G2019S penetrance resulted much higher (85% at 70 years), but it was carried out in cases selected by strong familiarity. The present study might provide more reliable estimates, being based on an unselected series.

P956

Transcranial sonography of substantia nigra and MIBG myocardial scintigraphy in patients with early Parkinson's disease

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Objective: The purpose of this study is to evaluate SN echogenicity in outpatients who came to our hospital and were clinically diagnosed as having early PD.

Background: In patients with Parkinson's disease (PD), a hyperechogenicity of the substantia nigra (SN) can be demonstrated by transcranial sonography (TCS). The clinical significance of TCS has not yet been determined in Japanese PD patients.

Methods: The subjects were nineteen patients who were clinically diagnosed as having possible PD at the initial visit. TCS was performed to assess the degree of SN hyperechogenicity. Metaiodobenzylguanidine (MIBG) myocardial scintigraphy, a marker of Lewy body disease, was also performed. The obtained findings were assessed with disease stage according to the Hoehn-Yahr scale, and the unified Parkinson's disease rating scale (UPDRS).

Results: We could not detect the midbrain by TCS in ten patients (53%). In all the nine patients in whom the midbrain was clearly detected, SN hyperechogenicity was definitely observed. In seven of them, the area of SN hyperechogenicity was larger in the SN contralateral to the parkinsonism-predominant side. In eight of the nine patients who showed SN hyperechogenicity, myocardial MIBG uptake was reduced. There was no correlation between the heart/mediastinum (H/M) ratio and the area of SN hyperechogenicity.

Conclusions: The present findings may support the hypothesis that SN hyperechogenicity is a possible test for making diagnosis of PD. Because in early PD patients, a reduction of myocardial MIBG uptake is not always observed, the combination of TCS and MIBG myocardial scintigraphy may contribute to increasing the specificity of an early diagnosis of PD. On the other hand, the high rate of recording failure of SN by TCS in Japanese patients may limit the clinical usefulness of TCS.

P957

Behavioral and psychiatric manifestations following deep brain stimulation of the subthalamic nucleus in Parkinson's disease: Are they really rare?

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Objective: To evaluate the diversity and severity of behavioral and psychiatric symptoms evolving in patients with Parkinson's disease (PD) following deep brain stimulation of the subthalamic nucleus (STN-DBS), in relation to preexisting manifestations.

Background: While early data supported the relative safety of STN-DBS in PD, recent reports of behavioral sequelae call for a re-evaluation of the scope of these symptoms.

Methods: All PD patients after STN-DBS were evaluated for their present and retrospectively for the preoperative symptoms. The patients were rated using the neurobehavioral rating scale (NRS) and the Beck depression inventory (BDI). In addition, the caregivers were interviewed using the neuropsychiatric inventory (NPI), the NRS, 3 items addressing components of the dopamine dysregulation syndrome (DDS) and the work social adjustment scale (WSAS). A clinician's global impression of change (CGIC) was obtained separately for motor (CGIC-M) and behavioral (CGIC-B) status. The paired Wilcoxon signed ranks test was used to compare the rating scale scores.

Results: Twenty-five patients (17 males, age: 60.7±10.2 years) were evaluated 23.5 (10-31)[median (interquartile range)] months after surgery. Prevalence of moderate to severe depression increased from 31.8% to 59.1% after DBS. One patient had persistent severe depression requiring ECT and another committed suicide. A number of patients experienced novel manifestations after DBS (psychosis in three, DDS in two, suicide ideation in three, anxiety in five and apathy in five). The severity of behavioral symptoms had increased [median (interquartile range), p value] in terms of the neurobehavioral(NRS 15 (8-29), Vs. 22.5(12-48), 0.021), neuropsychiatric (NPI 3.3(2-6) vs. 5(4-14), 0.003) symptoms, but not in social functioning (WSAS). The percentage of patients with DDS score≧1 changed from 20% to 36%, p=0.009. No correlation was found between motor and behavioral outcomes according to the CGIC-M and CGIC-B.

Conclusions: STN-DBS may be associated with exacerbation of preexisting neuropsychiatric and behavioral manifestations as well as onset of new symptoms. Further research should focus on ideentifing predisposing factors to those complications in candidates for DBS.

P958

Synchronization of right-left stepping while walking is compromised in patients with Parkinson's disease during mental loading

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Objective:To examine the effect of mental loading on bilateral coordination of gait in Parkinson's disease (PD) patients.

Background: The relationship between cognitive function and gait in Parkinson's disease is not well-understood. Impaired bilateral coordination was found as a marker of gait disturbances in PD patients, e.g. with relation to freezing. Mental loading is also associated with the exacerbation of gait in PD, e.g. gait becomes more variable. Here we study if bilateral coordination of gait will be effected by mental loading.

Methods: Sixteen PD patients (H&Y: 2-3), were compared to age and gender-matched healthy controls (n=11). Subjects wore force-sensitive insoles that measured the timing of each gait cycle during comfortable walking and during walking with simultaneous mental loading (serial 7 subtractions). Bilateral coordination of gait was evaluated by quantifying the phase relationship between left and right heel-strikes with respect to the stride duration. For each subject, the sum of the coefficient of variation of the phase and the mean absolute difference between the phase and 180° was defined as the phasing coordination index (PCI) representing variability and accuracy, respectively, in phase generation. Higher PCI values reflect less coordinated phase generation. Synchronization between the two legs was characterized by phase synchronization analysis (Poincare method). For each subject, the synchronization index ρ was calculated

(ρ=1 and ρ=0 correspond to maximal- and to no-synchronization, respectively).

Results: See table.

Conclusions: Left-right stepping is less synchronized among PD patients in comparison to elderly subjects. Impaired synchronization became more aggravated when PD subjects performed a secondary mental task. Perhaps this reduced coordination, especially when mentally challenged, contributes to the increased fall risk common to patients with PD.

PCI and ρ (mean± SE) with and without mental loading. Entries in arbitrary units

	PD		Control	
Condition	PCI	ρ	PCI	ρ
Usual Walking	7.4 ± 1.0*	0.54 ± 0.01*	4.6 ± 0.3	0.59 ± 0.02
Dual task	11.0 ± 1.4*	0.49 ± 0.02*	5.2 ± 0.6	0.58 ± 0.02
P value	0.0002	<0.0001	0.33	0.30

TABLE 1 (P958). Effect of mental loading on coordination and synchronization of gait

*Difference between PD and Controls: p<0.05

P959

High frequency stimulation of the subthalamic nucleus differently affects D1 and D2 dopaminergic receptor densities within basal ganglia nuclei in intact and hemiparkinsonian rats

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High frequency stimulation (HFS) of the subthalamic nucleus (STN) is an effective treatment for advanced Parkinson's disease (PD) but the