

## Type 1 Diabetes and its Complications

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### ABOUT THE STUDY

Juvenile diabetes, also known as Type 1 Diabetes (T1D), is an autoimmune condition that develops when the immune system attacks insulin-producing cells. Insulin is a hormone that aids in controlling blood glucose levels and is necessary for the cells to use blood sugar for energy. Prior to treatment, this causes the body's blood sugar levels to be raised. Common symptoms of this elevated blood sugar include frequent urination, increased thirst, increased hunger, weight loss, and other serious issues [1]. Additional symptoms could include weariness, impaired eyesight, and slow wound healing. Symptoms generally start to show up fast, usually within a few weeks. Although its precise aetiology is uncertain, type 1 diabetes is assumed to be caused by a synthesis of inherited and environmental variables. The fundamental mechanism entails an autoimmune attack on the pancreatic beta cells that make insulin. Glycated haemoglobin (HbA1C) and blood sugar levels are used to diagnose diabetes. By checking for the presence of autoantibodies, Type 1 diabetes can be separated from type 2 diabetes [2].

### Complications

**Long-term consequences:** Long-term hyperglycemia damages the body's tiny blood vessels in addition to the acute complications of diabetes. Diabetic retinopathy, diabetic neuropathy, and diabetic nephropathy are the three conditions that result from this damage, which tends to emerge notably in the kidneys, nerves, and eyes. Long-term high blood sugar damages the retina's blood vessels in the eyes, making them more brittle. The average type 1 diabetic's lifespan is thought to be reduced by 8 to 13 years by cardiovascular disease, which is more common in those with type 1 diabetes [3]. Neuropathy and cardiovascular disease may both have autoimmune causes. Compared to males with type 1 DM, women had a 40% higher risk of dying. Clinical depression affects about 12% of type 1 diabetes patients. About 6% of persons with type 1 diabetes also have celiac disease, yet in most cases there are

no digestive symptoms or they are falsely blamed on inadequate diabetes management, gastroparesis, or diabetic neuropathy. Celiac disease is typically discovered after type 1 diabetes develops. The likelihood of complications including retinopathy and death is increased by the link between type 1 diabetes and celiac disease. Even if type 1 diabetes is identified first, this relationship can be explained by common genetic factors, inflammation, or nutritional deficits brought on by untreated celiac disease [4].

**Urinary tract infection:** Urinary tract infections occur more frequently in diabetics. The cause is diabetes nephropathy, which makes bladder dysfunction more prevalent in diabetics than in non-diabetics. When nephropathy is present, it can reduce bladder feeling, which can lead to greater residual pee and an increased risk of urinary tract infections [5].

**Sexual dysfunction:** Physical issues like nerve damage and poor circulation and psychological factors like stress and/or sadness brought on by the demands of the disease frequently combine to create sexual dysfunction in people with diabetes. Erection and ejaculatory disorders are the most prevalent sexual problems in men with diabetes. Diabetes can cause the blood arteries supplying the penis's erectile tissue to become rigid and constrictive, which prevents the sufficient blood supply required for a solid erection [6]. Retrograde ejaculation, which occurs when urine exits the penis and enters the bladder, is a result of the nerve damage brought on by poorly managed blood sugar levels. Semen leaves the body in the urine when this occurs. Reactive oxygen species produced as a result of the illness are a further reason for erectile dysfunction. This can be fought with the aid of antioxidants. Women with diabetes frequently experience sexual difficulties, such as diminished genital sensitivity, dryness, trouble orgasming, pain during sex, and decreased libido. Sometimes, diabetes causes females' oestrogen levels to drop, which may have an impact on vaginal lubrication. The relationship between diabetes and sexual dysfunction in ladies is less well understood than it is in males [7].

**Autoimmune disorders:** Persons who have type 1 diabetes are

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more likely to acquire many autoimmune conditions, including thyroid issues. About 20% of people with type 1 diabetes have hypothyroidism or hyperthyroidism, which is often brought on by Graves' disease or Hashimoto thyroiditis, respectively. 2-8% of persons with type 1 diabetes have celiac disease, which is more prevalent in white people and those who were younger when their diabetes was first diagnosed. Rheumatoid arthritis, lupus, autoimmune gastritis, pernicious anaemia, vitiligo, and Addison's disease are also more common in type 1 diabetics. On the other hand, type 1 diabetes is a symptom of complicated autoimmune diseases brought on by mutations in the immune system-related genes *AIRE*, *FoxP3*, or *STAT3* [8].

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