



Celiac disease: the clinical chameleon

Editorial by Carlo Catassi

The chameleon is a well-known African reptile famous for its ability to change the color of its skin in order to blend in with its surroundings. In medicine, the term “chameleon-like” is used to describe diseases which can appear in many different forms. Celiac disease, with its diverse, ever-changing nature, is one such disease.

The **typical intestinal form of celiac disease**, which normally affects young children and is characterized by chronic diarrhea, loss of appetite, stunted growth and a bloated stomach, has long been known and is the easiest form to recognize. However, the increasing use of laboratory-based analyses such as anti-transglutaminase antibodies that enable diagnosis of celiac disease using just a simple blood sample, has revealed many **other previously unknown forms of celiac disease**. Atypical or non-classic symptoms resulting from such forms of the disease include a short stature, delayed onset of puberty, hepatitis, anemia through lack of iron (particularly in cases where patients do not react to oral iron treatment), chronic fatigue,

frequent stomach pain and recurrent aphthous stomatitis. There are also **“silent” forms of celiac disease** – cases where individuals suffering no apparent symptoms are diagnosed by chance, for example as the result of a screening of family members of a child suffering from celiac disease.

Could this wide range of presentation mean that there are also differences regarding the intensity and complication risks of the disease? Generally, the answer is no. All cases of celiac disease – typical, atypical or silent – show the same autoimmune changes in the blood (antibodies) and the same type of damage to the intestinal mucosa in biopsies. The complication risk also remains the same since it is known that **untreated silent forms of celiac disease can cause complications such as osteoporosis, neurological conditions or immunity to dietary treatments** (a subject addressed in another article in this edition). Therefore, despite the chameleon-like nature of celiac disease, the dietary treatment should always be the same, i.e. a strictly gluten-free diet.

However, it remains to be determined **which strategy is the best for recognizing all forms of celiac disease**, including those which are most abstract from a clinical perspective. Until now it had always been assumed that “case finding” was the best solution, i.e. using symptoms or side effects to identify sufferers within groups of individuals at risk. Yet, recent data show that this method is only successful in diagnosing 30% of cases, while the remaining 70% remain undiagnosed and therefore continue to expose these individuals to the risk of complications. It is for this reason that an increasing number of experts are in favor of carrying out a general screening of the population during childhood. Today, **this approach is not only feasible but could in fact be simplified using a “pre-screening filter” based on research into genetic predisposition for celiac disease**. This would make it possible to take blood samples only from those children who show a genetic predisposition for the disease. This innovative diagnostic strategy would finally make it possible to recognize the chameleon-like celiac disease even when it changes its appearance.



A Global Map of Celiac Disease

This article focuses on the varying frequency of celiac disease in “time and space”. The information it contains is not only relevant for statistical purposes but also serves to formulate hypotheses on the factors which contribute to the development of this disease that is so widespread in modern society.



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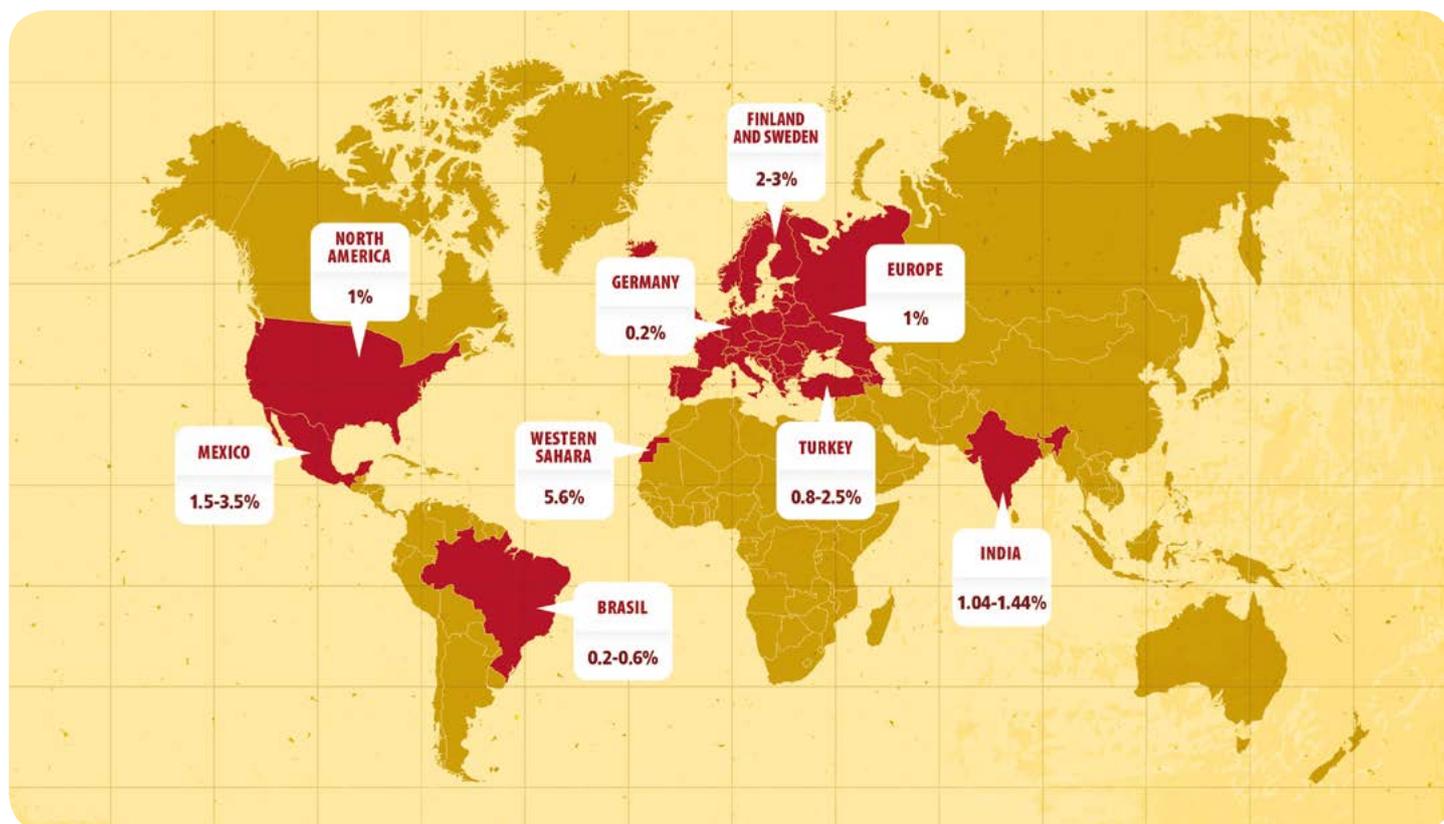
The development of simple but reliable diagnostic methods making it possible to analyse the frequency of celiac disease in different cultures and regions has given a major boost to epidemiological research in this field. These methods – including the detection of anti-gliadin antibodies, anti-transglutaminase antibodies and anti-endomysial antibodies as well as the HLA test for genetic predisposition – require just a few drops of blood, which can also be analysed elsewhere (if, as is the case in some developing countries, the necessary laboratory equipment is not available on site). This international research has resulted in an interesting global map of celiac disease which we will now look at in a little more detail.

Celiac disease used to be considered a rare disease limited almost exclusively to the region of Europe and the age group of children. However, the first comprehensive tests, launched in the 1980s, have revealed a very different reality. **Celiac disease is one of the most frequent of all lifelong diseases**, affects children and adults in equal measure and is more common

in women (ratio men/women = 1:1.5-2). In Italy and generally in Europe where a great deal of research on celiac disease has been conducted there are variations in the rate of prevalence in the different countries. This can also be seen in the Americas, where the rate is only .2 to .6% in Brazil but 1.5-3.5% in Mexico 3.5% in Mexico. As the genetic differences between these populations are very small, it can be assumed that these fluctuations in frequency are the result of still relatively unknown environmental factors such as child nutrition, intestinal infections and the typology of intestinal flora (known as “microbiome”). Other countries with populations of primarily European descent – such as the United States, Australia and Argentina – have also shown an average frequency of 1%.

Another worrying fact revealed by epidemiological research is that **frequency of celiac disease is still on the rise in the West**. In the United States, for example, the frequency has increased over the last 40 years from 2 cases per thousand to 10 cases per thousand (1%). This

It is assumed that environmental factors are the reason for variations between the countries; such as child nutrition, intestinal infections and the type of intestinal flora.



Sketch of a new epidemiology of celiac disease, characterized by growth in the traditional fields and spread into new regions of the world

alarming fact also indicates that environmental factors, such as the spread of ever more “toxic” cereals and shorter proving times for bread dough, play a decisive role.

At the same time as this epidemiological research was being carried out, the concept of the “celiac iceberg” developed. This means that, despite an ongoing rise in diagnosed cases, the number of celiac sufferers diagnosed through their symptoms is still a long way below previous estimates of the total prevalence. **Approximately 70-80% of all cases remain undiagnosed** (representing the section of the iceberg below the water’s surface), in particular as sufferers show either ambiguous symptoms or no symptoms at all. In such situations there

is a risk that patients may later suffer from complications as a result of not receiving dietary treatment for the disease.

In developing countries the epidemiological reality is far more concerning than in the Western world. First and foremost, the myth that celiac disease primarily affects Europeans has been debunked: research indicates that the frequency of the disease in North Africa, the Middle East and India is the same (around 1%) as in Europe. Indeed, in one African people – the Sahrawi from the Western Sahara – celiac disease was shown to have an endemic presence of 6-7% among children. The reasons for such a high frequency are unknown; however, it is believed that this specific situation

may have been caused by a sudden change in the Sahrawi’s eating habits that saw them switch from a diet of mainly camel milk and camel meat to more European eating habits, including a drastic increase in their consumption of cereal products, as a result of Spanish colonisation. In developing countries, non-diagnosed cases of celiac disease can cause severe forms of protein-calorie malnutrition, which in turn increases the risk of other diseases and infant mortality. The lack of awareness among doctors about celiac disease and the limited availability of diagnostic tests mean that the diagnosed cases of the disease represent only a fraction of the total number of people affected. In India, for example, it is estimated that, as well as the few thousand diagnosed cases, there are between 5 and 10 million further celiac sufferers (a “celiac iceberg” that lies almost entirely below the water’s surface).

A similar frequency (about 1%) to Europe, was also found among the populations of North Africa, the Near East and India.

Considering this situation, it seems right to ask which strategy represents the most effective way of bringing such undiagnosed cases “to the surface”. So far, the strategy most commonly

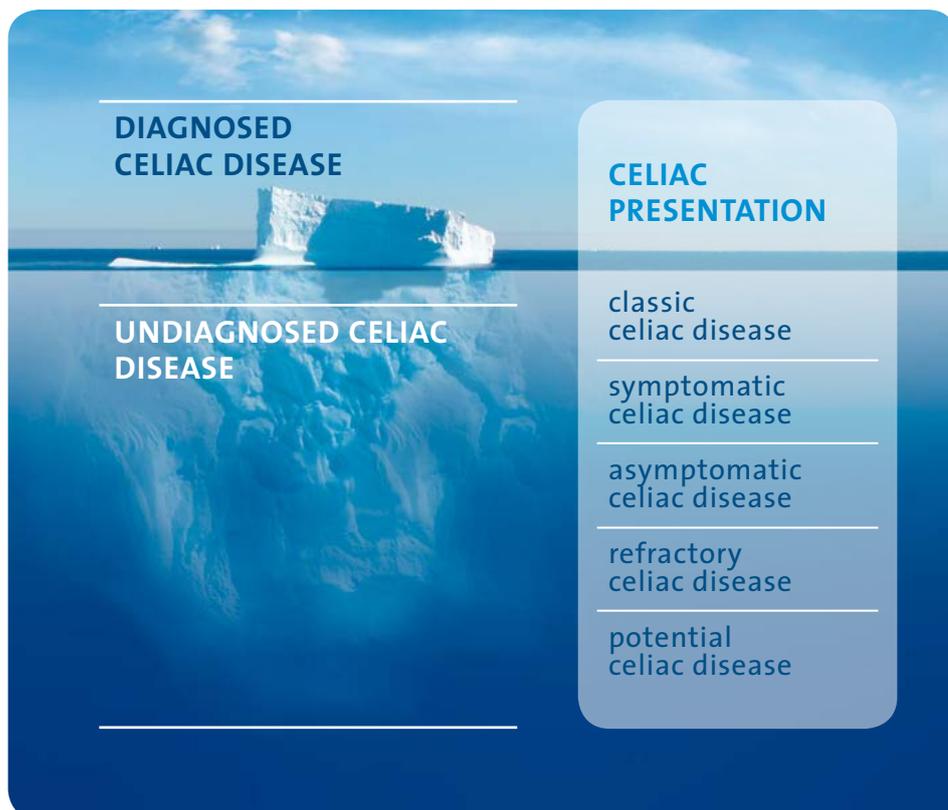
The concept of “Comprehensive” screening began to predominate.



recommended has been to use the diagnostic tests on all persons who are “at risk”, for example relatives of individuals with celiac disease as well as individuals with autoimmune diseases or with symptoms that may indicate the presence of celiac disease (stunted growth, persistent intestinal problems, anaemia, etc.). This low-cost strategy, known as “case-finding”, can be justified from both an ethical and a financial point of view, but it is not particularly effective and diagnoses no more than 30% of cases. Therefore, “universal” screening is gain-

ing ground. In this case, blood tests are carried out on all children when they reach the age of compulsory education (6 years) in order to determine the presence of celiac antibodies. The effectiveness of this strategy may be linked to the fact that the child’s genetic predisposition is already assessed at birth (the HLA test, like other screening methods used on newborns, requires just a drop of blood), so antibody tests are carried out only on those children who tested positive for a genetic predisposition to the disease at birth.

In conclusion, it can be confirmed that the global map of celiac disease is far more densely “populated” than previously assumed. Health authorities both in the Western world and in developing countries must pay serious attention to this situation. Epidemiological research into celiac disease contributes to identifying the environmental factors that may be responsible for fluctuations in frequency. **In practice, it is necessary to raise awareness of this “chameleon-like” disease** as well as to develop possible mass screening strategies in order to bring the celiac iceberg, i.e. the many undiagnosed cases, as far as possible towards the surface.



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Analysis of dietary patterns in people with and without celiac disease

How balanced is the diet of celiac disease patients? In this article, Nicoletta Pellegrini explores this topic in her current study

A gluten-free diet eliminating all foods containing gluten and replacing them with products made using gluten-free grains is considered the only way to treat celiac disease. Adhering to a gluten-free diet allows for remission of symptoms and enables the patient to return to good health. The scientific community has questioned the nutritional adequacy of the diet. A number of studies carried out over the past ten years have shown – albeit with sometimes contradictory results – that individuals with celiac disease do not consume the recommended amounts of certain nutrients. Most studies indicate that individuals with celiac disease consume less than the recommended amount of complex carbohydrates, fiber, folate, calcium and iron, but more than the recommended amount of proteins and energy from total fats and saturated fats. Therefore, it can be speculated that in the long term a gluten-free diet is not a balanced diet. To investigate this further a study

is being conducted in collaboration with the Center for Prevention and Diagnosis of Celiac Disease at the University of Milan. The population group consists of **300 individuals (150 individuals with celiac and 150 non-celiac)**. These volunteers were selected according to a series of inclusion criteria, including age (between 18 and 70 years), a routine dietary pattern (for those with celiac disease dietary adherence for the past two years was required), as well as the absence of metabolic diseases, chronic diseases, certain psychological conditions and other special diets. **Two research methods were chosen to determine the participants' eating habits: a diary** in which each participant lists all the food and beverages consumed during one week and a **food frequency questionnaire**. The diary provides detailed information about eating habits, but it is limited to the food and beverage consumed during just one week. Therefore, it is not a comprehensive description of a person's general eating habits. The food frequency questionnaire, on the other hand, gives a more general insight into the person's eating habits throughout the previous year, albeit in a less detailed manner. Using both methods makes it possible to gather fuller complementary information. The preliminary results of the study suggest that patients with celiac disease consume a higher proportion of calories through fats, in particular saturated fats. They also consume a higher proportion of sodium compared to the control group. These increases can be contributed to the reported higher consumption of sweets. Only a small proportion of individuals with celiac disease consume appropriate amounts of calcium, iron, folate and fiber.



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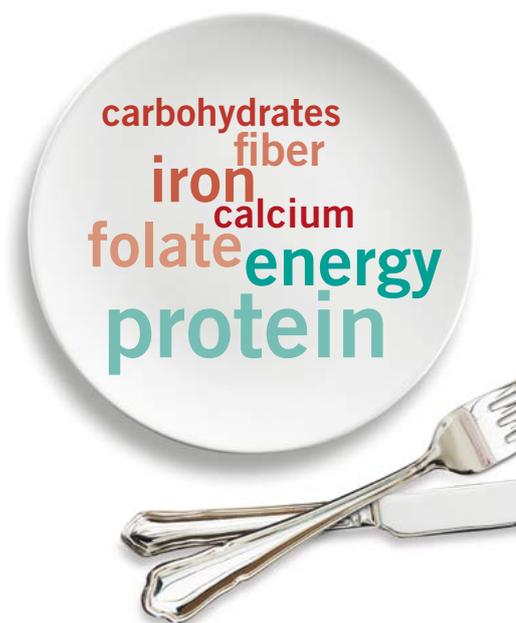
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It is believed that long term use of the gluten-free diet is associated with nutritional imbalances.

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Food Frequency Questionnaire

Food Frequency Questionnaire
The questionnaire collects information on food consumption patterns during the past year. There are 148 food items. For each item the average intake (predetermined portions) and the consumption frequency (1-6 times per day, week, month or year) are queried. Color photographs simplify the determination of portion sizes of food items that are not in usual household measures.





The food frequency questionnaire that was developed was analysed with the intent to expand our study to further test centers in Italy and gather information about a broader group of individuals with celiac disease. At the conclusion of the study more detailed information on the study groups' intake, the nutritional content, and dietary patterns will be revealed and this information can then be used to improve the eating habits of individuals with celiac disease.

A presentation on this study is on the the Dr. Schär Institute webpage (<http://www.drschaer-institute.com/us/clinical-areas/ceeliac-disease/clinical-library/webinars-and-presentations/>). We will keep you up to date on the latest study results in our upcoming newsletters.



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A large number of our products for daily use, such as bread, are rich in fibre, which plays a particularly important role in gluten-free nutrition. Our products have a significantly reduced salt content. This is in line with recommendations from the field of nutritional science and consumer protection requirements for the benefit of the health of our consumers. We are constantly reducing the sugar content of our range of sweet products and never use any chemical or artificial sweeteners.

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Dietary compliance and the gluten-free diet

Adherence to the gluten-free diet is not always easy. There are various factors that influence the dietary behavior of individuals with celiac disease.

Introduction

The only treatment for celiac disease is a gluten-free diet for life. The gluten-free diet has evolved from the historic banana diet, a diet of exclusion, to one including many naturally gluten-free foods as well as many manufactured gluten-free products. However, it must also be recognized that eating encompasses more than just meeting one's physiologic need for nutrients. It is often interwoven into the fabric of our lives, culture, social, and emotional needs. The overall implication of the quality of life studies is the recognition of the difficulty in dietary compliance especially in social situations in a disorder where the only treatment is strict lifelong dietary compliance. The reasons for noncompliance may be as multifaceted as the consequences.

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The "banana diet" was thought to be the only treatment for children with celiac disease for many years. Actually Dr Samuel Gee was the one who promoted its use back in the 1880's. The children were fed bananas, rice and cream. Because the diet excluded gluten – the children got better. Dr Fasano and Dr Guandalini often refer to the "banana diet" as part of the history of celiac disease.

Gluten-free diet and quality of life

Several studies have described the interrelationship between the rigid nature of the gluten-free diet, dietary compliance and quality of life scores.^{1,2,3,4,5,6} Several of the studies describe increased anxiety associated with

social occasions.^{7,8} In the Gray study 74% of the study population (n=788) reported anxiety and depression compared to only 50% before diagnosis.⁷ The fear and anxiety are often associated with socializing with friends, being different, fear of contamination of one's food.^{2,6,9} In the studies by Lee, et al^{3,1} the areas of dining out, travel, social interaction, and work are most negatively affected, similarly to the European studies. However, in contrast to the European studies there was no significant difference between genders.¹⁰

Similar negative impact on the social domain of quality of life was reported by Cranney et al.³ Cranney found that 81% of respondents avoided restaurants, 38% avoided travel, and 91% brought their own gluten-free food with them when traveling due to the difficulties of maintaining a gluten-free diet.³ The emotional and social burden of the diet was reported as the reason for avoidance of social activities in another study² highlighting the pervasive negative effect of the diet on an individual's life.

Compliance issues

Multiple studies have reported on dietary compliance in celiac disease^{11,12,13,14,9,4,15,7} In a study comparing British residents of South Asian and Caucasian ethnic background, the South Asians were less compliant to their gluten-free dietary regime.¹⁶ The South Asian patients were less likely to attend dietetic clinics, join a celiac support group, and be satisfied with information provided by doctors and dietitians.¹⁶



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Age plays a role in the compliance with the diet. Only 4% under-35-year-olds indicate they followed the diet strictly.

Only 45.5% of African-American patients with biopsy proven celiac disease reported strict adherence to the gluten free diet in a recent study in the United States.¹⁷

Studies have also shown age to be associated with dietary compliance.² In the Barratt study of celiac patients in the UK, only 4% of those under age 35 reported full adherence and 12% of the under 35 group reported partial adherence² compared to those over 36 years of age in the same study population. The reasons for non compliance were difficulty following the diet while eating out, socializing and personal relationships. Marriage or gender were not determining factors in compliance.²

In a study of 123 adolescents with celiac disease 65% reported being compliant with a strict gluten-free diet, 23.6% reported following a wheat based (non gluten-free diet) despite a prescribed gluten-free diet and 11.4% reported occasional intake of wheat based foods.¹¹ The adolescents reported they were fully aware of their indiscretions and that they abandoned the diet to avoid difficulties in social situations.¹¹ Those not on a gluten-free diet reported more symptoms than the other two groups. Antibody levels were elevated in all three groups with the highest level 27.5 for those not consuming a gluten-free diet and 18.7 and 14.2 for those on a strict gluten-free and semi strict gluten-free diet respectfully. The elevated antibody levels correlate with villous changes on the subjects' intestinal biopsies.¹¹

Green found that individuals would “intentionally cheat” on the diet in social situations, dining out, parties, and other functions outside of the home. Only 68% of individuals reported following the diet “all the time” and 30% reported following the diet “most of the time”.¹⁸ Although this adherence rate may be viewed as positive amongst other diet regimes the consequence of non-adherence for the individual with celiac disease are grave. There are increased risks of infertility, peripheral neuropathies, bone loss, lymphomas, and cancers of the small bowel and esophagus.¹⁹

Similar findings were reported in a survey of adolescents.⁶ The self report compliance ratings were then compared to the adolescent's antibody level and intestinal biopsy reports. The reported non compliant group had various degrees of intestinal damage and mucosal abnormalities. Interestingly, those who reported strict adherence to the gluten-free diet also showed signs of mucosal abnormalities.⁶ Ciacci's conclusion was that even those who report being on a strict gluten-free diet may not really be strict.

In a subsequent study it was found that the degree of perceived dietary compliance was in sharp contrast to the actual compliance.¹ When a sample of 50 individuals with celiac disease were queried in general how compliant they were, both males and females responded with a high degree of compliance (98%). However when furthered queried as to specifically when or where they would ingest gluten both genders reported high dietary indiscretion. Eighty one percent of males reported intentionally ingesting gluten at social activities, at restaurants (82%), and with friends (58%). Females reported higher dietary indiscretion rates than did males. **Eighty eight percent of females reported dietary indiscretion at social activities and at restaurants, and 67% with friends.**¹

Conclusion

These studies highlight the need for further research into the area of noncompliance on the gluten-free diet. As many of the noncompliance issues involve the area of the social domain of quality of life studies investigating methods to diminish the feelings of isolation and enhance the feelings of inclusion, acceptance, and normalcy of the dietary restriction are warranted.

Practice Tips

As compliance to the gluten-free diet is the cornerstone of therapy for individuals with gluten-related disorders it is important to provide concrete solutions for their everyday lives. Here are a few suggestions based on the latest research.

- ✓ Provide the client with the name and contact number of the local support group. Face to face support is associated with higher compliance, increased feelings of empowerment, and decreased feelings of isolation.
- ✓ Provide educational materials to meet the clients' immediate needs. The materials may need to be broken down into survival

skills (which foods are gluten-free and what to avoid, where to find the foods locally), day to day coping (label reading, recipes etc) and longer term coping strategies (dining out and travel).

- ✓ Allow for time during follow up visits, to inquire about the clients adjustment to the gluten-free diet and lifestyle.
- ✓ Encourage the clients family to attend follow up visits, this provides an opportunity to discuss lifestyle adjustment.
- ✓ Encourage use of support groups, social workers, or family counseling for any clients that appear to be struggling with the diet and/or compliance.

INFO

The Dr. Schär Institute has many resources available for you and your patients about celiac disease and gluten sensitivity.

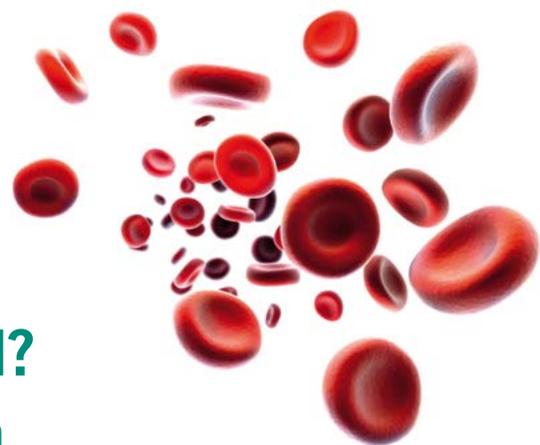
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What is refractory celiac disease and how is it diagnosed? An insight into current research



Celiac disease can be divided into different types. This article describes refractory celiac disease, the diagnostic process and new testing procedures.



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Background

In most cases, celiac disease can be treated successfully using a gluten-free diet. However, a very small proportion of sufferers (around 0.5%) develop refractory celiac disease, meaning that they suffer from celiac-like symptoms despite adhering to a strict gluten-free diet. It is important that refractory celiac disease is diagnosed since it can result in serious secondary diseases (for example, lymphoma diseases, i.e. malignant diseases affecting certain inflammatory cells). Current techniques used to diagnose refractory celiac disease are complex and comprise analyses of the patient's cells and genetic material (deoxyribonucleic acid, DNA) using tissue extracted via a gastroscopy. These measures aim to identify whether patients who are believed to be suffering from refractory celiac disease are among those also at risk of developing T-cell lymphoma (type II refractory celiac disease), or whether they are suffering from the less serious type I refractory celiac disease. **Patients suffering from type II refractory celiac disease must be closely monitored and in some cases require medication.** One positive aspect worth mentioning is that the therapy methods developed in recent years, primarily in the Netherlands, to treat the more serious form of refractory celiac disease (type II) represent a clear improvement. Indeed, such improvements in treatment are the reason why it is so important to differentiate between type I and type

II as early as possible. However, current diagnostic procedures do not enable a reliable differentiation between these two subtypes in a number of patients. That is why we have decided to focus our research work in Berlin on improving diagnostic techniques in this field using two newly developed testing methods. These will be used on patients suffering from refractory celiac disease type I and type II with the aim of contributing to a reliable diagnosis. Moreover, the results of these tests will be checked against the progression of the disease in the respective patients. We have reason to believe that these new diagnostic tests can reveal information about the future progression of the disease – a valuable contribution that no diagnostic method currently in use is able to deliver.

What kind of tests will be used?

The current diagnostic technique involves subjecting certain cells contained in tissue taken from the small intestine via a gastroscopy to immunostaining and then analyzing these cells under a microscope. In addition, the patient's DNA is checked for changes in the T-cell receptor using a process known as molecular pathology. The T-cell receptor is a key molecule that sits on the surface of certain inflammatory cells (the T-cells) and plays a central role in the body's immune response to pathogens. It is only capable of carrying out





this role if there are several million different versions of this molecule which, in turn, are capable of identifying a huge variety of bacteria, viruses and parasites. In patients suffering from type II refractory celiac disease, a certain T-cell multiplies so many times that it is identified as a clone by current testing methods. However, in many cases these testing methods are unable to provide a clear result, meaning the doctor cannot be certain whether or not the patient is suffering from the severe form of celiac disease. This is where the new testing methods are designed to make a difference. The first of these methods, the **FACS analysis of T-cells from the intestine**, removes the inflammatory cells from the tissue and dyes them in a very specific way using antibodies. The antibody binding of tens of thousands of individual cells is then analyzed using a FACS machine (Fluorescent Activated Cell Sorter), which makes it possible to quantify the proportion of “diseased”, or “aberrant”, T-cells. This can be carried out both before and after therapy. According to our theory, the number of aberrant T-cells can be used to determine the patient’s condition during the progression of the disease, i.e. to assess how successful therapy has been. We still have to evaluate to what extent the number of aberrant T-cells at the start can be used to indicate the initial severity of the disease. The second testing method, **deep sequencing of T-cell receptors**, analyzes the patient’s DNA in a similar way to the molecular pathology technique already used. The

difference, however, is that the analyses carried out are significantly more detailed than those used in molecular pathology, as the important part of the T-cell receptor is “sequenced”, i.e. the exact order of the DNA bases is analyzed. Yet, as there is an enormous number of different T-cell receptor variants, this process must be repeated millions of times – a Herculean task possible today thanks to modern DNA sequencing machines. It is this large number of repetitions that gives “deep” sequencing its name. As with the other new testing method mentioned above, the number of repeating T-cell receptor sequences revealed through this technique can indicate the presence of “T-cell clones” – even, we believe, at an early stage when these clones are still in their infancy.

As may be clear from the descriptions above, these new tests place no additional strain on the patient. Both the existing and the new testing methods require tissue samples taken from the duodenum, the first section of the small intestine. The new testing methods could, however, enable better differentiation between the two different types of refractory celiac disease. Consequently, doctors could know for sure whether or not treatment is required, and could evaluate the success of this treatment by analyzing those cells placed under attack by the treatment. The result is an optimization of the diagnostic process and a more targeted treatment, resulting in a significant benefit for the patient.

INFO**DEFINITION OF REFRACTORY CD**

Refractory celiac disease is present, if there is evidence of new or persistent villous atrophy, despite strict gluten-free diet for 12 months and intestinal or extraintestinal symptoms persist or recur.

News

3rd International Expert Meeting on Non-Coeliac Gluten Sensitivity

Dr. Schär brought 36 international experts together in picturesque Salerno to discuss “The diagnostic path from diagnosis of exclusion to the positive diagnosis”. The 3rd International Meeting on Gluten Sensitivity took place from 5 - 7 October in Salerno. The positive results of the previous meetings in London (2011) and Munich (2012) prompted another encounter, at which experts from different

countries and disciplines exchanged experiences and revealed new scientific findings and opportunities. The focus of this meeting was to explore the current status of studies and identify opportunities, as well as to incorporate and simplify diagnostic criteria. The meeting was chaired by Prof. Carlo Catassi and Prof. Alessio Fasano, with assistance from the newest committee member, Dr. Luca Elli.

Gluten Related Disorder Webinar with Dr Fasano is a great success.

On Nov 5th Dr Schar USA in conjunction with NASPGHAN and Today's Dietitian Learning Library presented a one credit webinar. Dr Alessio Fasano and Pam Cureton presented the latest research findings in the session titled Navigating the spectrum of gluten

related disorders: Examining 3 cases; Celiac disease, Gluten sensitivity, and Wheat allergy. The recorded session and continuing education credit is available for free, just click on the link

www.ce.todaysdietitian.com/node/28560

Recent studies on www.drschaer-institute.com

STUDIES

- [Causes of death in people with coeliac disease in England compared with the general population: a competing risk analysis](#) 24.10.2014
- [Glycaemic index of some commercial gluten-free foods](#) 17.10.2014
- [Randomized Feeding Intervention in Infants at High Risk for Celiac Disease](#) 02.07.2014
- [Introduction of Gluten, HLA Status, and the Risk of Celiac Disease in Children](#) 02.10.2014
- [The New Epidemiology of Celiac Disease](#) 27.07.2014
- [Celiac Disease: Ten Things That Every Gastroenterologist Should Know](#) 19.07.2014
- [Risk of pediatric celiac disease according to HLA haplotype and country](#) 03.07.2014
- [Coeliac disease: The debate on coeliac disease screening – are we there yet?](#) 01.07.2014
- [Cognitive impairment in coeliac disease improves on a gluten-free diet and correlates with histological and serological indices of disease severity](#) 01.07.2014
- [Early nutrition: prevention of celiac disease?](#) 01.07.2014

Professional Resources
at your fingertips

Dr Schar Institute has all the information you need to help care for your patients. The virtual Institute has recaps and links to the latest research on gluten related disorders as well as educational materials for you to download for your patients. Click on the link below to access the information and resources.

US Marketing and Professional
Team shares the love this summer.

Dr Schar USA teamed up with 15 summer camps to provide gluten free breads, rolls, pasta, and cookies to over 2000 campers across the country. Many campers were able to enjoy gluten-free S'mores and hot dogs on buns for the first time.



Dr Schär

EDITOR

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