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Press release

Deutsches Zentrum für Diabetesforschung
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Bariatric Surgery: Different Benefits for People with an Increased Risk of Diabetes

People with risk factors for type 2 diabetes have a varying risk of developing type 2 diabetes as well as complications. Researchers from the Institute of Diabetes Research and Metabolic Diseases of Helmholtz Munich at the Eberhard Karls University of Tübingen, the University Hospital of Tübingen, the German Center for Diabetes Research (DZD), as well as the Universities of Lille and Rome investigated the extent to which the different subtypes benefit from bariatric surgery. The results show that the novel classification of diabetes risk subtypes can help to identify people who benefit particularly greatly from bariatric surgery. This can be an important step towards precision medicine.

More than 2.5 billion adults worldwide are overweight or obese. Many develop type 2 diabetes (T2D) and other complications. Bariatric surgery is an effective treatment option for significantly reducing weight and reducing the risk of complications. However, it is still difficult to predict the benefits of bariatric surgery for people without T2D. Researchers from Germany, France and Italy investigated whether differences in metabolic improvements could be identified in people from different diabetes risk subtypes. They analyzed two cohorts of people who underwent bariatric surgery and a control group.

Classification into Diabetes Risk Subtypes before Bariatric Surgery
First, overweight people without T2D but at risk of diabetes (defined by an increased BMI, among other things) were assigned to the various diabetes risk subtypes*. "People with obesity who belong to subtypes 3, 5 and 6 have the highest risk of developing T2D and/or comorbidities," explains DZD researcher Leontine Sandforth from the University Hospital of Tübingen. Together with Violeta Raverdy from the University of Lille, she is the first author of the publication. Subtype 4 includes people who are overweight/obese with a low risk of diabetes. Subtypes 1, 2 and 3 usually have little or no excess weight and a lower risk of diabetes.

People in a cohort from Lille (France) and a cohort from Rome (Italy) underwent bariatric surgery. A control cohort in Tübingen (Germany) received a lifestyle intervention with behavioral change. To determine the success of the intervention, glucose regulation, prediabetes remission (normalization of glucose regulation), liver fat, insulin resistance and beta cell function were examined.

High-Risk Subtypes Benefit Significantly from Bariatric Surgery
The results: People with high-risk subtypes 5 and 6 benefited the most from bariatric surgery. Beta cell function and insulin sensitivity improved. In addition, blood sugar levels normalized (prediabetes remission) and liver fat was reduced. Moreover, the majority of high-risk groups transitioned to low-risk groups after bariatric surgery. This was not the case in the control cohort with lifestyle change counseling. Although relative weight loss was similar across all subtypes, surprisingly, participants from low-risk subtype 4 had a lower remission rate of prediabetes and thus benefited less in terms of improvement in blood sugar regulation.

Precision Medicine Approaches
“Our results show the relevance of the prediabetes classification for people with severe obesity. We were able to identify different reactions of the subtypes to bariatric surgery,” says Prof. Dr. Reiner Jumpertz von Schwartzenberg, summarizing the study. “These findings could help to advance precision medicine approaches in bariatric surgery.”

Participants in the study were:
- Institute for Diabetes Research and Metabolic Diseases of Helmholtz Munich at the University of Tübingen, Germany
- Internal Medicine IV, Endocrinology, Diabetology and Nephrology, University Hospital of Tübingen, Germany
- German Center for Diabetes Research (DZD), Germany
- University of Lille, INSERM, CHU Lille, Institut Pasteur de Lille, UMR 1190, Translational Research for Diabetes, European Genomic Institute for Diabetes, Lille, France
- CHU Lille, Integrated Center for Obesity, General and Endocrine Surgery, Lille, France

Key Messages:
- High-risk clusters 5 and 6 benefited more from bariatric surgery in terms of insulin resistance, beta-cell function and prediabetes remission.
- This study is perhaps able to help advance precision medicine in people at increased risk of type 2 diabetes and obesity.

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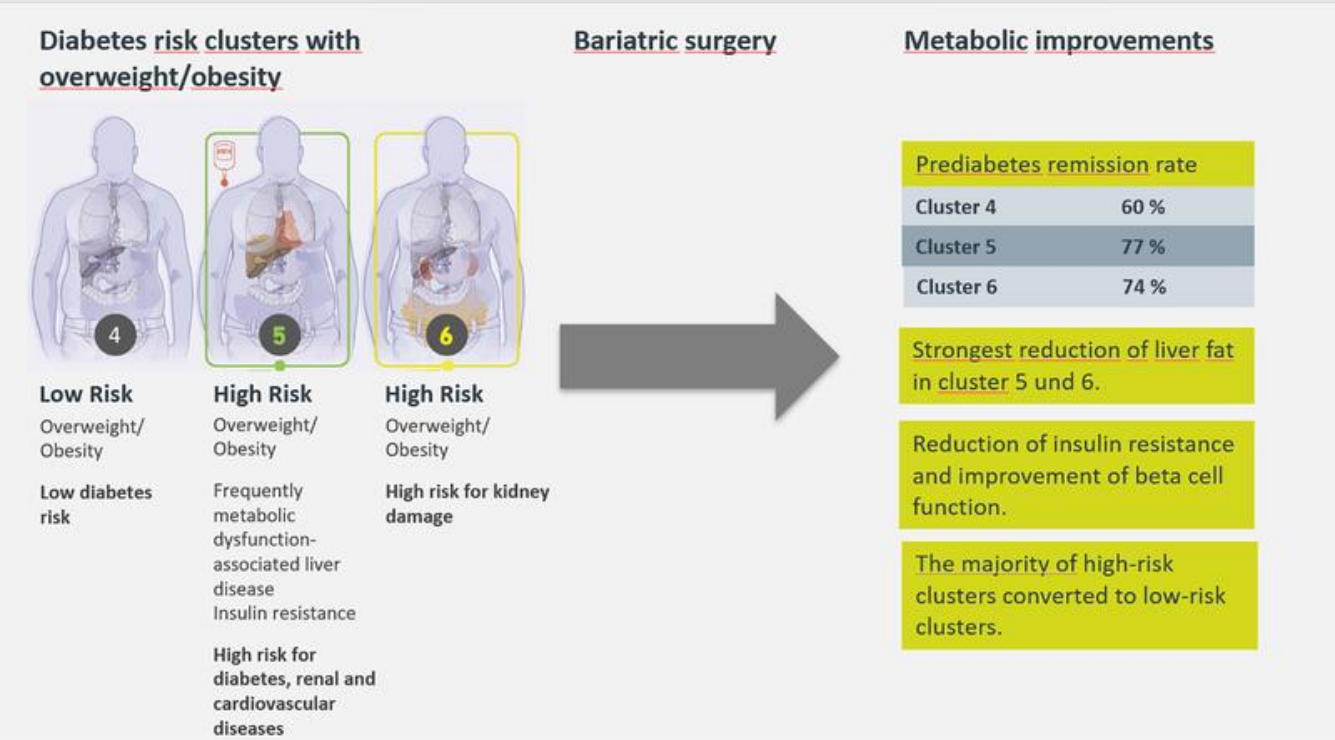
Sandforth L, Raverdy V, Sandforth A, Bauvin P, Chatelain E, Verkindt H, Mingrone G, Guidone C, Verrastro O, Zhou K, Archid R, Mihaljevic A, Caiazzo R, Baud G, Marciniak C, Chetboun M, Ganslmeier M, Minelli Faiao V, Heni M, Fritsche L, Moller A, Kantartzis K, Peter A, Lehmann R, Wagner R, Prystupa K, Fritsche A, Stefan N, Preissl H, Birkenfeld AL, Jumpertz von Schwartzenberg R, Pattou F. Subphenotype-Dependent Benefits of Bariatric Surgery for Individuals at Risk for Type 2 Diabetes. Diabetes Care, 2025 Apr 11:dc250160 doi: 10.2337/dc25-0160. PMID: 40214701.



High-risk subtypes benefit bariatric significantly from surgery
DZD