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Original article

Factors associated with depression in Parkinson's disease: a cross-sectional study in a Polish population

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Abstract

Objective. – The aim of this study was to assess the prevalence and factors influencing depression in PD patients in a cross-sectional outpatient clinic - based Polish patients sample.

Materials and methods. – One hundred consecutive PD patients were included in this study; 35 of them fulfilled DSM-IV criteria for Major Depression and its severity was assessed with Montgomery–Asberg Depression Rating Scale (MADRS). A structured interview and a neurological examination, including Hoehn and Yahr scale (H–Y), Schwab–England disability scale, II, III, IV parts of Unified Parkinson's Disease Rating Scale (UPDRS), and Mini-Mental State Examination (MMSE) were performed. The parameters obtained were analysed between the depressed and non-depressed PD patients.

Results. – The prevalence of depression in PD in Polish population was established at the level of 35%. PD patients with depression scored significantly higher in all UPDRS scales (except for the subscale of clinical fluctuation) and in H–Y scale. PD with depression was also associated with longer PD duration, higher doses of L-dopa equivalents, patients' age, general impairment of daily living in Schwab and England disability scale, lower MMSE and higher clinical fluctuations. However, those six differences were insignificant.

Conclusions. – Depression prevalence rate among PD patients in Polish population is slightly lower than in most of other published studies. This may result from strict selection criteria, use of specific outcome measures and restricted criteria for depression that were applied.

Keywords: Parkinson's disease; Depression; Comorbidity

1. Introduction

Parkinson's disease (PD) is the second most common neurodegenerative disease next to Alzheimer's disease. It affects approximately 1% of patients aged 65 and above and its prevalence rises along with the aging of the general population [10]. Depression is among the most common non-motor features of PD along with cognitive impairment and autonomic dysfunction [9,24]. It occurs in approximately half of PD patients [10]. The prevalence of depression in PD patients remains controversial and the results of the studies on the prevalence of depression in PD patients' populations are inconsistent varying from 4% to 90% [2,8,25,31]. The research centres based surveys estimate the prevalence of depression in 40–50% of patients while the community-based studies estimate its prevalence to be less than 10%. The rates also vary between the countries [39]. Its prevalence may, however, be adjusted at 40% of all idiopathic PD patients [9] and it is higher in PD patients population when compared with the control groups [11].

The diagnosis of depression is complex. Its symptoms, such as bradykinesia, lack of concentration, weakness and sleep disturbances, are similar to the PD symptoms. The recognition of signs and symptoms of depression comorbid with PD is crucial for the clinical practice in view of the fact that it influences the functional disability and quality of life [34,36,40]. The epidemiological issues regarding the prevalence of depression in PD remain unclear and seem to vary upon the investigated population as it was summarised by Cummings in his classic review "Discrepancies in the reported frequencies reflect the use of

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different definitions of depression, thresholds for identification of a mood disorder, and assessment strategies" [9].

It is believed that depression in PD is more common in women and its morbidity is related to the early PD onset, physical disability and anxiety level. The highest depression prevalence rates are found in the early and late phases of PD [4,23]. The role of therapeutic application of L-dopa and dopaminergic receptors agonists in PD with depression is not clear. Theoretically L-dopa may promote depression (especially in individuals with history of depression) while on the other hand L-dopa acts as an antidepressant by improving motor abilities [26,30]. The other predictive factors for depression are akinesia, coexisting cognitive dysfunction and the parkinsonian symptoms predominant on the right side of the body [1].

The aim of this study was 1) to estimate the prevalence rates of depression in PD patients sample of Polish population 2) to establish the relationship between the depression and the neurological assessment scales scores as well as data concerning therapy and demography.

2. Materials and methods

2.1. Data collection

A consecutive series of 100 patients (52 men, 48 women) with clinically confirmed idiopathic PD were enrolled in the study. The patients were referred to regional movement disorders outpatients' clinic (the only one in the area) by neurologists and general practitioners from the area of Gdańsk province (the population of approximately 2,179,000 inhabitants at day) with PD to receive a second opinion regarding the diagnosis and/or treatment, as it is the standard procedure in Poland. Because the health care system in Poland is organized regionally and hierarchically, the population of general practice and neurology practice was representative of the surrounding area. All individuals underwent a complete neurological examination and a structured questionnaire interview. PD was diagnosed according to the Parkinson's Disease United Kingdom Brain Bank criteria [19]. To exclude patients with symptomatic parkinsonism, CT and/or MRI head examination were performed in all cases. After initial selection to exclude uncertain cases, all included patients agreed to participate in the study. One hundred patients were included due to sufficient requirements for statistical analysis. The examination was performed and all scales were obtained at the "on" phase and at the same meeting or exceptionally at the next meeting, when patients were able to co-operate.

The 35 patients diagnosed with depression fulfilled DSM-IV diagnostic criteria for major depressive episode [3]. Its severity was further rated with Montgomery and Asberg Depression Rating Scale (MADRS) [27]. The clinical assessment included the Hoehn and Yahr Scale (H–Y) [17], the Schwab and England Activities of Daily Living Scale (S–E) [35] and the Unified Parkinson's Disease Rating Scale (UPDRS) with three subscales: activities of daily living (ADL—UPDRS part II), motor examination (UPDRS part III), complications of therapy (UPDRS part IV). Clinical fluctuations were measured by UPDRS part IVB [13]. Instead of UPDRS part I, mental status was assessed using Mini-Mental State Examination (MMSE) [14]. The parameters obtained were analysed between the depressed and non-depressed PD patients.

Moreover, the structured interview was used to obtain information on disease history and socio-demographic situation of patients such as: gender, age, disease duration (years from diagnosis), predominant features of disease (tremor, rigidity, mixed), daily dose of L-dopa with benserazide, active rehabilitation, presence or absence of comorbidity, economic situation and costs of medications. The data were corroborated by referral source records obtained from the neurologists.

The study protocol was approved by the local bioethics committee at the Medical University of Gdańsk.

2.2. Statistical analysis

The statistical analysis was performed using Shapiro–Wilk W test, $\chi 2$ test and Mann–Whitney U test.

3. Results

3.1. Group characteristics

The mean age of the original examined sample ($n = 100$) was 66.0 ± 9.3 years. The average duration of PD was 6.7 (1.4–24) years. The mean H–Y stage of patients was 2.63 (1–5). Fifty-nine percent of patients suffered from mild or moderate disease (H–Y 1–2.5) and 41%—severe disease (H–Y 3–5). The mean total UPDRS score obtained at the "on" phase of examination was 37.4 ± 16.5. Clinical fluctuations were present in 37% of patients, 18% had dyskinesias, 84% had postural instability (including gait and postural abnormalities) and 33% experienced falls. MMSE revealed 81% of patients scoring higher than 23 pts. (no dementia), 14% scoring 19–23 pts. (mild dementia), 5% scoring 11–18 pts. (moderate dementia). In 11% of patients, symptoms were dominated by tremor, in 9% by rigidity and 80% had mixed symptoms. The mean daily dose of L-dopa with benserazide was 718.3 ± 314.9 mg. Concomitant diseases reported in the questionnaire were: heart disease—in 29%, hypertension—in 23%, diabetes mellitus - in 16%, digestive tract disease—in 4%, and respiratory disease—in 2% of patients. Eighty-three percent of patients were living with others, whereas 17% were living alone. The mean amount of money spent on antiparkinsonian therapies was 18.1 ± 17.4% of monthly incomes. Twenty-one percent of patients practiced regular guided exercise in a physiotherapy centre, 49% of patients performed exercises at home, but only 21% regularly.

Thirty-five percent of PD patients were diagnosed with depression and, of those, 26% suffered from moderate depressive episode and 9% suffered from severe depressive episode as it was rated with MADRS scale. Sleep problems were reported by 48% of all study patients and four patients experienced visual hallucinations.