

Letters to the Editors

Olfactory Dysfunction: Etiology, Diagnosis, and Treatment

by Prof. Dr. med. Thomas Hummel, Prof. Dr. med. David T. Liu, Prof. PD Dr. med. Christian A. Müller, Prof. Dr. med. Boris A. Stuck, Prof. Dr. med. Antje Welge-Lüssen, and Prof. Dr. med. Antje Hähner in issue 9/2023

Diabetes Mellitus, Kidney Disease, and Sense of Taste

In addition to the outstanding review article by Prof. Hummel and colleagues (1) we would like to mention a recent review on the topic of genetic causes of congenital hypogonadism which describes in detail how dysfunction in the sense of smell is connected to certain genetic defects such as mutations in the genes ANOS1, SOX10, FEZF1, NDNF, TUBB3, and others (2). Furthermore, amongst endocrinological disorders diabetes mellitus can be associated with olfactory dysfunction, especially in patients with diabetic late complications. This might in part explain why patients with chronic or end stage renal disease also often have olfactory deficits, as the main reasons for chronic kidney disease are diabetes mellitus and/or hypertension (3). In a proof of concept, open-label clinical trial using the application of intranasal theophylline, more than 70% of patients with chronic kidney disease stage 4/5 showed an improvement in their sense of smell. A renal transplant in patients with chronic renal disease can also normalize the sense of smell in such patients and have a positive impact on their quality of life and social life. As pointed out by Prof. Hummel and colleagues when relating to the retro-nasal route in the perception of complex aromas and the so-called “fine taste”, the sense of smell and the sense of taste are closely interconnected with each other. Springer Verlag has published a special guest issue on the topic “The Sense of Taste in Endocrinology” in the journal *Reviews of Endocrine and Metabolic Disorders* (4). Similar to patients with mild cognitive disturbances in whom a reduction in the sense of smell counts as a

sign for conversion to dementia, assessing the ability and intensity of the sense of smell in patients with diabetes mellitus and impaired renal function may be helpful, considering that diabetic patients often suffer microinfarctions of brain and heart which can promote the development of dementia if a cerebral infarction occurred in the frontotemporal region.

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Conflict of interest statement

The authors declare that no conflict of interest exists.

In Reply:

It is the nature of the game that for reasons of space, not everything can be explained in a review article—for this reason we thank Koch, Dreisbach, and Fulop for their additional comments on our article (1). At this point we should immediately point out that diabetes mellitus is often—but by no means always—associated with olfactory dysfunction (2) and that olfactory dysfunction is not considered an early indication of diabetes mellitus (3)—although unexplained olfactory dysfunction can be an preliminary indication of cognitive impairments (3). As regards the effectiveness of theophylline, controlled and randomized trials are lacking, with the result that to date, theophylline is not considered as sufficiently proved according to relevant international consensus work (4)—among other reasons, in spite of the mentioned and very interesting open label clinical study. In this context the results of further studies of the treatment of olfactory dysfunction are eagerly awaited. We thank our correspondents once more for their additional comments—the treatment of olfactory dysfunction is currently a very dynamic area.

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