Body mass index is a more powerful risk factor for diabetes than genetics

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Losing weight could prevent or even reverse diabetes, according to late breaking research presented today at ESC Congress 2020.

In 2019, approximately 463 million people worldwide had diabetes, of which the vast majority (around 90%) was type 2 diabetes. Diabetes doubles the risk of coronary heart disease, stroke, and death from cardiovascular disease. Obesity is the main modifiable cause of type 2 diabetes, while genetic make-up may also identify individuals with a greater likelihood of developing the condition.

"Because we are born with our genes, it might be possible to pinpoint early in life who has a high chance of developing diabetes during their lifetime," said principal investigator Professor Brian Ference of the University of Cambridge, UK, and University of Milan, Italy. "We conducted this study to find out if combining inherited risk with current body mass index (BMI) could identify people at the highest risk of developing diabetes. Prevention efforts could then concentrate on these individuals."

The study included 445,765 participants of the UK Biobank. The average age was 57.2 years and 54% were women. Inherited risk of diabetes was assessed using 6.9 million genes. Height and weight were measured at enrolment to calculate BMI in kg/m^2. Participants were divided into five groups according to genetic risk of diabetes. They were also divided into five groups according to BMI.

Participants were followed-up until an average age of 65.2 years. During that period, 31,298 developed type 2 diabetes.

Those in the highest BMI group (average 34.5 kg/m^2) had an 11-fold increased risk of diabetes compared to participants in the lowest BMI group (average 21.7 kg/m^2). The highest BMI group had a greater likelihood of developing diabetes than all other BMI groups, regardless of genetic risk.

"The findings indicate that BMI is a much more powerful risk factor for

diabetes that genetic predisposition," said Professor Ference.

The investigators then used statistical methods to estimate whether the likelihood of diabetes in people with a high BMI would be even greater if they were overweight for a long period of time. They found that the duration of elevated BMI did not have an impact on the risk of diabetes.

Professor Ference said: "This suggests that when people cross a certain BMI threshold, their chances of diabetes go up and stay at that same high-risk level regardless of how long they are overweight."

He noted that the threshold is likely different for each person and would be the BMI at which they start to develop abnormal blood sugar levels. Professor Ference said: "The findings indicate that most cases of diabetes could be avoided by keeping BMI below the cut-off which triggers abnormal blood sugar. This means that to prevent diabetes, both BMI and blood sugar should be assessed regularly. Efforts to lose weight are critical when a person starts to develop blood sugar problems."

"It may also be possible to reverse diabetes by losing weight in the early stages before permanent damage occurs," said Professor Ference.

More information: Abstract title: Integrating the Effect of BMI and Polygenic Scores to estimate Lifetime Risk and Identify Optimal Treatment Targets to Prevent or Reverse Diabetes.

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