Aims: Reflexive and voluntary saccades were studied in 30 patients with early-stage Parkinson's disease (PD) and 30 age-matched control subjects.

Methods: Reflexive saccades were initiated by the sudden appearance of visual stimulus. Voluntary saccades generated by internal goals during constant visual stimuli presentation. Eye movements were recorded using electrooculography and a video based eye tracker.

Results: PD patients exhibited different eye movement characteristics to control subjects. The mean latency of reflexive saccades was significantly longer in the patients than in the control group. Moreover, PD patients produced a lot of multistep saccades. The changes in saccadic eye movement characteristics were more pronounced on the side of the clinical symptoms in patients with stage I (by Hoehn and Yahr’s scale). In the voluntary saccade task patients and control subjects also showed different results. PD patients had longer initiation time in the beginning of each trial, longer fixation time between voluntary saccades and made less eye movements during the task.

After four weeks of dopamine agonist therapy the state of PD patients was improved. At the same time the characteristics of reflexive saccades were changed: the mean saccade latency and the percentage of the multistep saccades significantly decreased. The percentage of multistep saccades correlated with the neurological status of a patient (r = 0.7, p< 0.05).

Conclusion: Our results show that saccadic eye movement exploring may be used as a promising technique for PD diagnostics and control of treatment.

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