

Should You Be Gluten Free?

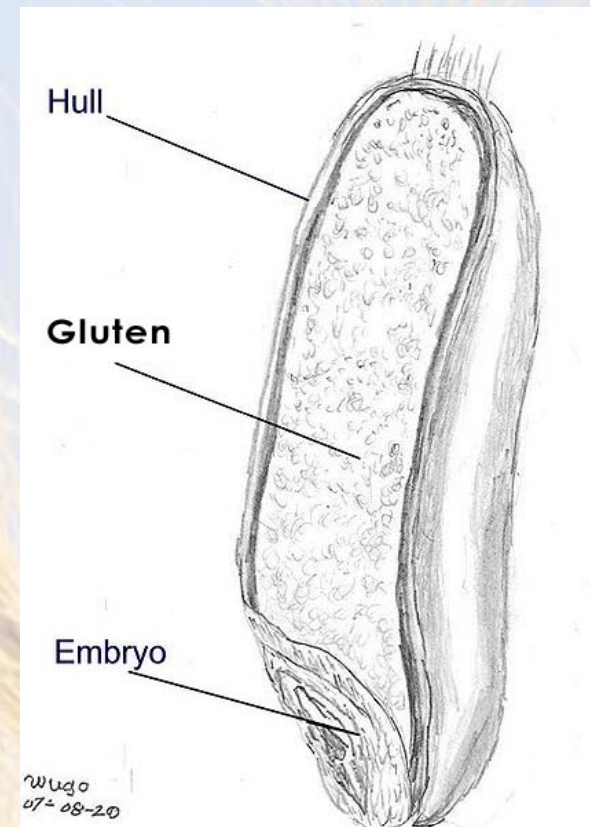
New Research Shows 1 in 8 Americans
are Gluten Intolerant ...*Are You?*

- What is gluten?
- Latest research
- Testing
- How to Live Gluten Free

Presented by Dr. Kevin Unterreiner, B.S., D.C.

What is Gluten?

- A protein found in wheat, rye, barley and some oats
- Gives dough elasticity and strength
- Used as a filler and as a binder in prepackaged foods
- Formed by the combination of the proteins gliadin & glutenin



What Foods Contain Gluten?

- Flour products (eg. breads, pastas)
- Some oats (gluten free oats are available)
- Some lunch meats
- Some sports drinks
- Beer (except Redbridge beer by Budweiser)
- MSG
- Some teas
- Cereals (unless gluten free)
- Soy sauce (unless gluten free)
- Food additives (flavorings, malt)
- Gravies
- Modified food starch can contain gluten



Gluten Free Foods

- Fresh meats, fish, and poultry (unless breaded or marinated)
- Most dairy products (although many gluten-sensitive individuals are also sensitive to casein...a dairy protein)
- Gluten-free flours (rice, soy, corn, potato)
- Fruits
- Vegetables
- Rice
- Potatoes



Allergy vs. Intolerance vs. Sensitivity

- **Food Allergy:** an adverse immune response to a food protein. Involves a physiological reaction and adversely affects the immune system
- **Food Intolerance:** an adverse reaction of the body that usually causes symptoms but does not involve the immune system (eg. lactose intolerance)
- **Food sensitivity:** a negative reaction to a food, beverage or additive. Usually a delayed response but often symptomless. Effects are cumulative (harmful after years of exposure)

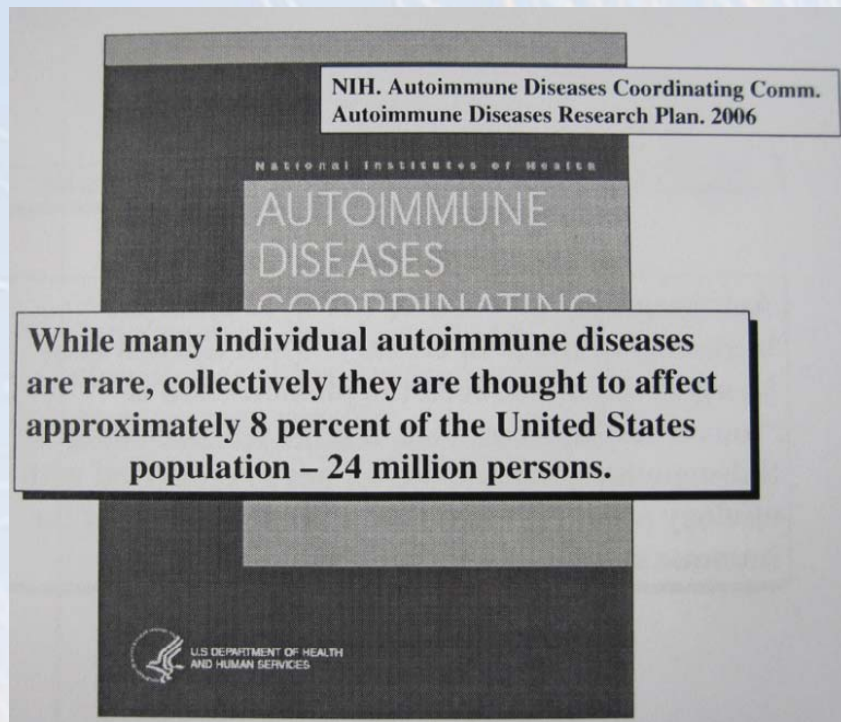
Understanding Function

100% Function	Normal	No symptoms
80% Function	Sensitivity	Symptoms unlikely
60% Function	Sensitivity/Intolerance	Minor Symptoms
40% Function	Intolerance	Major Symptoms
20% Function	Allergy	Disease/ Pathology

Symptom free does not mean optimal function

How Many People are Gluten Intolerant?

- 1 in 8 are thought to be gluten intolerant (39 million Americans)
- 77% produce antibodies in response to gluten (231 million Americans)
- 8% have an autoimmune disease (24 million)

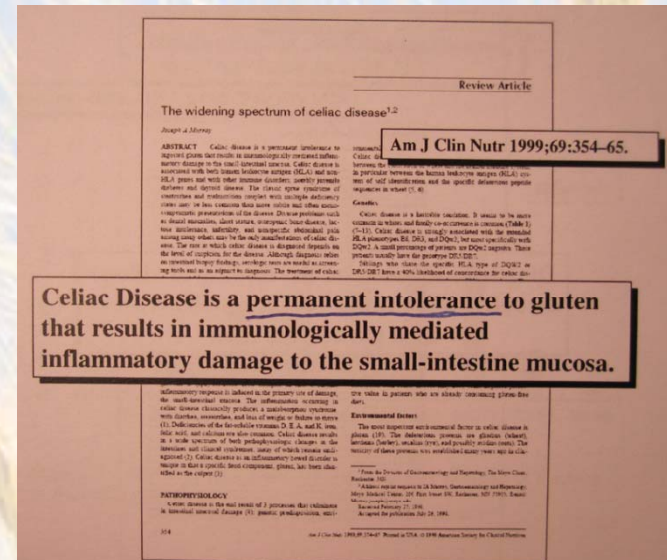
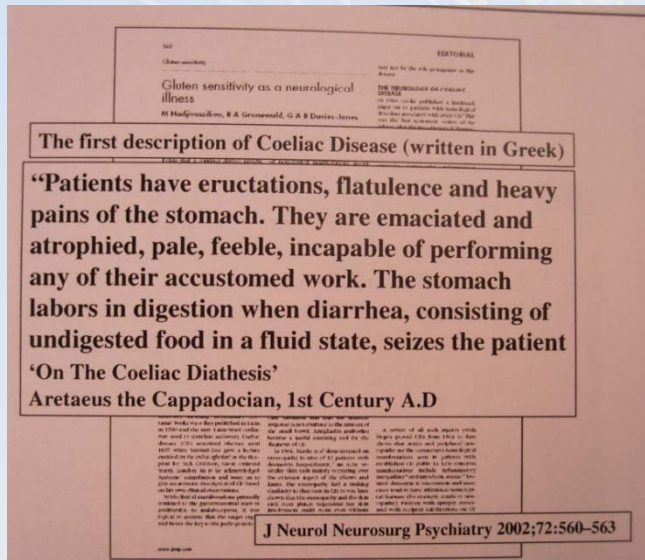


What is Celiac Disease?

- “Celiac disease is a problem some people have with foods that contain gluten. Gluten is a kind of protein found in foods like bread, crackers, and pasta. With celiac disease, your immune system attacks the gluten and harms your small intestine.”

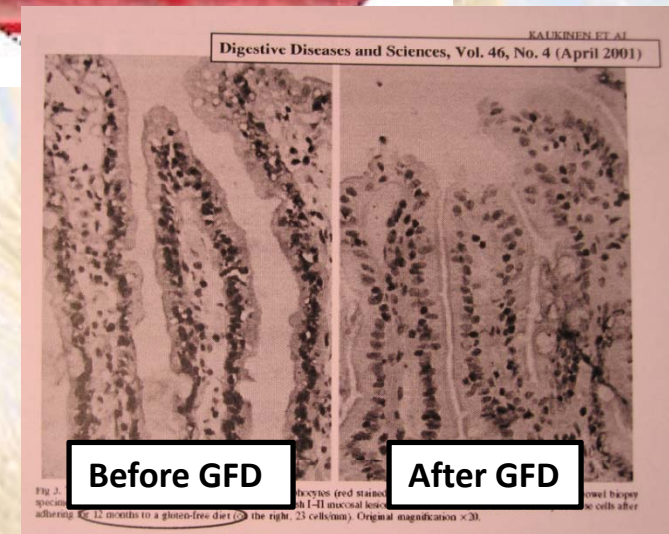
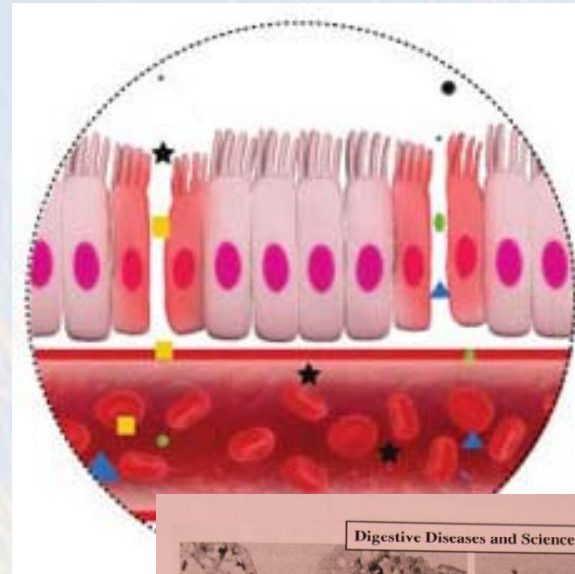
- WebMD

- Diagnosed by blood tests (show gluten antibodies), endoscopy or biopsy



What Happens if You're Gluten Intolerant?

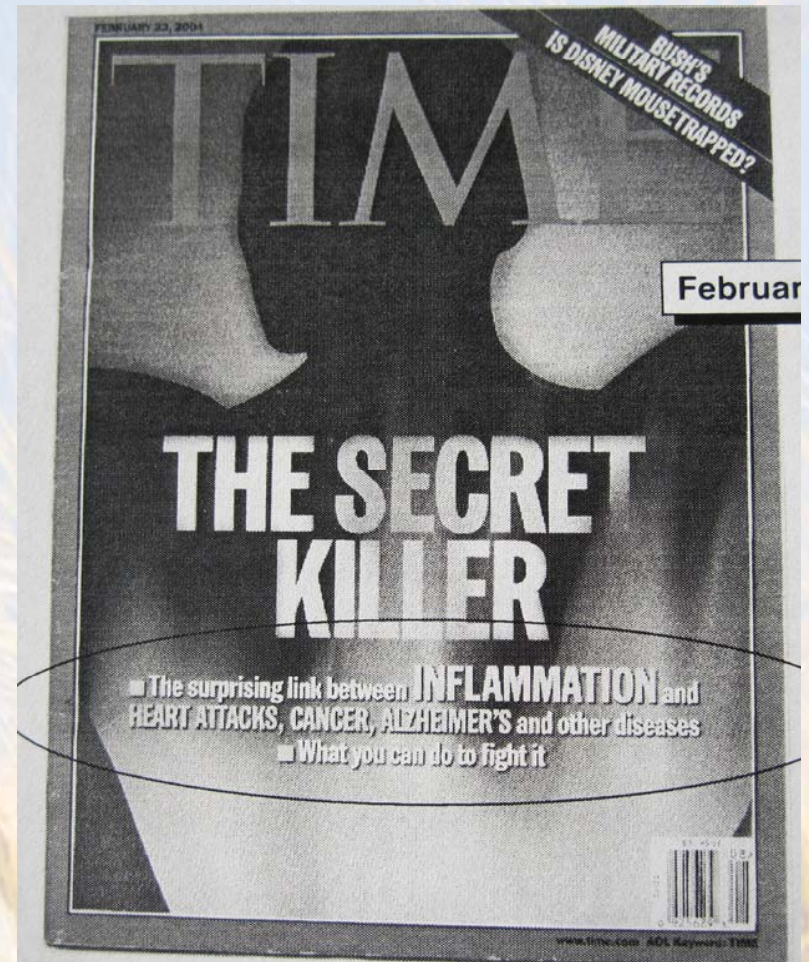
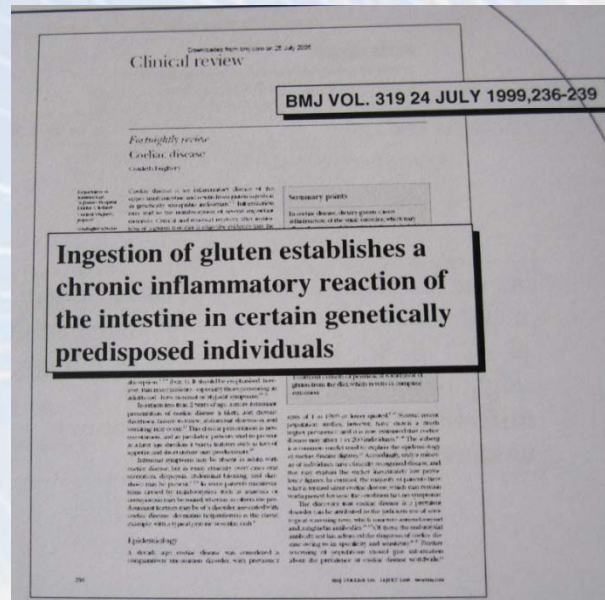
- Gluten intolerant individuals produce antibodies in response to gluten causing inflammation and intestinal damage over time
- Can lead to “leaky gut” which allows larger particles in the food we eat to enter bloodstream resulting in the body producing more antibodies hence more inflammation
- For those with a lot of sensitivities, suspect leaky gut. Healing the intestinal lining decreases permeability and reduces sensitivities
- A study of 30 adults found that a gluten free diet (GFD) resulted in healed intestinal lining (Aliment Parmacol Ther 2002; 16:1333-39)



Inflammation – The Common Link?

Researches are finding that inflammation is a common link present in most major diseases including:

- Heart disease
- Cancer
- Memory disorders
- Diabetes
- Thyroid
- Arthritis



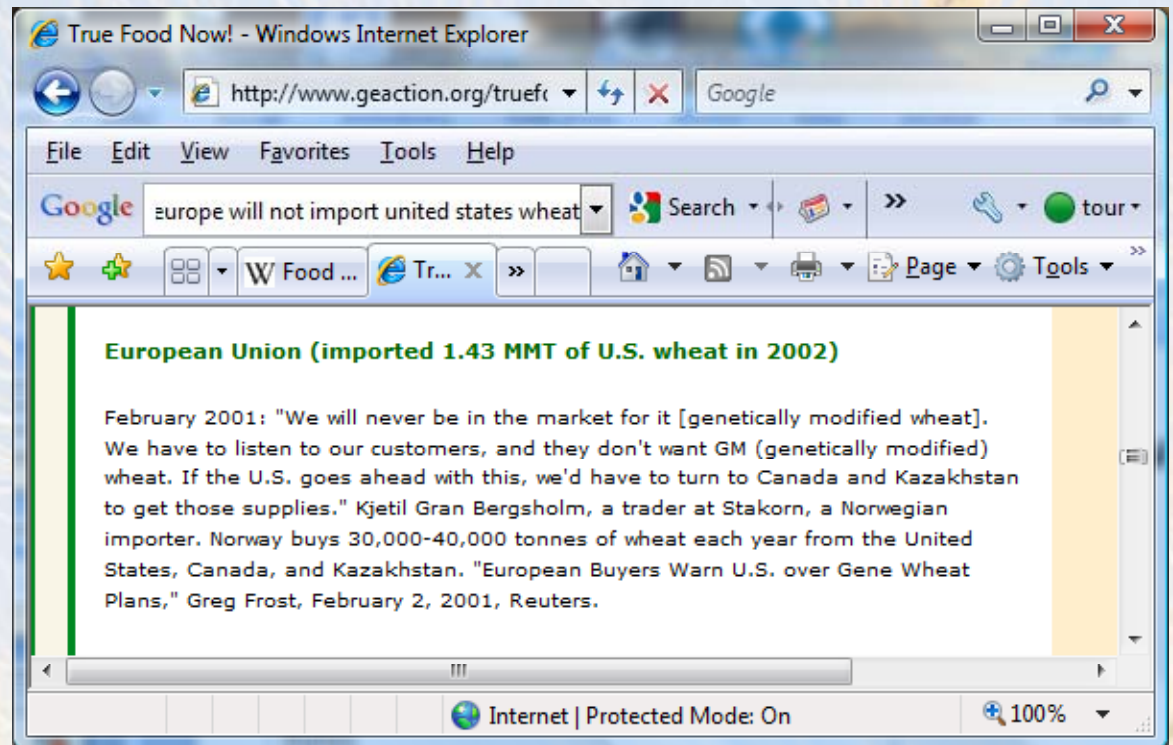
Why Is It More Common Now?

Genetic modification of wheat has increased its gluten content by 50% compared to 50 years ago and has resulted in other countries banning the import of GMO U.S. wheat

90% of commercially sold food products in the U.S. contain genetically modified corn, wheat or soybean.

Organic products do not contain genetically-modified organisms (GMO)

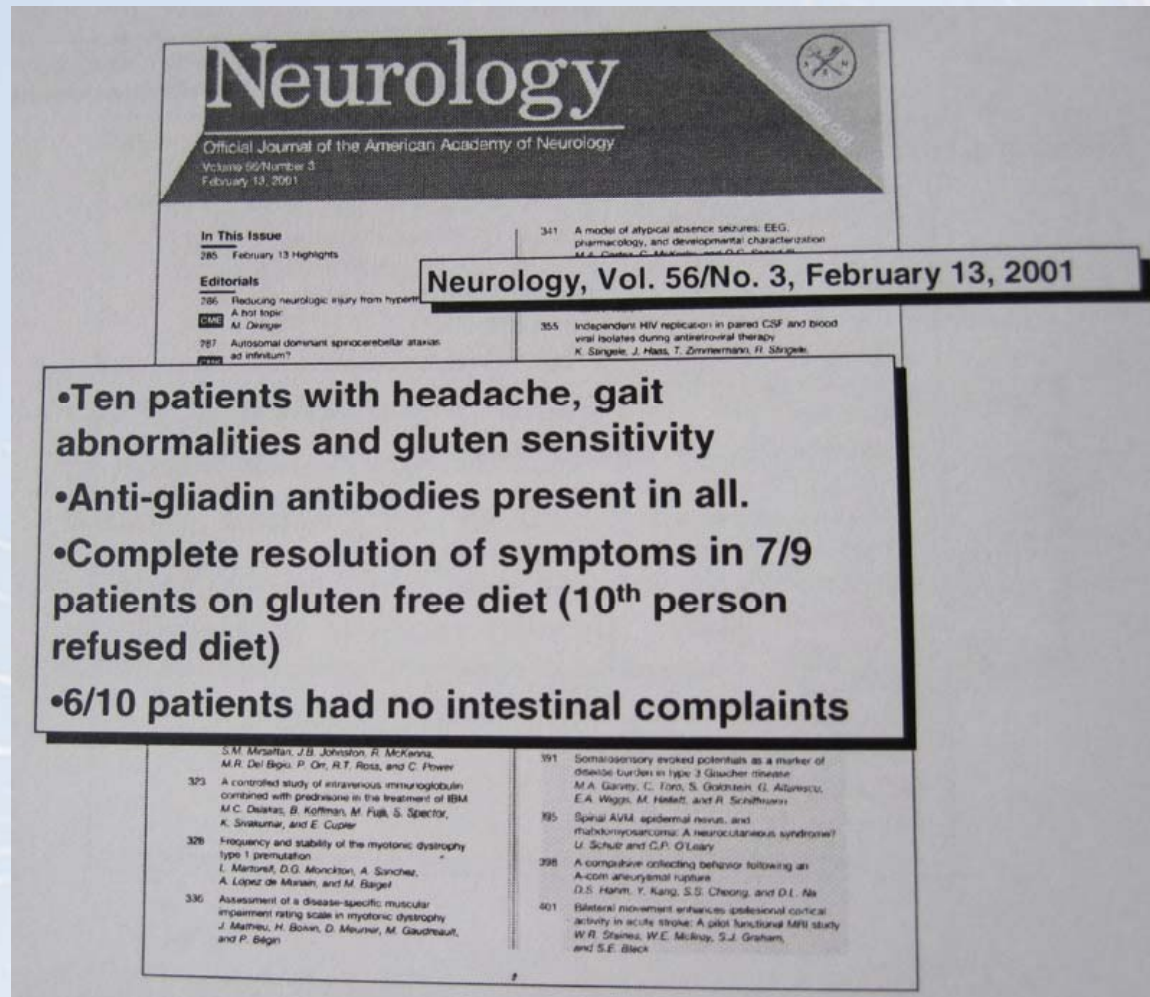
Monsanto has developed a strain of wheat that is resistant to Round Up so that farmers can spray Round Up on their wheat crops



Why is Gluten Free Such a Buzz?

- Research is linking gluten intolerance with many common symptoms and disorders
- Celebrities are increasing awareness (Jenni McCarthy, Jim Carey, Oprah, Drew Brees)
- Many people feel better eating gluten free
- Significant increase in the variety of gluten free products available
- Most grocery stores have gluten free items available

Research – Gluten & Headaches



Source: Unlocking the Secrets of Gluten Sensitivity. Implications for Neurological, Musculoskeletal, and Immune Health. Thomas O'Bryan, D.C. March 2008

Research – Gluten & Arthritis

“A wheat gluten mechanism has been studied in rheumatoid arthritis patients. The clinical observation is that wheat ingestion is followed within hours by increased joint swelling and pain. Little and his colleagues studied the mechanism, as it developed sequentially following gluten ingestion....

Our preference is to try to stop the inflammatory activity as soon as possible with diet revision.”

Sources:

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Research – Gluten & Heart Disease

Mayo Clin Proc. • May 2005;80(5):674-676 • www.mayoclinicproceedings.com 674
CELIAC DISEASE—ASSOCIATED CARDIOMYOPATHY
Cardiomyopathy Associated With Celiac Disease
CASE REPORT
NISHEETH K. GOEL, MD; ROBERT KAMATH, MD

Mayo Clin Proc. • May 2005;80(5):674-676

From the Department of Internal Medicine (N.K.G., R.D.M., P.S.K.), Division of Cardiovascular Diseases (R.D.M.), and Division of Gastroenterology and Hepatology (P.S.K.), Mayo Clinic College of Medicine, Rochester, Minn. Individual reprints of this article are not available. Address correspondence to Patrick S. Kamath, MD, Division of Gastroenterology and Hepatology, Mayo Clinic College of Medicine, 200 First St SW, Rochester, MN 55905 (e-mail: kamath.patrick@mayo.edu).
© 2005 Mayo Foundation for Medical Education and Research.
Celiac disease or celiac sprue is predominantly a disease of the small intestine characterized by chronic malabsorption in genetically susceptible individuals who ingest grains containing gluten.

Celiac disease in adults is often asymptomatic or presents with extremely few symptoms. A high degree of clinical suspicion is required to make a prompt and correct diagnosis. Cardiomyopathy associated with celiac disease is a serious and potentially lethal condition. However, if diagnosed early, cardiomyopathy may be completely reversible with initiation of a gluten-free diet.

of malabsorption and whose cardiac function improved substantially after treatment with a gluten-free diet.

Source: Unlocking the Secrets of Gluten Sensitivity. Implications for Neurological, Musculoskeletal, and Immune Health. Thomas O'Bryan, D.C. March 2008

Research – Gluten & Osteoporosis

ORIGINAL INVESTIGATION

Increased Prevalence of Celiac Disease and Need for Routine Screening Among Patients With Osteoporosis

William F. Stenson, MD, PhD
Christine Pappas, MD, PhD

ARCH INTERN MED/Vol. 165, Feb.28,2005, 393-399

Background: There is an association between osteoporosis and celiac disease. However, the relative prevalence of celiac disease among osteoporosis and nonosteoporosis populations is not known, and the impact of screening the osteoporosis population for celiac disease remains controversial.

Methods: We evaluated 840 individuals, 266 with and 574 without osteoporosis, from the Washington University Bone Clinic by serologic screening for celiac disease. Individuals with positive serologic test results for autoimmune transglutaminase or anti-endomysial antibodies at first evaluation returned biopsy or, in cases of celiac disease, individuals with biopsy-proven celiac disease were treated with a gluten-free diet and followed for improvement in bone mineral density.

Results: The prevalence of celiac disease among osteoporosis patients had positive biopsy results, the prevalence of biopsy-proven celiac disease was 7.4% among the osteoporosis population and 0.7% among the nonosteoporosis population. All biopsy-proven individuals showed positive results for transglutaminase and/or endomysial antibodies. The autoimmune transglutaminase levels correlated with the severity of osteoporosis as measured by T score, with the severity of celiac disease, the celiac disease being more severe the resulting osteoporosis. Treatment of the patients with celiac disease with a gluten-free diet resulted in marked improvement in T score.

Conclusions: The prevalence of celiac disease among osteoporosis individuals is 14.4% or much higher than that seen in nonosteoporosis individuals (2.1%). The results

For editorial comment see page 370

METHODS

PROTOCOL

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Reprints: Dr Stenson, 660 South Euclid Avenue, St Louis, Mo 63110.

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The prevalence of CD in osteoporosis is high enough to justify a recommendation for serologic screening (blood tests) of all patients with osteoporosis for celiac disease.



Ann Rheum Dis. 2002 Jan;61(1):87-9

LETTERS

Proximal myopathy and bone pain on the preceding features of celiac disease

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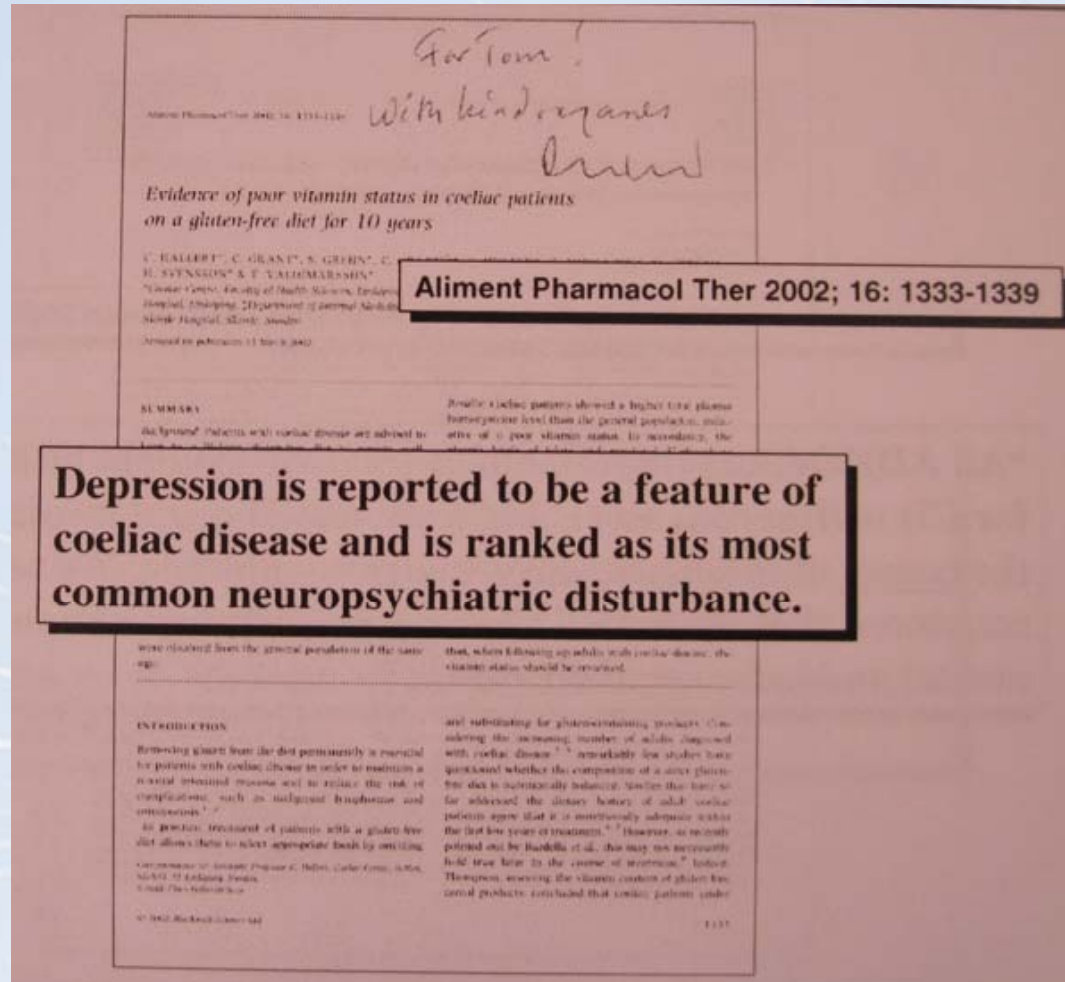
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Treatment with a gluten-free diet with subsequent villous restitution on repeat biopsy has been associated with rapid gains and even normalization of bone mineral density; the greater the degree of osteopenia, the more rapid the gain. The change is due to improvement of calcium and vitamin D status, leading to remineralisation of the large volume of unmineralised osteoid matrix.

Source: Unlocking the Secrets of Gluten Sensitivity. Implications for Neurological, Musculoskeletal, and Immune Health. Thomas O'Bryan, D.C. March 2008

Research – Gluten & Depression



Source: Unlocking the Secrets of Gluten Sensitivity. Implications for Neurological, Musculoskeletal, and Immune Health. Thomas O'Bryan, D.C. March 2008

Research – Gluten & Autism

Journal of Internal Medicine 1997; 242: 421-423

CASE REPORT

J Int Med. 1997;242:421-423

Schizophrenic symptoms and SPECT abnormalities in a coeliac patient: regression after a gluten-free diet

A. DE SANTIS, G. ADDORRATO, A. ROMITO, S. CAPELO, A. GIORDANO, G. GAMBASSI, C. TARANTO, R. MANNA & G. GASBARRINI
From the Department of Internal Medicine, Gastroenterology, Nutrition, Infectious and Parasitology, Catholic University, Rome, Italy

Abstract. De Santis A, Addorato G, Romito A, Capelo S, Giordano A, Gambassi G, Taranto C, Manna R (Catholic University, Rome, Italy). Schizophrenic symptoms and SPECT abnormalities in a coeliac patient: regression after a gluten-free diet. *J Intern Med* 1997; **242**: 421-423.

She was treated with Fluphenazine, Thioridazine and Lorazepam. She was a dropout from the outpatient clinic. After 2 years she presented with diarrhea, weight loss, malnutrition and diarrhea. Psychiatric symptoms of affective flattening, avolition (lack of desire, motivation, or persistence), autistic behaviour, auditory hallucinations, telepathic thought and catastrophic expectations were still present.

Keywords: coeliac disease, extra-intestinal manifestations, schizophrenia, SPECT.

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Schizophrenic symptoms and SPECT abnormalities in a coeliac patient: regression after a gluten-free diet

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After a follow-up of 1 year the patient is still asymptomatic.

Keywords: coeliac disease, extra-intestinal manifestations, schizophrenia, SPECT.

Case report

In January 1995 a 33-year-old woman was admitted to our hospital with severe diarrhoea and weight loss. Four years before admission she showed psychiatric symptoms of schizophrenic spectrum that became more severe in August 1992 with autistic disorder, social-occupational dysfunction, affective flattening and intellectual thinking. The diagnosis of schizophrenia was made according to the current diagnostic criteria of DSM-IV-R and the patient was treated with fluphenazine (25 mg *im*), thioridazine (50 mg *daily*) and lorazepam (5 mg *daily*). The patient had been a dropout from the psychiatric outpatient clinic until October 1992 while the psychiatric symptoms persisted. After two years she came to our observation because of diarrhoea, weight loss, malnutrition and anaemia. Psychiatric symptoms of affective flattening, avolition, autistic behaviour, auditory hallucinations, telepathic thought, and catastrophic expectations were still present.

On admission to our hospital, the diagnosis of schizophrenia was again confirmed by the current diagnostic DSM-IV criteria. The laboratory tests showed macrocytosis (92.1 fL), low iron levels (11 µg dL⁻¹) without anaemia, low serum levels of total proteins (5.7 g dL⁻¹) and albumin, hypokalaemia, low prothrombin activity, abnormal xylouric acid, and hypogammaglobulinemia with low levels of IgG (0.12 g/dL). Abil cholesterol was also present (4.01 = 50.33 L⁻¹), GPT = 33.3 U L⁻¹, alkaline phosphatase = 50 U L⁻¹. Her body weight was 38 kg and distal oedema was observed. Jejunal biopsy showed subtotal villous atrophy with lamellipodium

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Source: Unlocking the Secrets of Gluten Sensitivity. Implications for Neurological, Musculoskeletal, and Immune Health. Thomas O'Bryan, D.C. March 2008

Research – Gluten & Gall Stones

The Liver in Celiac Disease
Alberto Rubio-Tapia and Joseph A. Murray

Celiac disease is a common (1% prevalence) chronic immune-mediated disorder of the small intestine induced by dietary wheat, barley, and rye. Several hepatic disorders have been described in association with celiac disease. Isolated histologic changes in a liver biopsy is the commonest. A gluten-free diet normalizes liver enzymes and, over time, celiac disease can coexist with autoimmune liver disorders such as autoimmune hepatitis, primary biliary cirrhosis, and primary sclerosing cholangitis. Celiac disease has increasingly been reported with a variety of other liver diseases. Thus, the hepatologist needs to consider celiac disease in the differential of abnormal liver blood tests and to be aware of the clinical implications of this frequent disease in patients with liver disorders. The possible mechanisms of liver injury and those common factors that explain the association of celiac disease with liver disorders are discussed. The aims of this article are (1) to review the spectrum and pathogenesis of liver injury related to celiac disease and (2) to provide direction to those caring for patients with chronic liver diseases regarding the detection and effective treatment of celiac disease. (HEPATOLOGY 2007;46:1650-1656.)

HEPATOLOGY, Vol. 46, No. 5, 2007

CD is associated with increased fasting gallbladder volume and reduced gallbladder emptying in response to meals

other organs, such as the nervous system, bones, skin, heart, and, likely, the liver.²⁻⁴

Abbreviations: anti-tissue transglutaminase (tTG), autoimmune hepatitis (AIH), alkaline phosphatase (ALP), chronic autoimmune hepatitis (CAH), hepatitis B virus (HBV), CD, celiac disease, ESR, fasted overnight gallbladder volume, fasting insulin, fasting insulin to glucose ratio (FIR), immunohistochemical immunoprecipitation (IIP), HLA-DQ2, human leukocyte antigen (HLA), human leukocyte antigen (HLA), primary biliary cirrhosis (PBC), primary sclerosing cholangitis (PSC), serological immunology techniques (SIT), small intestine mucosal atrophy (SMA), small intestine mucosal thickness (SMT).

From the Department of Gastroenterology and Hepatology, Mayo Clinic College of Medicine, Rochester, MN.

Supported by a 2006 American College of Gastroenterology Department of Gastroenterology Training Grant for A.R.T. (contract grant no. 57002 and 24-07091) from the National Institutes of Health (to J.A.M.).

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1650

atrophy on the small intestine.^{5,6} CD itself may injure the liver but also may modify the clinical impact of chronic liver diseases when they coexist. The aims of this review are (1) to explore the spectrum and pathogenesis of liver abnormalities described in CD and (2) to summarize the association between CD and various chronic liver disorders to provide a basis for a rational diagnostic and therapeutic approach that those who care for patients with liver disease can incorporate into practice.

Material and Methods (Review Criteria)

PubMed was searched in June 2007 for full articles published in English language journals from 1963 to June 2007 with the following keywords done in combination: "celiac disease," "sprue," "liver disorders," "liver involvement," "liver tests," "hepatitis," "cholangitis," and "cirrhosis." In this literature search, several points became obvious: (1) properly designed epidemiological studies are

Source: Unlocking the Secrets of Gluten Sensitivity. Implications for Neurological, Musculoskeletal, and Immune Health. Thomas O'Bryan, D.C. March 2008

Research – Gluten & Thyroid Disease

Journal of Pediatric Gastroenterology and Nutrition
 37(4):207-210 November 2002 (Volume 35 Number 4) Williams & Wilkins, Inc. Philadelphia

Short Communication

J of Ped Gastro Nutr 35:704-705

Thyroid Autoimmunity in Childhood Celiac Disease

Giuseppina Odeh, Anna Rapa, Annalisa Zavalone, Laura Stigini, and Gianni Bozzi
 Clinica Pediatrica, Università del Piemonte Orientale, Novara, Italy

Key Words: Celiac Disease—Thyroiditis—Hypothyroidism—Celiac—Autoimmune Diseases © 2002 Lippincott Williams & Wilkins, Inc.

Our data are in agreement with other studies reporting a correlation between a late diagnosis of CD, which mirrors longer gluten exposure, and the prevalence of autoimmune thyroid antibodies

We studied 60 children with CD (35 females, 25 males) diagnosed with jejunal biopsy according to the European Society of Pediatric Gastroenterology and Nutrition criteria. Forty-one children were associated and on a gluten-containing diet. Serum samples were obtained the same day of the first jejunal biopsy. Nineteen children were on a gluten-free diet and 6 children were on a short reaction (3 months) gluten challenge to confirm the diagnosis. Scores (titers of TPO and TG) were measured, and when raised we measured FT4, FT3, and TSH, and performed thyroid ultrasonography using a 3.5-MHz linear probe. Thyroid patterns were classified according to Sacha criteria (3). Follow-up was after a gluten-free diet of 3 months in 15 cases, were assessed for TPO and TG in 30 children.

Correlation in Giuseppina Odeh, Clinica Pediatrica, Università del Piemonte Orientale, Via Solaro 17, 28100 Novara, Italy (e-mail: odeh@uni-novara.it).

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ACTA BIO MEDICA 2003; 74: 9-33

REVIEW

Update on autoimmune polyendocrine syndromes (APS)

Cecelia Bertrik, Renato Zanobetti
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Thyroid Autoimmune Diseases are the most frequent autoimmune diseases in the population being present on average in 7-8% of the general population, (approximately 24 million people) in the U.S

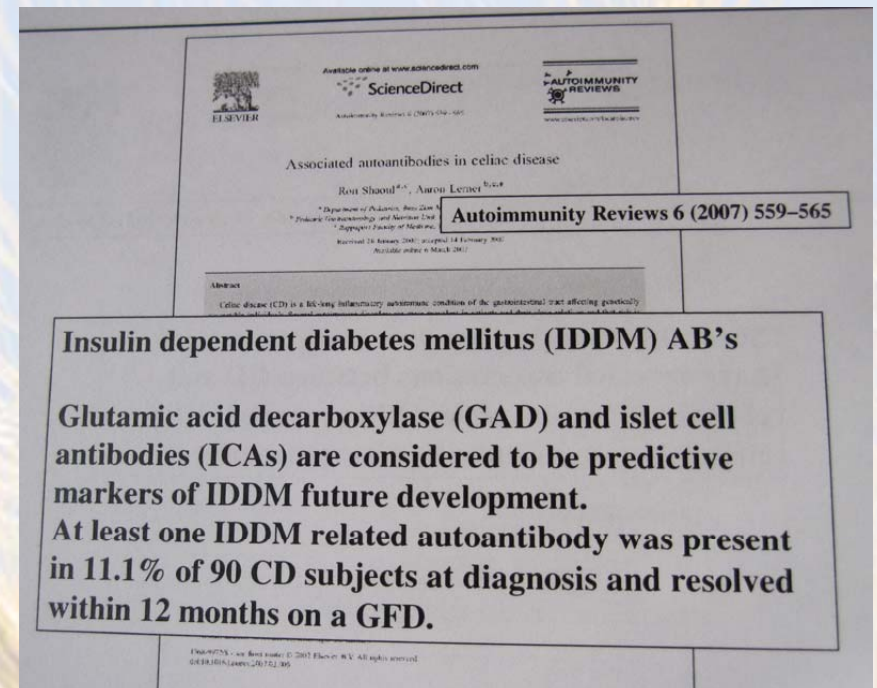
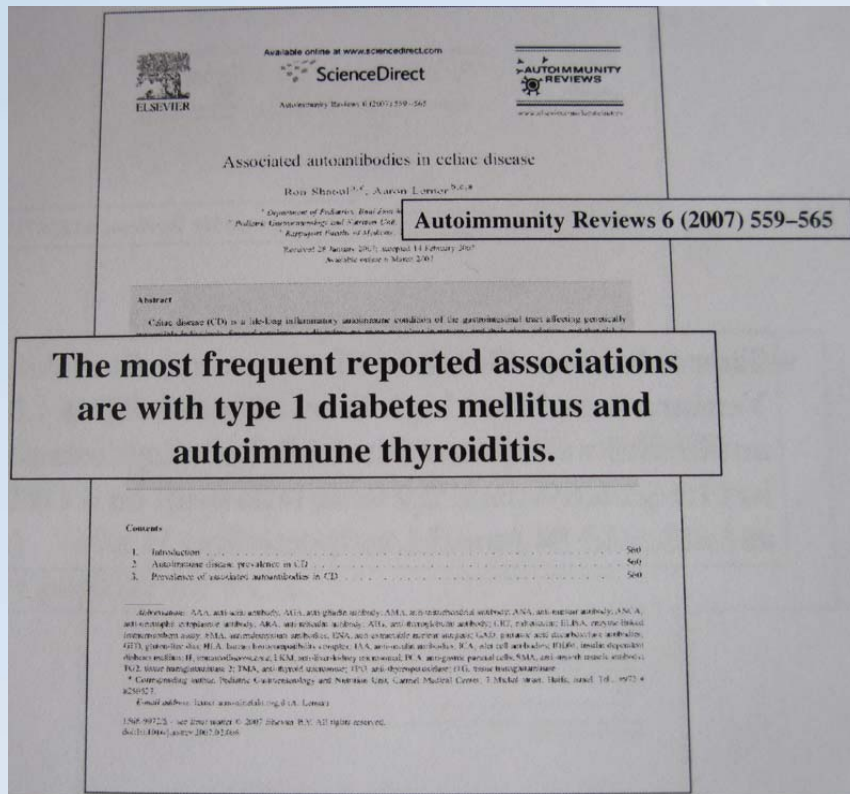
Abstract. Autoimmune Polyendocrine Syndromes (APS) were initially defined as a multiple endocrine gland autoimmunity associated to an autoimmune disease in a patient. Nisfeld & Hazzard (1980) suggested a classification of APS based on clinical criteria only, describing four main types: APS-1 is characterized by presence of chronic candidiasis, chronic hypoparathyroidism, Addison disease. It is a very rare syndrome occurring in young subjects correlating to different mutations of AIRE (AutoImmune-Regulator) gene on chromosome 21. APS-2 is characterized by presence of Addison disease (always present), autoimmune thyroid disease and/or type 1 diabetes mellitus. It is a rare syndrome occurring particularly in adult females and associated to a specific pattern of HLA-DR3/DR4. Autoimmune thyroid diseases associated to other autoimmune diseases (in particular APS) were initially defined as a multiple endocrine gland autoimmunity associated to an autoimmune disease in a subject. Probably the first description of an APS dates back to 1855 when Thomas Addison described parathyroid adenoma and vitiligo, in a patient with idiopathic adrenal insufficiency (4). Subsequently, the association between diabetes in APS was noted and no longer considered but in particular combination and that some non-endocrine autoimmune diseases were also part of the syndromes. After a careful clinical observation of affected patients, Nisfeld and Hazzard in 1980 suggested a classification of APS based on clinical criteria only, and described four main types (Table 1).

Pathogenesis of APS

In 1988 Claude (5) first hypothesized a common pathogenesis of APS, however it was not the time yet

Source: Unlocking the Secrets of Gluten Sensitivity. Implications for Neurological, Musculoskeletal, and Immune Health. Thomas O'Bryan, D.C. March 2008

Research – Gluten & Diabetes



Source: Unlocking the Secrets of Gluten Sensitivity. Implications for Neurological, Musculoskeletal, and Immune Health. Thomas O'Bryan, D.C. March 2008

Research – Gluten & Eczema/ Psoriasis



Source: Unlocking the Secrets of Gluten Sensitivity. Implications for Neurological, Musculoskeletal, and Immune Health. Thomas O'Bryan, D.C. March 2008

Research – Gluten & ADD/ADHD

A Preliminary Investigation of ADHD Symptoms in Persons With Celiac Disease
 Helmut Niederhoffer
 Klaus Fritschley
 Regional Hospital of Bolzano, Italy

Journal of Attention Disorders, March 2006, 1-5

In 132 participants all clinically dx'd with ADHD, after at least 6 months of a gluten-free diet, all patients or their parents reported a significant improvement in their behavior and functioning compared to the immediate period before diagnosis and dietetic treatment

Objective: Several studies have indicated that the possibility of an ADHD-like symptomatology is significantly increased among untreated CD patients and that a gluten-free diet may improve symptoms significantly within a short period of time. The results of this study also suggest that CD should be included in the list of diseases associated with ADHD-like symptomatology.

Conclusion: The data indicate that ADHD-like symptomatology is markedly overrepresented among untreated CD patients and that a gluten-free diet may improve symptoms significantly within a short period of time. The results of this study also suggest that CD should be included in the list of diseases associated with ADHD-like symptomatology.

Author's Note: Address correspondence to Helmut C. Niederhoffer, Behavioral Research Unit, Alberta Children's Hospital, 2808 Shaganappi Trail SW, Calgary, Alberta, Canada T2H 6A8, phone: (403) 943-7863, email: niederh@albertahealthservices.ca. The authors thank Alberta Mental Health Research Fund and the Alberta Children's Hospital Foundation for financial support and Brenda Wilson, M.S., O.T.C., for helping organize and conduct the motor skills assessments.

A Preliminary Investigation of ADHD Symptoms in Persons With Celiac Disease
 Helmut Niederhoffer
 Klaus Fritschley
 Regional Hospital of Bolzano, Italy

Journal of Attention Disorders, March 2006, 1-5

“All ADHD-like symptomatology patients should be tested for CD with serum screening tests, as CD could be one of the causes of these neuropsychiatric symptoms. We are convinced that untreated CD may predispose to important mental and behavioral disorders.”

Objective: Several studies have indicated that the possibility of an ADHD-like symptomatology is significantly increased among untreated CD patients and that a gluten-free diet may improve symptoms significantly within a short period of time. The results of this study also suggest that CD should be included in the list of diseases associated with ADHD-like symptomatology.

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Research – Gluten & Fibromyalgia

Clin Rheumatol (2005) 24: 76-78
DOI 10.1007/s00395-004-0771-5

CASE REPORT

Ekan Kozanoglu · Nihal Bayraktar · M. Kamal Gencu

Proximal myopathy as an unusual presenting feature of celiac disease

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© Clinical Rheumatology 2004

Abstract A 57-year-old woman presented with back pain, diffuse musculoskeletal pain, and muscle weakness without marked gastrointestinal symptoms. She complained of difficulty in walking and bilateral hip pain for the preceding year. Clinical examination revealed proximal muscle weakness especially in the lower extremities of osteoarthritis [4]. However, it is rare for celiac disease to present only with osteoarthritis symptoms such as proximal muscle weakness, diffuse musculoskeletal pain, and fractures in the absence of a specific pattern [4, 5, 6, 7, 8, 9, 10, 11]. Herein we present a patient with osteoarthritis symptoms who had previously undiagnosed

Celiac Disease should be considered in the differential diagnosis of patients presenting with proximal muscle weakness and diffuse musculoskeletal pain.

characterized by a strong genetic association (HLA-DQ2 or DQ8) [1]. It is an inflammatory disorder of the small intestine and clinical manifestations range from asymptomatic to severe malabsorption [2, 3]. In adult celiac disease presentations are ataxia and variable abdominal symptoms. Less commonly, patients present with a more typical history with features of steatorrhea, weight loss, bloating, and other symptoms of nutritional deficiencies resulting from malabsorption [1]. Patients with overt celiac disease will occasionally have evidence

revealed proximal muscle weakness, especially in the lower extremities, and hyporeflexia in four extremities. Hip flexor and abductor strength was 3.5 bilaterally. Hip range of motion was limited and painful. She had a swelling pain pattern. She also experienced pain on her spine by percussion.

Laboratory investigations showed iron deficiency anemia (hemoglobin, 7.90 g/dl (12–16 g/dl). Fasting serum alkaline phosphatase (ALP) of 149 U/L (30–365 U/L), decreased calcium of 7.7 mg/dl (8–10.6 mg/dl), and inorganic phosphorus of 1.6 mg/dl (2.5–4.2 mg/dl) were found. The 25-hydroxy vitamin D level was 11.5 ng/ml (14–25 ng/ml) and parathyroid hormone level was 366 pg/ml (18–65 pg/ml). Other laboratory investigations including erythrocyte sedimentation rate (ESR), C reactive protein (CRP), thyroid function tests, and serumine kinase were normal. Antinuclear antibodies (ANA) and anti-DNA were negative. Parathy-

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Muscle Nerve 35: 443–450, 2007

ABSTRACT: Ataxia and peripheral neuropathy are the most common neurological manifestations of gluten sensitivity. Myopathy is a less common and poorly characterized additional neurological manifestation of gluten sensitivity. We present our experience with 13 patients who presented with symptoms and signs suggestive of a myopathy and in whom investigation led to the diagnosis of myopathy.

Myopathy Associated with Gluten Sensitivity

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Myopathy may be another manifestation of gluten sensitivity and is likely to have an immune-mediated pathogenesis.

“disease” should now be restricted to gluten-sensitive enteropathy characterized by the triad of villous atrophy, crypt hyperplasia, and increase in intraepithelial lymphocytes on histological study of the small bowel. Other manifestations of gluten sensitivity include dermatitis herpetiformis and neurological disorders (eg, gluten ataxia, neuropathy).

oped neurological illness showed that the most common neurological manifestations were ataxia (29 patients) and peripheral neuropathy (29 patients).¹⁶ The third most common entity was myopathy (13 patients). Myopathy in the context of gluten sensitivity has not been well characterized. Muscle involvement in the context of gluten sensitivity might be produced given that antibodies against endomysium are the most sensitive markers for the presence of enteropathy seen in a subgroup of patients with gluten sensitivity (ie, patients with celiac disease). The antigen that endomysium antibodies recognize is gluten-α-gliadin.¹⁷

We now report the clinical, neurophysiological, and neuropathological characteristics of a series of 13 patients with gluten sensitivity who presented with

Abbreviations: CD, celiac disease; ESR, erythrocyte sedimentation rate; Hb, hemoglobin; HbA1c, hemoglobin A1c; IgG, immunoglobulin G; IgM, immunoglobulin M; IgA, immunoglobulin A; IgE, immunoglobulin E; IgG, immunoglobulin G; IgM, immunoglobulin M; IgA, immunoglobulin A; IgE, immunoglobulin E.

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Myopathy and Gluten Sensitivity MUSCLE & NERVE April 2007 443

Source: Unlocking the Secrets of Gluten Sensitivity. Implications for Neurological, Musculoskeletal, and Immune Health. Thomas O'Bryan, D.C. March 2008

Research – Gluten & Irritable Bowel Syndrome

“Recent clinical evidence supports the view of gluten sensitivity as the likely cause of gastrointestinal symptoms that would otherwise point to of IBS (Irritable Bowel Syndrome).

This information dovetails with other recent information regarding the prevalence of gluten sensitivity. The idea that gluten sensitivity is far more widespread than believed , and that gluten sensitivity lies at the heart of numerous gastrointestinal and other systemic disorders is rapidly gaining support from data, and drawing new believers within the scientific community.”

Source: Am J Gastroenterol; 19 May 2009

Research – Gluten & Crohn's Disease

“Researchers in Italy have determined that those with Crohns disease also have a high prevalence of celiac disease...

The researchers conclude that there is a high prevalence of celiac disease in those with Crohns disease, and that all patients who are diagnosed with Crohns disease should begin a gluten-free diet at the time of diagnosis.”

Source: Inflamm bowel Dis. 2005 Jul;11(7):662-666.

Research – Gluten & Liver Disease

The Liver in Celiac Disease
 Alberto Rubio-Tapia and Joseph A. Murray

HEPATOLOGY, Vol. 46, No. 5, 2007

Celiac disease is a common (1% prevalence) chronic immune-mediated disorder of the small intestine induced by dietary wheat, barley, and rye. It is associated with celiac disease. histologic changes in a liver biopsy is the common. A gluten-free diet normalizes liver enzymes and over, celiac disease can coexist with autoimmune liver disorders such as autoimmune hepatitis, primary biliary cirrhosis, and primary sclerosing cholangitis. Celiac disease has increasingly been reported with a variety of other liver diseases. Thus, the hepatologist needs to consider celiac disease in the differential of abnormal liver blood tests and to be aware of the clinical implications of this frequent disease in patients with liver disorders. The possible mechanisms of liver injury and those common factors that explain the association of celiac disease with liver disorders are discussed. The aims of this article are (1) to review the spectrum and pathogenesis of liver injury related to celiac disease and (2) to provide direction to those caring for patients with chronic liver diseases regarding the detection and effective treatment of celiac disease. (HEPATOLOGY 2007;46:1650-1658.)

A large general population-based study from Sweden reported that individuals with CD have a 2-fold to 6-fold increased risk of later liver disease and that prior liver disease increases the risk of later CD (4-fold to 6-fold increase)

Material and Methods (Review Criteria)

PubMed was searched in June 2007 for full articles published in English language journals from 1963 to June 2007 with the following keywords alone or in combination: "celiac disease," "sprue," "tropical sprue," "liver involvement," "liver tests," "hepatitis," "cholangitis," and "cirrhosis." In this literature search, several points became relevant: (1) properly designed epidemiological studies are

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A GFD leads to normalization of serum transaminases in 75% to 95% of patients with CD, usually within a year of good adherence to the diet. All the patients with nonspecific changes in the liver histology and a follow-up liver biopsy normalized the histological changes after adherence to a GFD.

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Source: Unlocking the Secrets of Gluten Sensitivity. Implications for Neurological, Musculoskeletal, and Immune Health. Thomas O'Bryan, D.C. March 2008

Research – Gluten & Dental Defects

DOI: 10.1111/j.1545-5052.2006.00163.x

Dental enamel defects in children with coeliac disease

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163-168

Int Journal of Pediatric Dent. 2007; 17:163-168

Objective. The aim of this study was to investigate whether Dutch children with proven coeliac disease show specific dental enamel defects, and to assess whether children with the same gastrointestinal complaints, but proven non-coeliac disease, lack these specific dental enamel defects.

Materials and methods. Eighty-one children (53 coeliac subjects and 28 control subjects) were examined during the period 2003-2004 in the Oral Surgery Outpatient Clinic of the Academic Medical Centre in Amsterdam.

Introduction

and the USA in children between 2.5 and 15 years of age is approximately 1:500 to 1:80¹

Conclusion. This study showed significantly more specific enamel defects in Dutch children with coeliac disease as compared with children in the control group. Dentists could play an important role in recognizing patients with coeliac disease.

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Source: Unlocking the Secrets of Gluten Sensitivity. Implications for Neurological, Musculoskeletal, and Immune Health. Thomas O'Bryan, D.C. March 2008

Testing for Gluten Intolerance

Intestinal biopsy – a sample of tissue collected from an organ

Gastrointestinal endoscopy – a thin, lighted tube that looks inside your intestines

Blood – only 30% specific (misses 70%). Shows gluten antibodies

Saliva – 60% sensitivity (misses 40%). Can assess genes affiliated with celiac disease

Stool – checks for antibodies to gluten in the stool.

BIM (Bioelectrical Impedance Measurement) – uses electrical conductivity measurements along acupuncture points to determine organ system balances and food sensitivities

Avoidance diet – avoiding a food and observing if improvement results

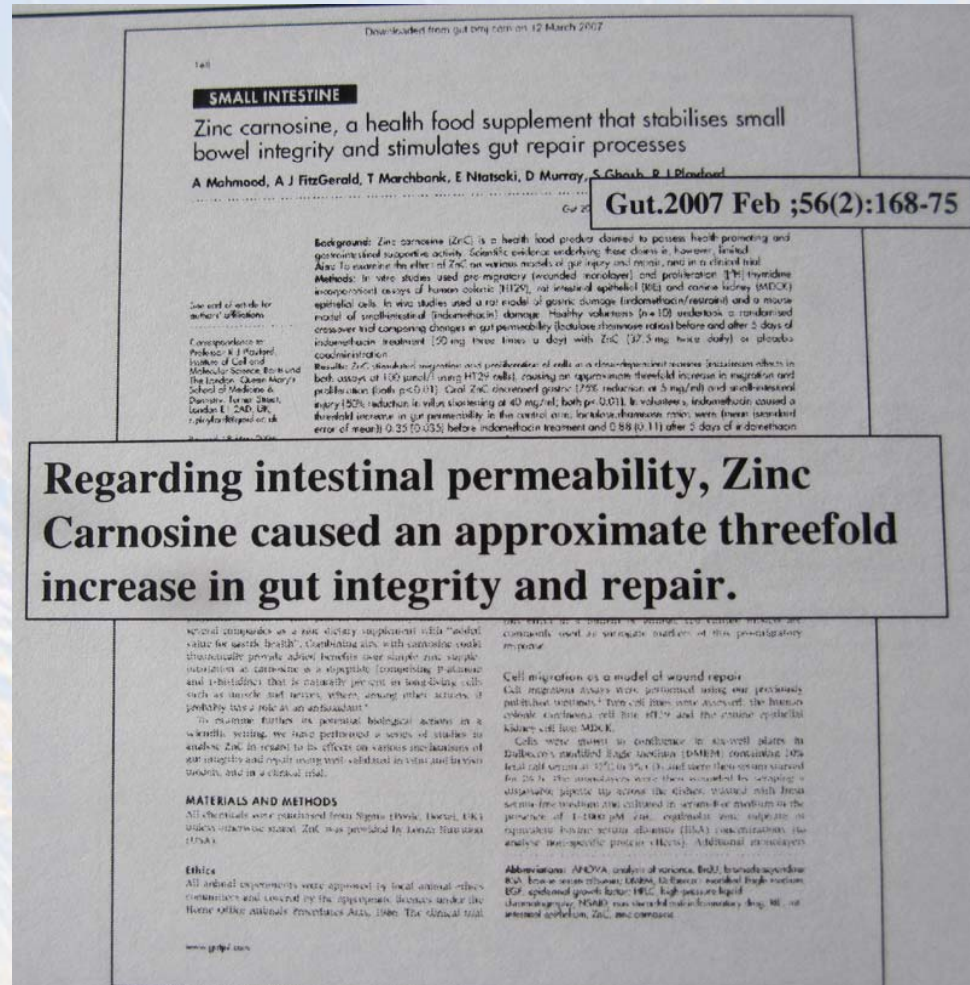
Nutritional Supplements

The following nutritional supplements have been found to be beneficial for those with gluten intolerance.

- Zinc
- Probiotics
- Essential Fatty Acids
- Vitamin D

Nutritional Supplements - Zinc

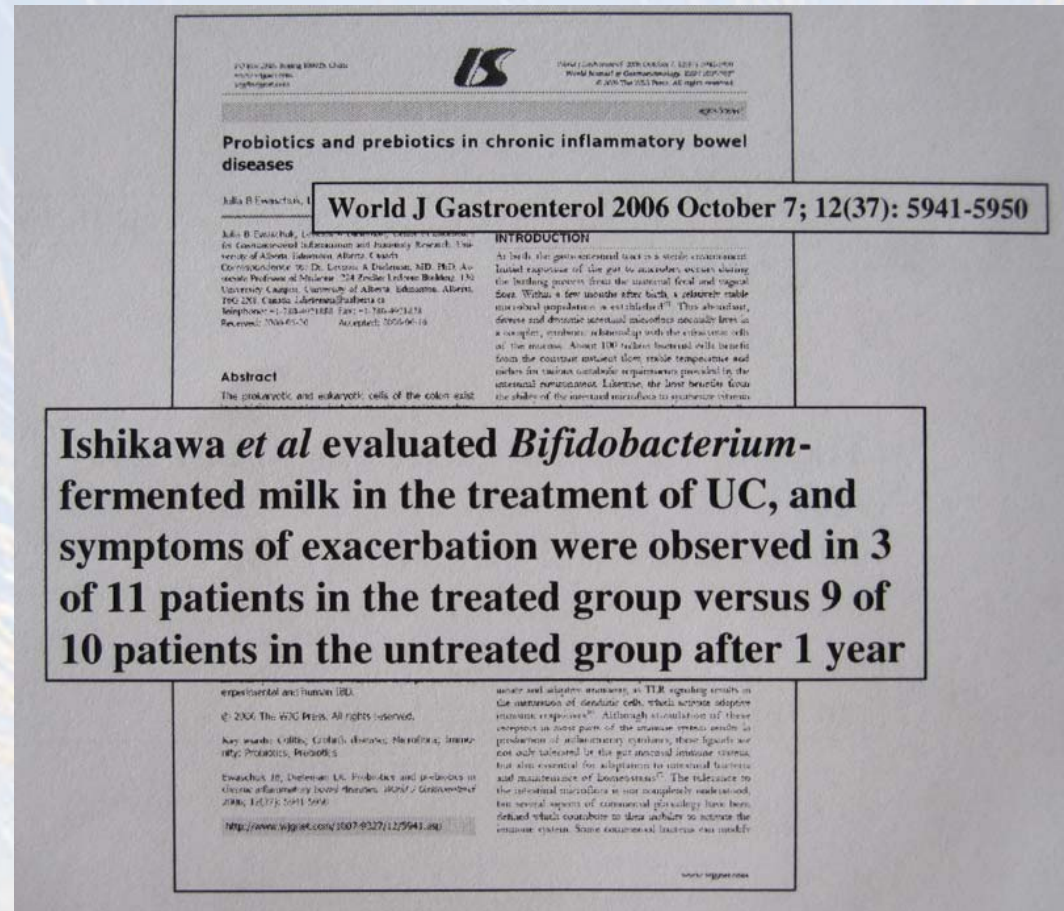
- A taste test for zinc is available
- Zinc plays a critical role in the immune system as well



Source: Unlocking the Secrets of Gluten Sensitivity. Implications for Neurological, Musculoskeletal, and Immune Health. Thomas O'Bryan, D.C. March 2008

Nutritional Supplements - Probiotics

- Probiotics are depleted in the body by antibiotics and foods that cause inflammatory reactions in the gut



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Nutritional Supplements – Essential Fatty Acids

**Reducing Pain and Inflammation Naturally.
Part II: New Insights into Fatty Acid Supplementation and
Its Effect on Eicosanoid Production and Genetic Expression**

Alex Vasquez, D.C., N.D.

Nutritional Perspectives, Vol. 28, no. 1, 1-16

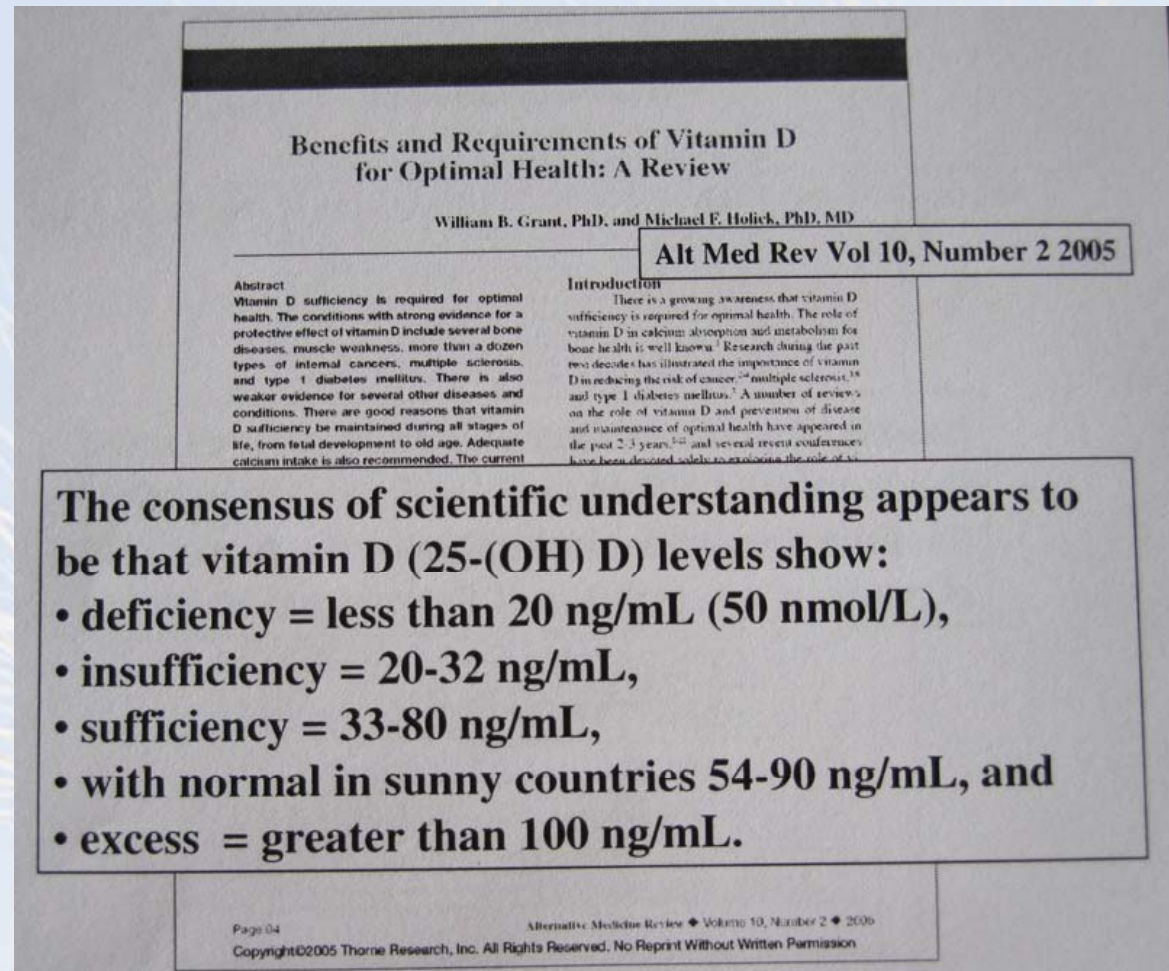
EPA-derived eicosanoids have anti-inflammatory properties, including a reduction in the production of proinflammatory eicosanoids such as LT-B4, PAFs, and cytokines such as TNF-alpha and IL-1, and a large reduction in PG-E2 and TX-B

*Nutritional Perspectives: Journal of the Council on Nutrition of the American Chiropractic Association
January 2005*

Source: Unlocking the Secrets of Gluten Sensitivity. Implications for Neurological, Musculoskeletal, and Immune Health. Thomas O'Bryan, D.C. March 2008

Nutritional Supplements – Vitamin D

- Choose a supplement with both vitamin D and Vitamin K for maximum cardiovascular benefits
- The best source of vitamin D is exposure to sunlight but sunscreen significantly reduces the production by the body



Source: Unlocking the Secrets of Gluten Sensitivity. Implications for Neurological, Musculoskeletal, and Immune Health. Thomas O'Bryan, D.C. March 2008

How to Live Gluten Free

- 1 – Change the way you view food. Choose foods that nourish and heal your body. There are gluten free substitutes for most types of foods
- 2 – Only eat foods that you know the ingredients
- 3 – Learn how to read nutritional labels
- 4 – Have the whole family choose gluten free for support
- 5 – Plan your meals
- 6 – Eat 3 meals per day with snacks (or meal replacement shakes) between meals with an emphasis on fruits and vegetables. Strive for 40% carb / 30% fat / 30% protein per meal



What's Next?

- 1 – Get tested for gluten sensitivity or try an avoidance diet
- 2 – Learn more about gluten intolerance
- 3 – Try it! Many people notice positive changes within a month of adopting a gluten free diet
- 4 – Consult with a health care professional with knowledge about food sensitivities. Be sure that your care plan includes follow up support (eg. phone or email correspondence) as lots of questions come up along your transition
- 5 – Share this info with others you know who have health challenges. This knowledge may literally save their life

Local Places to Shop

Jerry's Foods (deli carries Boars Head brand...most of which are gluten free). Carry gluten free items in different areas of store (including baking aisle).

Lakewinds Food Coop (Chaska) - www.lakewinds.com - offer gluten free cooking classes (schedule on their website)

Tailor Made 4 U (Woodbury) - www.tailormadenutrition.com

Whole Foods (Minneapolis) - www.wholefoodsmarket.com - offer gluten free cooking classes (schedule on their website)

Local Restaurants with Gluten Free Items

Biaggi's Restornte Italiano – Eden Prairie and Maple Grove – www.biaggis.com

Buca Di Beppo – 5 MN locations - discuss gluten free options with chef

Chiang Mai Thai – Minneapolis – www.chiangmaithai.com – 612.827.1606

Chianti Grill – Burnsville and Roseville – www.chiantigrill.com – 651.644.2808

Chili's Grill and Bar – www.chilis.com – request gluten free menu

Chipolte – www.chipolte.com – view ingredients. FAQ section on website for gluten intolerance

Christo's Greek Restaurant – Minneapolis – ask server for gluten free options. 612.871.2111

Culvers – www.culvers.com – View ingredients and food allergy info on website

Good Earth – Edina – www.goodearthmn.com – gluten free menu – 952-925-1001

King & I Thai – Minneapolis – 612.332.6925

Leann Chin Chinese Cuisine – Many local locations. Gluten free menu items available

Local Restaurants with Gluten Free Items (p. 2)

Leann Chin Chinese Cuisine – Many local locations. Gluten free menu items available

Outback Steakhouse – www.outbacksteakhouse.com – gluten free menu on website

Pei Wei Asian Diner – www.peiwei.com – gluten free menu available

P.F. Chang's China Bistro – www.pfchangs.com – gluten free menu on website

Rice Paper Vietnamese – Minneapolis – gluten free items on menu – 612.926.8650

Sidney's – St. Paul, Edina & Minnetonka – www.sidneysrestaurant.com – gluten free items on menu

Santorini's - American & Greek - Eden Prairie – www.santorinimn.com - gluten free items on menu

Wildfire – Eden Prairie – www.wildfirerestaurant.com - gluten free menu available

Testing Options

Blood testing: Can get blood work done at most medical offices. Prometheus Labs (San Diego, CA) has a complete panel experience with celiac blood panels

Small bowel biopsy: The most invasive diagnostic test is the small bowel biopsy. Many doctors can perform this test, but the best facility to interpret the results is University of Maryland's Center for Celiac Research in Baltimore

Saliva: MyCeliacID.com can identify genetic predisposition. Approx. \$350.

Bioelectrical Impedance Measurement Testing: Healthy for Life Chiropractic (Bloomington). Dr. Kevin Unterreiner, B.S., D.C. 952-829-0100. \$50 for food sensitivity profile (100 different foods tested). Evaluations include follow up support and a Chiropractic treatment.

Informative Websites

- Celiac Disease Center at Columbia University (www.celiacdiseasecenter.columbia.edu)
- Mayo Clinic: www.mayoclinic.com
- National Foundation for Celiac Awareness www.celiacawareness.org
- Celiac Disease Foundation - www.celiac.org
- Celiac Sprue Association - www.csaceliacs.org
- Gluten Intolerance Group - www.gluten.net
- University of Chicago Celiac Disease Program - www.celiacdisease.net
- Warren Medical Research Center for Celiac Research www.celiaccenter.ucsd.edu
- NIH CD Awareness campaign: www.celiac.nih.gov
- Celiac Center at Beth Israel Deaconess Medical Center www.bidmc.harvard.edu/YourHealth/ConditionsAZ/CeliacdiseaseCeliacsprue