PRESS RELEASE

**A New Diabetes Classification? Subgroups of Type 2 Diabetes have Specific Risk of Diabetes-Associated Diseases such as Fatty Liver and Neuropathy**

**Recent studies provide evidence for an updated diabetes classification reflecting different risks for diabetes-related complications. Researchers at the German Diabetes Center (DDZ) and their partners from the German Center for Diabetes Research (DZD) and the University of Lund in Sweden have now identified clusters allowing for the separation of different diabetes subtypes. Two of these subtypes are at higher risk of fatty liver disease and diabetic neuropathy early on after the diagnosis of diabetes. In line with the concept of precision medicine, these findings illustrate the need for targeted diagnosis and treatment for these patients’ subgroups in order to delay or even prevent diabetes-related complications.**

**Düsseldorf (DDZ)** – The traditional classification of diabetes, mainly in type 1 and type 2 diabetes, has been challenged by studies from Scandinavia. In the current issue of *The Lancet Diabetes & Endocrinology*, researchers from DDZ together with colleagues from DZD and University of Lund published a cluster analysis of diabetes allowing for phenotyping into subgroups, which extended the findings by showing that risks of certain diabetes-related complications segregated between diabetes subgroups already during the first five years after diagnosis. These results come from the prospective observational multicenter German Diabetes Study (GDS), which follows people with newly diagnosed diabetes for more than 10 years.

"The new subgroups will help to develop precise prevention and tailored treatment strategies for the respective high-risk groups," said Professor Michael Roden, principal investigator of GDS and director of DDZ and of the Division of Endocrinology and Diabetology at University Clinics of Düsseldorf. "This is an important step into precision medicine for diabetes and its comorbidities."

**Analysis and results**

The GDS is conducted at eight locations throughout Germany within DZD, led by DDZ ([www.deutsche-diabetes-studie.de](http://www.deutsche-diabetes-studie.de)). For this analysis, 1105 participants underwent cluster analyses based on the predictive marker GADA (glutamate decarboxylase antibody), age at diagnosis, body mass index (BMI), HbA1c level and HOMA indices (homeostasis model assessment) for insulin sensitivity and insulin secretion. The researchers tested whether comprehensive phenotyping validates and further characterizes these clusters at diagnosis and during follow-up. They also analysed whether relevant complications and comorbidities associated with diabetes, including non-alcoholic fatty liver disease (NAFLD), liver fibrosis and diabetic neuropathy, differ among these clusters during the five-year follow-up period. Based on the cluster algorithm, different subgroups with differing risks of complications could be identified: mild age-related diabetes (MARD, 35%), mild obesity-related diabetes (MOD, 29%), severe autoimmune diabetes (SAID, 22%), severe insulin-resistant diabetes (SIRD, 11%) and severe insulin-deficient diabetes (SIDD, 3%). The results show that two subgroups in particular have a high risk of complications. The highest risk of developing non-alcoholic fatty liver was in the cluster of "severe insulin-resistant diabetes" (SIRD); for diabetic neuropathy, the highest risk was in the subgroup "severe insulin-deficient diabetes" (SIDD).

**Conclusion**

Using the new diabetes classification, people with type 2 diabetes can be assigned to specific subgroups that exhibit significant metabolic changes and differing risk patterns for the development of diabetes-related complications. Individually targeted prevention and early treatment of specific subgroups of people with diabetes is a step towards precision medicine to delay or even prevent secondary diseases.

**German Diabetes Study (GDS)**The aim of the German Diabetes Study is to identify markers for different forms of diabetes at an early stage in order to develop and apply new concepts for the prevention and treatment of secondary diseases. In this way, early warning signs of diabetes complications can be detected, and approved therapy methods can be compared in parallel. This study will also investigate the influence of genes on the course of the disease. Participants in the German Diabetes Study receive free screenings for early detection of diabetes-associated diseases such as nerve, vascular and retinal damage. If you are interested in taking part in the study, please contact the Clinical Study Center at the German Diabetes Center (DDZ) at +49 (0)211/3382 209 or send an e-mail to [studienzentrum@ddz.de](mailto:studienzentrum@ddz.de).

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**Photo reference:**1. Graphic of the new subphenotypes from the German Diabetes Study.  
2. Logo German Diabetes Study (GDS).

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The German Diabetes Center (DDZ) serves as the German reference center for diabetes. Its objective is to contribute to the improvement of prevention, early detection, diagnosis and treatment of diabetes mellitus. At the same time, the research center aims at improving the epidemiological data situation in Germany. The DDZ coordinates the multicenter German Diabetes Study and is a point of contact for all players in the health sector. In addition, it prepares scientific information on diabetes mellitus and makes it available to the public. The DDZ is part of the Leibniz Association (Wissenschaftsgemeinschaft Gottfried Wilhelm Leibniz, WGL) and is a partner of the German Center for Diabetes Research (DZD e.V.).

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