

type 1 diabetes & coeliac disease

THE COELIAC SOCIETY



coeliac disease
& type 1 diabetes



TheCoeliacSociety

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Diabetes is a condition where there is too much glucose (sugar) in the blood (hyperglycaemia). The pancreatic hormone insulin is responsible for the transport of glucose from the blood to the body's cells where it is used as a vital source of energy. In those with diabetes, either insufficient insulin is produced by the pancreas, or the insulin produced does not work properly¹.

The classic symptoms of diabetes include: a lack of energy, excessive urine production, thirst, and unexplained weight loss¹.



Types of Diabetes

There are two main forms of diabetes: type 1 and type 2 diabetes.

Type 1 diabetes is an autoimmune disease where the β -cells in the pancreas responsible for producing insulin are destroyed. Type 1 diabetes usually develops before the age of 30, with 50% of individuals diagnosed before the age of 16². Treatment of type 1 diabetes involves insulin replacement via injection or insulin pump therapy, regular carbohydrate containing meals and snacks, and frequent monitoring of blood glucose levels. Those with type 1 diabetes have an increased risk of also having coeliac disease.

In those with type 1 diabetes, the excess glucose in the blood is passed into the urine (glycosuria). This increases the amount of urine produced (polyuria). Excessive urination leads to increased thirst to replace the lost fluid. In addition, as the body is unable to access the glucose to use as energy, it turns to its fat and protein stores (muscle) as alternative energy sources. This use of fat stores as a metabolic fuel may result in "ketoacidosis". If untreated this will lead to coma and eventual death¹.

Type 2 diabetes is more common than type 1 diabetes (although incidence of both is increasing¹¹). It is an "insulin-resistant" form of diabetes where insulin is still produced but in an ineffective form and/or in smaller amounts. There is a genetic basis to this disease and its development is closely linked with obesity. It most commonly develops in people over the age of 55, but with rising levels of obesity in the population, it is becoming increasingly common in younger adults and even children. Diet and lifestyle changes may be sufficient to control the disease, but most patients will also require oral medication. Eventually, some people may need to have insulin injections¹. There is no link between coeliac disease and type 2 diabetes, however it is possible for both of these conditions to occur in the same person but independent of each other.

Note: There is a third type of diabetes that is important to discuss in relation to coeliac disease. Latent autoimmune diabetes in the adult (LADA) is also an autoimmune diabetes that usually appears in adult life instead of childhood (as in type 1 diabetes). LADA is also known as "type 1.5 diabetes"¹². LADA is associated with coeliac disease in the same way and to the same degree as type 1 diabetes through HLA DQ2 and DQ8. Autoimmune diabetes (type 1 diabetes and LADA) is distinguished from type 2 by the presence of islet autoantibodies and HLA DQ2/8.

What is Coeliac Disease?

Coeliac disease (pronounced seel-ee-ak) is a genetic autoimmune disease. Autoimmune means the body mistakenly produces antibodies that damage its own tissues. It is a permanent intestinal intolerance to dietary gluten. A number of serious health consequences can result if the condition is not diagnosed and treated properly.

In those with untreated coeliac disease the mucosa (lining) of the small bowel (intestine) is damaged: The tiny, finger-like projections which line the bowel (villi) become inflamed and flattened (villous atrophy). Healthy villi are responsible for the digestion and absorption of nutrients from food. Villous atrophy diminishes the large surface area created by the villi. This can lead to gastrointestinal and malabsorptive symptoms. Long term consequences of untreated coeliac disease can include osteoporosis, infertility and miscarriage, depression and cancer.

Coeliac blood tests are used for initial screening ("coeliac serology and IgA"). If the results are positive or your doctor feels further testing is warranted, a referral to a gastroenterologist will be necessary. The diagnosis must be confirmed by performing a gastroscopy (an endoscope is passed through the mouth into the small bowel), to collect tiny samples (biopsies) from the small bowel. These biopsies are studied under a microscope to determine if coeliac disease is present. A gastroscopy is done in a hospital or day-procedure centre while the patient is sedated (most people find it very straight forward). Taking small bowel biopsies is an essential part of diagnosing coeliac disease as the blood test alone is not definitive. For the blood test and biopsy to be meaningful, gluten must be included in the diet for at least six weeks prior to testing (the equivalent amount of gluten from four slices of standard bread daily for adults).

The Gluten Free Diet

The only treatment for coeliac disease is a strict, lifelong gluten free diet.

Gluten is the rubbery and elastic protein found in wheat, rye, barley and oats. Gluten is responsible for the cooking and baking properties of these grains.

There are obvious foods which contain gluten e.g. bread, cakes and pasta, but there are also a whole range of ingredients within prepared and commercial foods which can

come from a gluten source. To become “ingredient aware” is essential.

Initially the gluten free diet may seem overwhelming, however with the information and support available with membership of The Coeliac Society, it will become much easier.

It is recommended you seek the guidance of an Accredited Practising Dietitian with experience in coeliac disease to help you manage your gluten free diet and ensure your diet is nutritionally balanced.

How is Type 1 Diabetes related to Coeliac Disease?

If a person has one autoimmune disease, they are at an increased risk of developing another. As many as 10% of children and adolescents with type 1 diabetes also develop coeliac disease³⁻⁹. The diabetes diagnosis is usually the first to occur, with coeliac disease diagnosed on subsequent routine screening (although it is commonly suspected that coeliac disease may have been present prior to the diagnosis of diabetes in many). Coeliac disease often causes no obvious digestive symptoms in those with diabetes, despite severe inflammation in the small intestine^{7, 9 & 14}. Undiagnosed coeliac disease has also been associated with increased frequency of (life-threatening) hypoglycaemic episodes¹³.

Those with type 1 diabetes need to carefully monitor their intake of food and drinks containing carbohydrate. When diagnosed with coeliac disease, gluten containing carbohydrates (wheat, rye, barley and oats) must be removed from the diet. This can impact on the control of blood glucose levels due to the inclusion of different carbohydrate containing foods. If you are diagnosed with both conditions, advice should be sought from a dietitian about your combined dietary requirements.

Diagnosing Type 1 Diabetes

To test for type 1 diabetes, your doctor will assess your blood glucose levels and test your urine for glucose and ketones. High levels of glucose and ketones (in the blood and urine) are highly suggestive of type 1 diabetes. It is important not to delay the diagnosis of type 1 diabetes, as it can be life threatening if left untreated. If you suspect you have type 1 diabetes, speak to your doctor.

Treatment of Type 1 Diabetes

Type 1 diabetes is a lifelong condition for which there is currently no cure. The management of type 1 diabetes involves insulin replacement via frequent daily injections or insulin pump therapy, regular blood glucose monitoring along with the right balance of healthy food choices and physical activity. If coeliac disease also develops, a gluten free diet is required as well. It is important to consider the amount and type of carbohydrate consumed. Management is a team affair. Regular medical consultations with your family doctor and/or specialists (usually endocrinologist and gastroenterologist or paediatrician), diabetes educator and dietitian are important for managing the conditions. The aim of treatment is good blood glucose (glycaemic) control. A number of factors can influence glucose levels e.g. insulin injections, diet, exercise and illness¹. Poorly controlled coeliac disease can cause poor blood sugar control.

Consequences of Type 1 Diabetes

If type 1 diabetes is not managed appropriately, a number of consequences can result. Preventable complications of diabetes can cause unnecessary illness and sometimes death^{1, 16}. If blood glucose levels are consistently too high (hyperglycaemia), this increases the risk of diabetes complications including: Diabetic retinopathy (which may lead to poor vision and sometimes blindness), Diabetic nephropathy (renal disease), Diabetic neuropathy (nerve damage which may affect the feet, legs or gastrointestinal tract) and cardiovascular disease. Tight control of blood glucose levels and regular diabetes complications screening is essential to reduce the risk of these complications.

Hypoglycaemia occurs when blood glucose levels fall below 4mmol/l¹. This can be the result of a missed or delayed meal, not consuming enough carbohydrate at the last meal, being more physically active than usual, too much insulin or alcohol (especially if consumed on an empty stomach)¹. The signs of hypoglycaemia include sweating, shakiness, nausea, increased heart rate and irritability. If glucose levels continue to fall, brain function can be impaired, causing confusion, disorientation, slurred speech and increasingly disturbed and often aggressive behaviour. Eventually the person may become unconscious. Treatment for a "hypo" in the early stages involves ingesting approximately 15g of rapidly absorbed carbohydrate. If unconsciousness occurs, the person is extremely drowsy, unable to take direction and/

or having a seizure, do not give anything by mouth. Place them in the recovery position and call an ambulance, stating “diabetic emergency”. If available, give a glucagon injection. Glucagon is the hormone responsible for releasing stored glucose from the liver¹. Additional slower acting carbohydrate should be ingested following initial recovery. In the event of hypoglycaemia, treating quickly with enough carbohydrate is the priority. If a person has both coeliac disease and diabetes, they should not hesitate to eat or drink a food or beverage that contains gluten should they experience a hypoglycaemic episode when no gluten free carbohydrate alternative is available. The danger associated with hypoglycaemia outweighs the immediate risk associated with gluten ingestion.

The Coeliac Society

There is a Coeliac Society in each state to provide support and information on the disease, the gluten free diet, ingredients, where to buy, cooking and recipes, overseas travel, education and research material. Specific resources for children requiring a gluten free diet are available.

A booklet “Living with diabetes and coeliac disease” has been prepared by The Coeliac Society and Diabetes Australia, and is included with membership for those with both conditions. The nutrient content of the recipes printed in each issue of The Australian Coeliac magazine are also provided to aid those with diabetes in their food choices.

Membership in your state Coeliac Society is open to people diagnosed with coeliac disease, dermatitis herpetiformis and to those diagnosed as requiring a gluten free diet and their carers. A letter from a registered medical practitioner is required to verify the above. Health professionals, food manufacturers and those who cater for the gluten free diet are also welcome to join.

If you would like to become a member or would like more information, contact your state Society on 13 ZERO ZERO GLUTEN (1300 458 836) or visit www.coeliacsociety.com.au

For more information on the diagnosis and management of diabetes, please contact Diabetes Australia in your state or territory on 1300 136 588

For a complete list of references please contact your state society or visit our website coeliacsociety.com.au.

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The Coeliac Society of Australia Inc is not a medical organisation.

Persons reading this material should not act solely on it. The advice of a medical practitioner should always be obtained.

If you would like to become a member or would like more information, contact your state Society on 13 ZERO ZERO GLUTEN (1300 458 836).

www.coeliacsociety.com.au