INTRODUCTION

Parkinson’s disease (PD) is a complex neurodegenerative condition manifested by characteristic motor impairment and a wide array of non-motor symptoms (NMS) (1, 2). Recently, sleep, fatigue, mood, cognition, pain and autonomic disorders have been recognized as important components of the disease, with a consistent impact on patients’ health and quality of life (3, 4, 5, 6, 7). Despite these problems and the high burden of NMS in most patients (4, 8) NMS remain frequently neglected (9) or undocumented (10). NMS thus present one of the biggest challenges for management by the clinician and a comprehensive assessment that includes NMS as well as motor state of the patient is essential (11). NMS can be assessed by several tools specifically designed for these symptoms, including the NMS questionnaire (NMSQuest)(12), the unified PD rating scale (UPDRS)(13) and the PD sleep scale (PDSS) (14). Pathophysiological, NMS may be related to both dopaminergic and non-dopaminergic alterations. For example, PET studies reported dopamine dysfunction at the hypothalamus (15). Degeneration of cholinergic, adrenergic or serotonergic pathways could also contribute to NMS genesis (16). Moreover, NMS can precede motor symptoms and thus PD diagnosis (17). Some studies suggest that NMS are common in all stages of PD and more common as the motor symptoms progression regardless of age of onset, levodopa dosage or disease duration. The most prevalent NMS in this study were highly similar to other previous international studies using the 30-item NMSQuest (18, 19 and 20). Non-motor symptoms dominate the clinical picture as PD progresses and may also contribute to shortened life expectancy (2, 21). Most do not respond to, and may be exacerbated by, dopamine replacement therapy (22). NMSs also account for the burden of hidden costs such as sick leave, early retirement and informal care not only for patients but also for caregivers in certain instances. The cost burden of NMSs is significantly high, especially in patients with advanced PD and increasingly severe symptoms, for which there is a poorer quality of life, reduced productivity and a greater need for health-care services, which in turn have an impact on direct and indirect costs. Thus, identifying disease-modifying treatments early in...
the disease, before any functional or motor disability appears, is critical in reducing costs and preserving quality of life. Evidence suggests that initial therapy with non-levodopa agents is cost-effective, prolongs time to levodopa initiation and delays the onset of dyskinesia (23). There is a significant interrelationship of severity of disease, quality of life, patients and caregiver's burden, and cost of illness. NMSs contribute to the overall PD burden, which is a major determinant of quality of life. An increasing awareness of 'at-risk' individuals, based on detection of some or a combination of NMSs, is essential for an early identification of PD patients. Identification of prodromal patients plays a key factor in preventing the burden of economic costs and improving quality of life of patients and caregivers. Keeping this in mind, it becomes important to optimize the management of all aspects of NMSs in PD (24). Therefore we conducted our study to evaluate the high prevalence of non-motor symptoms in PD patients, particularly those measured by UPDRS Part I as it is one of the most used clinical scales in PD and thus with great clinical significance.

OBJECTIVE

To show the high prevalence of mentation, behavior and mood disorders as measured by UPDRS Part I in PD patients.

MATERIAL AND METHOD

293 out patients with PD (129 men and 164 women) aged 58-79, all retired due to illness (PD), randomly selected in terms of different PD stages for an 8-year period (2005-2012) were investigated after the inform consent was signed. They were outpatient recruited from a PD center of Department of Neurology and Psychiatry. The patients received L-DOPA, dopamine agonists and antioxidants. The same team member who performed the clinical diagnosis also applied the scale. The patients have not been researched for concomitant illnesses. The study used the following assessment tools:

I. Unified Parkinson's disease Rating Scale (UPDRS) - Part I: evaluation of mentation, behavior, and mood. UPDRS is the most used scale to follow the longitudinal course of PD. (16, 17)

II. Modified Hoehn and Yahr scale for assessment of clinical symptoms;

III. Schwab and England Activities of Daily Living Scale; Modified Hoehn and Yahr scale for assessment of clinical symptoms and Schwab and England Activities of Daily Living Scale are parts of UPDRS, but are mentioned separately because were used alone in the process of diagnosing the disease. The complete UPDRS was used latter for the measurement of the progression of the disease.

IV. Statistical methods for processing the data received – SPSS 11 software with analysis of variances and alternates was used.

RESULTS

MENTATION, BEHAVIOR AND MOOD.

1. Intellectual Impairment. That symptom was observed in 199 patients (67.9%). No significant gender-related differences were found. From Part 1 of UPDRS the item 1 - “light consistent forgetfulness with partial recollection of events with no other difficulties” and the item 2 – “moderate memory loss with disorientation to time and often to place, severe impairment of solving problems” were considerably prevalent as compared to the item 4 “severe memory loss with orientation only to person” (p<0.05%) (Table 1).

2. Thought disorder: Thought disorder was found in 79 patients (26.9%). The item 2 - “benign hallucinations “with retained insight was most frequently observed. The item 3 – “Frequent hallucinations or delusions were almost equally frequent. Then came the item 1 - “vivid dreaming”, while persistent hallucinations and delusions were the least frequent. No significant gender-related differences were found (Table 2).

3. Depression (depression symptoms) the item 2 – “sustained depression, lasting more than a week was the most frequently observed in both genders. It was found in 90 patients (30.7%), followed by the item 1 – “periods of sadness and guilt”. Their values increased significantly as compared to the item “long-term depression with vegetative symptoms and suicidal thoughts or intentions” (p<0.05%) (Table 3).
4. Motivation/Initiative. Lack of motivation and loss of initiative were most frequent among the PD patients. Those symptoms were found in 245 patients (83.6%). They were less assertive and more passive. Complete loss of motivation was the least frequent, the low results being statistically significant as compared to the milder impairment stages (p<0.01%) (Table 4). Apathy was observed in 54% of the patients diagnosed with mild to moderate PD related depressive symptoms.

**CONCLUSIONS:**
This study showed moderate to high prevalence of non-motor neuropsychiatric disturbances in patients with PD in different stages of the disease as measured by the UPDRS Part I. This confirms that they are important part of the disease. Therefore, treating physicians should look for them routinely in their effort for the improvement of quality of life in patients with PD. The UPDRS showed that it is sensitive and reliable tool for detecting such symptomatology.

**DISCUSSIONS:**
As PD is a multidimensional disorder, the disease progression and treatment efficacy should be assessed not only through motor symptoms but also through psychopathological and autonomic symptoms. The Unified Parkinson's Disease Rating Scale (UPDRS) was developed as a brief, valid, and reliable scale for the assessment of activities and non-motor symptoms in PD and has replaced many of the older assessment scales. (25, 26) Cognitive disorders in PD consist first of an intellectual slowing and difficulties to organize and manage the intellectual capacities, with preservation of global cognitive efficiency for long time.(27) Eventually, these disturbances can increase with the time and even progress to dementia. It is important to distinguish mild cognitive impairment from dementia, the latter being present only in a moderate percentage of PD patients. Our results revealed high prevalence of intellectual impairment (67.9%) as measured by the UPDRS which underlines the significance of its early recognition.

Hallucinations occur usually in a normal state of consciousness, without delirium, and have a chronic course. (28) The prevalence of complex visual hallucinations ranges from 22 to 38%.(29) Risk factors for hallucinations are older age, long duration of the disease, cognitive impairment, severity of PD symptoms, sleep disorders (somnolence), and visual disorders. (30) Risk of psychotic symptoms is increased in late onset PD, in patients taking high doses of dopaminergic drugs and suffering of REM sleep behavior disorder (RBD). Hallucinations must be identified by systematically questioning the patient. Visual hallucinations are surprising, but their intensity is quite variable. Benign hallucinations are limited to presence sensation, passing lights or visions at periphery of the visual field, with great tolerance by the patient. (31) Our results showed moderate frequency of thought disorder in our study population. Thought disorder was found in 79 patients (26.9%) and the item “benign hallucinations “with retained insight was most frequently observed.

Depression occurs at any stage of the disease, even at the beginning or sometimes many years before the onset of the disease. (32) Depression can occur in up to 27.6% of PD patients during early stages of the disease.(33) Depression may consist in major depressive disorder (17%), minor depressive disorder (22%), and dysthymia (13%), and clinical significant depressive symptoms are present in 35% of PD patients. (34, 35) Our results show that the item “sustained depression, lasting more than a week” was the most frequently observed in both genders. It was found in 90 patients (30.7%) in our study sample. Apathy consists in a loss of motivation, which appears in emotional, intellectual domains and in the behavior. For the diagnosis of apathy, the decrease of spontaneous acting must not be imputable to motor disability, nor to severe cognitive decline. (36, 37) Indeed, this neuropsychiatric symptom is frequent, with a prevalence of 30% to 40% in PD patients. (38, 39) Apathy is one of the major determinants of a reduced quality of life in PD, (40) even at early stages. As such, early diagnosis and efficient therapy are important in order to avoid further consequences on quality of life and disability. Lack of motivation and loss of initiative were most frequent.
among the PD patients. Those symptoms were with high prevalence in our study sample and was found in 245 patients (83.6%).

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The authors report no conflict of interest for this article.

LIST OF ABBREVIATIONS:
PD – Parkinson's disease
UPDRS - Unified Parkinson's disease Rating Scale
MMSE – MiniMental State Examination
MOCA - Montreal Cognitive Assessment Scale
MCI - Mild Cognitive Impairment
NMS – Non-motor symptoms

REFERENCES

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