

Type 1 Diabetes (T1D) Risk Factors

T1D can develop at any age but occurs most frequently in children and adolescents, as such when T1D affects younger people it may be referred to as “Juvenile Diabetes”. With insulin the sole therapy, T1D is often also referred to as Insulin Dependent Diabetes. Approximately 5-10% of patients with diabetes are T1D. T1D is an autoimmune disease which occurs when the body does not produce enough insulin, the aetiology (cause) of T1D is not fully understood but it is believed to be as result of damage to the β -cells of the pancreas caused by immune cells called T-cells. Risk factors associated with T1D include both genetic and environmental factors.

Genetic factors: More than 50 T1D genetic risk loci have been identified by genome-wide association studies and meta-analyses. The main genetic mutations predisposing to T1DM are on the following genes, Insulin-VNTR, CTLA-4, PTPN22, AIRE, FoxP3, STAT3, IFIH1, HIP14 and ERBB3.

Environmental factors: The autoimmune response resulting in T1D can be triggered by viruses such as Rubella, Coxsackie B4, and enteroviruses. There is growing evidence associating the early introduction of cow’s milk in the infant’s diet with an increased risk for T1D, supporting ideas that infant’s exposure to insulin contained in the milk is triggering the autoimmune response. Early integration of cereals, nitrate exposure from water intake, inadequate intake of omega-3 fatty acids and vitamin D deficiency have also been implicated.

T1D Symptoms

Type 1 Diabetes often develops suddenly and can produce symptoms such as polydipsia (excessive thirst), polyuria (excessive passage of urine), enuresis (involuntary urination), lack of energy, extreme tiredness, polyphagia (excessive eating or appetite), sudden weight loss, slow-healing wounds, recurrent infections and blurred vision with severe dehydration and diabetes-related ketoacidosis in children and adolescents. Diabetes-related ketoacidosis occurs when the body breaks down fat much too fast to generate fuel to compensate the failure of insulin to supply glucose for energy. The liver processes the fat into a

fuel called ketones as an alternative source of energy, however high levels of ketones result in a dangerous condition called ketoacidosis, this causes the blood to become acidic, which can cause potentially fatal complications, such as severe dehydration, coma and swelling of the brain.

T1D Therapy and Management

Insulin is the mainstay therapy for T1D. New types of insulin, modern glucose monitoring, and insulin administration techniques have made it easier for insulin levels in patients with type 1 diabetes to more closely mimic those in healthy individuals. Insulin treatment can be rapid acting, short acting, intermediate acting and long acting, these may be administered via daily injections and/or insulin pumps which reduce the frequency of injections.

The use of non-insulin add-on treatment is a new trend. It has been successfully used in laboratories as well as clinical trials. Metformin is the most widely used drug, together with sodium-glucose co-transporters 2 (SGLT2) inhibitors, amylin analogues, glucagon-like peptide 1 (GLP-1) receptor agonists, and dipeptidyl peptidase-4 (DPP-4) inhibitors. The results of administration of these medications give good outcomes in patients with T1D.