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Study challenges close link between recent weight gain, diabetes

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It is a common notion that type 2 diabetes is precipitated by substantial progressive weight gain, but a study published this week in *PLOS Medicine* suggests that this might not be true.

Dorte Vistisen and Kristine Færch, from the Steno Diabetes Center in Gentofte, Denmark, and colleagues analyzed data from participants of the Whitehall II cohort, a group of London-based civil servants who have been followed for more than a decade, to see what changes in body weight and other parameters had occurred in people in the years before they were diagnosed with diabetes.

6,705 participants were free of diabetes when they entered the study and are included in the analysis here. They were tested for diabetes every 5 years, and 645 of them were subsequently diagnosed with the disease. Going back to measurements of body mass index (or BMI, calculated using height and weight) which were recorded regularly, the researchers used a statistical method to identify patterns of change in BMI among individuals who went on to develop diabetes.

They identified three groups: by far the largest (comprising 606 individuals) were "stably overweight", and showed little change in their BMI over the years before they were diagnosed with diabetes. A second, much smaller group (15 participants) had gained weight continuously in the years before diagnosis. The remaining 26 participants were persistently obese for the entire time they participated in the study, in some cases for 18 years before they developed diabetes.

Because the three distinct patterns of obesity development were accompanied by different changes over time in insulin resistance and other risk factors for heart disease and diabetes, the authors conclude that "type 2 diabetes is a not a single disease entity, but rather a heterogeneous disease with different pathophysiological pathways depending on the level and development of obesity."

This study is the first one to apply this methodology to the question of how weight changes relate to the development of diabetes, and it used data from a homogeneous group of all-white civil servants. Before drawing firm conclusions on the process of diabetes development, it will be important to confirm the results in additional and more diverse populations.

Nonetheless, the results are provocative and should stimulate debate on how best to identify people at risk for diabetes and how to prevent the disease or delay its onset. The authors suggest that "strategies focusing on small weight reductions for the entire population may be more beneficial than predominantly focusing on weight loss for high-risk individuals."

More information: Vistisen D, Witte DR, Taba´k AG, Herder C, Brunner EJ, et al. (2014) Patterns of Obesity Development before the Diagnosis of Type 2 Diabetes: The Whitehall II Cohort Study. *PLoS Med* 11(2): e1001602. DOI: 10.1371/journal.pmed.1001602