

## **Abstract**

Gait and balance disorders and the resulting falls are a substantial part of Parkinson's disease (PD) and other movement disorders. Especially in the late stage of PD more than 80 % of the patients fall. History of falls remains the best predictor of falls nonetheless, but it can not be used in falls prevention. Dopaminergic pharmacotherapy improves postural stability and gait in PD only in the early stage and the dopaminergic responsiveness of these symptoms decreases significantly during the disease progression. The impact of this medication on future falls risk remains still unclear. The connection between balance and gait disorders and cognitive impairment in PD is also not fully understood. The current state of knowledge about gait and balance disorders and cognitive impairment in PD is not satisfactory. Therefore the aims of the experimental part of this thesis were prospective monitoring of risk factors and predictors of falls, observation of the impact of dopaminergic medication on future falls risk and verifying the relationship between gait and balance disorders and cognitive impairment in PD. The fourth aim of the thesis was to specify the type and severity of gait and balance disorders in patients with essential tremor (ET). Although ET is one of the most common neurological disorders, its prevalence, type and severity are not known yet.

The results of this thesis describe the causes and risk factors of falls and demonstrate that the most significant predictor of falls is stride time variability and cadence in OFF medication state (i.e. after the withdrawal of all dopaminergic medications). The results also show that only instrumental gait assessment parameters in OFF medication state predict future falls in PD patients. Furthermore they highlight a close relationship between the severity of cognitive impairment (dementia syndrome) and motor impairment in PD, i.e. postural instability and upper extremity motor impairment. The conclusions of the ET study prove a subclinical balance and gait disorder in ET patients without subjectively evaluated instability in stance and gait and point to the role of the functional or neurodegenerative cerebellar impairment. Therefore, these disorders should be assessed and targeted, as they might interfere with functional mobility in activities of daily living, especially in elderly patients with longer disease duration.