

Preventing obesity in people with type 1 diabetes is a difficult but not impossible balance

October 1 2021

People living with type 1 diabetes (T1D), in which the pancreas produces little or no insulin, must use replacement insulin injections to manage their blood sugar, and this insulin therapy itself increases the risk of weight gain and later obesity.

However, the authors of a new review, published in *The Lancet Diabetes & Endocrinology* and presented at this year's online Annual Meeting of the European Association for the Study of Diabetes (EASD) as part of a special Lancet-EASD Obesity Symposium, say that it is possible for these patients to manage their [weight](#), while calling for more research into the specific needs of this patient group.

"The challenge for those living with T1D today is to simultaneously achieve [blood sugar](#) and [weight control](#), which is a difficult task as intensification of [insulin](#) therapy as their condition progresses is believed to be the biggest driver of weight gain," explains co-author Professor Bart Van der Schueren of University Hospitals Leuven, Leuven, Belgium.

For many years patients living with T1D, who represent around 10% of global diabetes cases, were thought to be only slim or of normal weight. However, people with T1D are being hit by the global obesity pandemic, just like the [general population](#), increasing the risk of heart attack, stroke and various cancers, among other conditions.

The review explores some of the possible reasons why insulin therapy itself puts T1D patients at higher risk of weight gain, including its potential to help the body 'conserve' calories as blood sugar control improves, and how injecting insulin means it bypasses the liver, possibly leading to overly high insulin concentrations in peripheral tissues that can affect body composition and lead to excess fat accumulation.

Another theory as to why [insulin therapy](#) causes weight gain is a central challenge that patients with type 1 diabetes face every day: avoiding hypoglycaemia (low blood sugar episodes). Many people with T1D employ 'defensive snacking' before a period of activity or exercise to ensure they are not at risk of hypoglycaemia. This can result in overconsumption, weight gain and obesity just as in any other person who consumes more calories than they use.

Various studies have specifically shown the detrimental effects of obesity in people with T1D. A study of some 26,000 patients with T1D (mean age 33 years; 45% women) registered in the Swedish National Diabetes Registry from 1998 to 2012 to assess the risk of death from cardiovascular disease (CVD), major CVD events, hospitalisations for heart failure (HF), and total deaths showed that risk of major CVD, HF, CV death, and mortality increased with increasing BMI, with associations more apparent in men than in women. Obesity can also increase the risk of many cancers and mental health problems in all people.

Unfortunately, specific goals and strategies do not yet exist regarding weight management in people living with T1D. Physical activity for example can leave patients worried about hypoglycaemia, as can any of the many calorie-restriction dieting plans available today.

The authors say: "One of the most effective strategies for preventing weight gain in people with T1D has proven to be the provision of

additional education regarding nutrition. This allows for more accurate tailoring of insulin doses to levels that mimic physiological levels, allowing insulin to be administered with maximum efficiency. However, resources to provide such education are lacking in many settings."

The authors also explore the use of adjunct (additional) therapies in managing weight in patients with T1D. Drugs commonly used as treatments for T2D such as metformin, and the much newer classes of drugs such as glucagon-like-peptide 1 (GLP-1) receptor agonists (including liraglutide) and the sodium glucose transport protein-2 (SGLT2) inhibitors have all been shown to produce weight loss in patients with T1D. Also discussed is pramlintide, a synthetic analogue of human amylin (secreted with insulin) that delays gastric emptying, suppresses glucagon secretion, and reduces food intake. However, these drug treatments can have side effects which must be taken into consideration.

Obesity surgery is also discussed in the review, and while this procedure massively reduces the complications of obesity in patients with T1D (such as cardiovascular disease or death) it can also increase the risk of hypoglycaemia and substance abuse. While overall results are encouraging, larger trials are needed in patients with T1D.

The authors also call for more research "to get a better grasp" of the exact prevalence of the abnormal and/or excessive accumulation of body fat in people living with T1D which eventually leads to overweight and obesity, to understand if and how these processes differ from people in the general population.

They say: "New treatments and technologies should focus not only on improving glucose control, but also on easing weight management in people living with T1D. The development of new insulins that better target the liver holds some promise, but better education and support for

people in regard to matching insulin doses to food intake and exercise could already go a long way to help people with T1D manage their weight."

They add: "Adjunct therapies which can improve blood sugar control through insulin independent pathways should also be further explored. More research is warranted to assess the exact magnitude of the negative effects on the overall health of people suffering from both overweight or [obesity](#) and T1D. The existing evidence already indicates that undesired weight gain is a reason for concern when treating people living with T1D, but better data are needed."

Provided by Diabetologia

Citation: Preventing obesity in people with type 1 diabetes is a difficult but not impossible balance (2021, October 1) retrieved 26 April 2024 from <https://medicalxpress.com/news/2021-10-weight-obesity-people-diabetes-difficult.html>

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