

High prevalence of restrictive lung disease in people with type 2 diabetes

July 12 2018

Breathlessness and conditions of restrictive lung disease (RLD), such as pulmonary fibrosis, may be a late complication of type 2 diabetes. These are the key findings of a joint study undertaken by researchers from the German Center for Diabetes Research (DZD) and the German Center for Lung Research (DZL) under the leadership of the University Hospital Heidelberg. The latest results have been published in the journal *Respiration*.

One in four patients in outpatient treatment settings suffer from breathlessness. Acute and [chronic lung diseases](#) are usually the main causes. Studies show that many people with interstitial [lung disease](#) (IDL) also suffer from type 2 [diabetes](#). But do patients with type 2 diabetes also have a higher incidence of lung and respiratory diseases? Could breathlessness, IDL and RDL be a consequence of diabetes? These questions were investigated for the first time in a study by researchers from the German Centre for Diabetes Research (DZD) and the German Centre for Lung Research (DZL) at Heidelberg University Hospital.

The research team, headed by Dr. Stefan Kopf, comprised 110 patients with long-term type 2 diabetes, 29 patients with newly diagnosed type 2 diabetes, 68 patients with pre-diabetes and 48 non-diabetic patients (controls). The study participants were examined for metabolic control, diabetes-related complications, breathlessness, and [lung function](#). It was found that people with type 2 diabetes are significantly more likely to suffer from breathlessness and RLD than the control group. RLD was

found in 27 percent of patients with long-term type 2 diabetes, in 20 percent of patients with newly diagnosed diabetes, and in 9 percent of patients with pre-diabetes. Patients with pronounced symptoms and RLD also showed CT-morphologically a fibrosating [interstitial lung disease](#). There were also differences in the morphological analysis of the lung tissue of subjects with and without diabetes. Patients with diabetes had increased pulmonary fibrosis.

In addition, the study showed that RLD is associated with albuminuria. In the disease, urinary albumin levels are elevated. This may be an indication that lung disease and kidney disease may be associated with diabetic kidney disease (nephropathy).

"Increased breathlessness, RLD, and interstitial lung anomalies can be associated with type 2 diabetes," said first author Stefan Kopf, MD, of the Department of Endocrinology, Diabetology and Clinical Chemistry at University Hospital Heidelberg, summarizing the study results. "In this study, the prevalence of RLD was 20 to 27 percent in [patients](#) with diabetes. Moreover, the radiological and histological analyses suggest an association with fibrosing interstitial lung anomalies," added Professor Hans-Ulrich Kauczor, MD, Medical Director of Diagnostic and Interventional Radiology at University Hospital Heidelberg.

"The current study as well as findings from animal experiments show a significant connection between restrictive lung diseases and diabetes mellitus," said Professor Michael Kreuter, MD, of the Thorax Clinic / University Hospital Heidelberg. "We therefore suspect that [lung disease](#) is a late consequence of type 2 diabetes," said last author Professor Peter P. Nawroth, MD, medical director of the Department of Endocrinology, Diabetology and Clinical Chemistry at University Hospital Heidelberg and member of the Scientific Advisory Board of the DZD. Patients with diabetes, nephropathy and breathlessness should therefore be examined regularly for RLD.

More information: Stefan Kopf et al, Breathlessness and Restrictive Lung Disease: An Important Diabetes-Related Feature in Patients with Type 2 Diabetes, *Respiration* (2018). [DOI: 10.1159/000488909](https://doi.org/10.1159/000488909)

Provided by Deutsches Zentrum fuer Diabetesforschung DZD

Citation: High prevalence of restrictive lung disease in people with type 2 diabetes (2018, July 12) retrieved 5 May 2024 from <https://medicalxpress.com/news/2018-07-high-prevalence-restrictive-lung-disease.html>

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