6. Conclusion

The development of PD is accompanied by loss of olfaction. We analyzed the diagnostic role of olfactory testing with the 16 Sniffin’ sticks odor identification test in PD patients compared to HC within the framework of the ParkCHIP study. For this analysis we used a subgroup of all patients subjected to stringent diagnostic criteria (ParkCHIP I). The Sniffin’ sticks test allowed for a quick testing with high specificity (90%) and moderate sensitivity (28%). This simple and cheap test can contribute to the diagnostic workup as a point-of-care test. Even a subset of only three odors consisting of coffee, peppermint and anise out of the full set of the Sniffin’ sticks test yielded a good performance with regard to discrimination between PD patients and HC. We could show that olfactory dysfunction is a robust and frequent symptom in PD and discriminates well between HC and PD.

Furthermore, we analyzed whether self-assessment of olfaction is a reliable question in the anamnesis of patients in the diagnostic workup for PD. In the analysis of the full set of PD patients recruited for ParkCHIP (ParkCHIP II) we found self-assessment to hold the risk for underestimation. Thus, self-assessment of olfactory ability is not a reliable measure for olfactory function and is not an appropriate replacement for olfactory testing.

We found that the olfactory impairment was not associated with PD subtype.

The diagnostic accuracy of PD is still subject of concern. We carefully explored the characteristics of 13 patients with normal olfaction (ParkCHIP III) to find evidence of diagnostic problems. We found a lower response to L-DOPA and characteristics (such as younger age at onset, comorbidities and medical treatment) in the majority of these patients indicating a probable misdiagnosis of PD or special PD cases respectively.

People diagnosed with impaired olfaction but no further symptoms can be easily followed over the years or one can even proceed with more detailed and cost-intensive diagnosis such as neuroimaging. In addition, a more specific assessment
of the potential occurrence of mild motor symptoms can be conducted. Misdiagnosis of PD contributes to high costs for the society/economy and causes profound burden for the patient in terms of missing special treatment and final diagnosis.

With PD being the second most common neurodegenerative disease and its chronic progression of symptoms there are about 300,000 PD patients in Germany who need qualified care and correct medical treatment. Using rough estimates and calculate with a false positive rate of only 10% (30% in literature) we found the annual indirect and direct cost to sum up to more than 600,000,000 € per year. A cheap, non-invasive and easily applicable test as the Sniffin’ sticks test, with high specificity and consequently a little amount of wrong positive results is substantial. In addition, the Sniffin’ sticks odor identification test could even be applied by medical assistants or nurses and does not require a doctor’s presence. With costs for the 16 pen containing Sniffin’ sticks test of 149 € and a minimum durability of 18 month the calculated costs per testing are rather low. It is fundamental for both, the patients and the economy to incorporate olfactory testing in the clinical routine.