

Nutritional Management in Wheat Allergy

The complete elimination of wheat containing products is required to treat Wheat Allergy through cutaneous, gastrointestinal and respiratory routes [16,21]. Patients who result in suffering from an anaphylactic reaction after consuming wheat containing foods should consider permanent dietary elimination [16]. In practice; patients with Wheat Allergy should be under the care of a specialist Dietitian as with CD and NCGS due to the vast use of wheat in many processed foods. It is important for patients to receive appropriate tailored dietary counseling to support them through interpreting food labels, choosing naturally wheat-free grains as well as guidance during social instances. Unfortunately, opting for only naturally wheat free foods may decrease both variety and nutritional adequacy of the diet as well as impacting quality of life [16].

A tailored, individualized plan should be created for a patient to minimize the risk of nutritional deficiencies and optimize adherence with the support of a specialist Dietitian/ allergy specialist and the following factors should be taken into consideration [16,22].

- Severity of past reactions
- Amount of wheat reacted to in the past
- Co-existing asthma
- Severity of other food allergies

Conclusion

Gluten related disorders are overlapping in their presentation with subtle differences to diagnose each disease separately. Celiac disease and Non-Celiac Gluten Sensitivity are both chronic conditions which are treated with a gluten-free diet, which is strict and throughout life in CD but can be individualized in NCGS. Strict dietary exclusions are associated with the treatment of Wheat allergy. It is important to be able to distinguish between all three conditions for long-term therapy. A close

monitoring of nutritional status, macro and micronutrient deficiencies monitoring and personalized patient education should be implemented throughout the course of treatment.

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