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Clinical characteristics of Parkinson's disease patients in Greece: A multicenter, nation-wide, cross-sectional study

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ABSTRACT

Parkinson's disease is a neurodegenerative disease, with a constantly increasing prevalence and a high global financial impact arising from direct and indirect costs. Large-scale, observational studies provide data that support the better comprehension of disease aspects, constitute a baseline reference for future studies and assist comparisons among different patient populations, allowing the recognition of distinctive characteristics and special needs. The present study is the first to depict the clinical characteristics and their interplay in a large sample of Parkinson's disease (PD) patients in Greece. Nine hundred eighty six consecutive PD outpatients were recruited from 17 centers around Greece in the time period from 8/2007 to 7/2009 and were examined and interviewed by movement disorders experts. Multiple clinical characteristics were recorded including age at diagnosis, disease severity, patients' self classification of PD symptoms and their relevance to physician's global clinical impression, smoking, alcohol consumption, presence of family history for PD, dementia, depression, hypertension, cancer and other comorbidities. Associations of high clinical significance were found between certain clinical characteristics.

1. Introduction

Parkinson's disease (PD) is a neurodegenerative disease with its prevalence constantly increasing as the world population ages. Its worldwide prevalence varies from 18 to 418 per 100,000 inhabitants [1]. The incidence of the disease also varies and ranges from 4.9 to 26 per 100,000 inhabitants/year [1]. This widespread variation could be attributed to different populations, different methodology and diagnostic criteria of PD. According to a recent population-based study, the estimated standardized incidence of PD in Greece was found to be 16.9 per 100,000 person-years [2]. So far the clinical characteristics of patients suffering from PD in Greece have not been described at a nationwide level.

The aim of this large, cross-sectional, nation-wide, clinic-based study was to identify the demographic and clinical characteristics of a highly representative sample of the Greek PD patients and the current pattern of use of antiparkinsonian agents. In the present paper, we report the baseline epidemiological and clinical characteristics of this PD population and their associations and interplay, including the age at diagnosis, the presence and the severity of cardinal parkinsonian symptoms and the family history for PD. The patterns of habitual smoking and alcohol drinking were also investigated. Finally, the prevalence of concomitant diseases is presented along with its association with significant clinical factors. Large-scale, observational studies like this provide data that support the better comprehension of disease aspects and assist comparisons among different global patient populations, allowing the recognition of distinctive characteristics.

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2. Materials and methods

2.1. Recruiting centers and eligibility criteria

Seventeen outpatient units for movement disorders from all over Greece [*Supplementary material*] collaborated for the collection of data. The study was carried out from August of 2007 through July of 2009. The diagnosis of the disease was made by trained neurologists with a high level of experience in movement disorders, in accordance with the United Kingdom Brain Bank Criteria for idiopathic PD [3]. Genetic cases were not excluded. The doctors collected the following data on a sole, random, typical visit and examination of patients. All patients fulfilling the above criteria that were examined at each one of the seventeen outpatient units during the study period were included. The only exclusion criterion was the lack of consent. Informed consent was obtained from each participant. The study was approved by the National Ethics Committee and was conducted in accordance with the Declaration of Helsinki ethical guidelines.

2.2. Data collection

The severity of the disease was assessed by the examiner according to the modified Hoehn & Yahr staging scale [4]. The patients were requested to classify the severity of tremor, bradykinesia (described as slowness in movement) and gait disturbance using the following scale; 0 = absent, 1 = slight-not troublesome, 2 = moderate- somewhat troublesome, 3 = marked-troublesome enough, and 4 = severe-interferes with most activities. Moreover the examiners reported their global clinical impression on the disease severity classifying it as mild (patient physically independent, capable to perform his/her daily activities without requiring assistance, even if somewhat slow), moderate (patient not totally physically independent, requires some assistance to perform some daily activities) and severe (patient requiring considerable assistance in most of daily activities). We chose to collect this kind of information because it represents a complement to the patients' perception of disease severity, but also because it captures a global aspect of the burden of the disease.

Information on family history of PD among first- to third-degree relatives was obtained from the patients and/or accompanying family members through a direct interview. The exact family degree was recorded along with the number of affected family members. To avoid false positive recordings, in case of positive response further questions were asked including type of symptoms, intake of medication, responsiveness to treatment and presence of symptoms compatible with atypical parkinsonism.

Subjects were also encouraged to provide information on their smoking and drinking habits. Regarding smoking, they were characterized as current smokers, former smokers and never smokers. The alcohol consumption was categorized as heavy (>14 alcoholic beverages per week), frequent (5–14 alcoholic beverages per week), occasional (<5 alcoholic beverages per week) or none.

The participants were also asked to report any other serious concomitant disease in terms of receiving systematic treatment for. In order to increase the question sensitivity the patients were kindly requested to refer the whole list of medications received for any reason. If present, accompanying family members or caregivers were asked to confirm this information while medical documents if present were also screened. Evidence of existence of dementia and depression was obtained with the same method. Although this may have lead to under-reporting of these disorders a neuropsychological assessment lied beyond the scopes of the present study, which was designed to detect the prevalence of already diagnosed PD comorbidities. The patients were also questioned on a possible previous diagnosis of cancer and the precise type was identified by medical documents.

2.3. Statistical analysis

Patient characteristics were described using means and standard deviation or medians and interquartile ranges (IQR) for continuous variables, and percentages for categorical variables. Between-group comparisons were performed using a t-test or a chi-squared test, as appropriate. Ordinal regression analysis was implemented to identify potential associations of clinical assessments with patient age, gender, age at diagnosis and the disease duration and to investigate how the self-reported individual symptom components contributed to the examiner's global assessment of the disease severity.

In order to identify predictors for co-morbidities (hypertension, diabetes mellitus, dementia and depression), univariate and multivariate analyses were performed using logistic regression. Dependent variables entered into the models included age, gender, age at diagnosis, disease duration, disease severity and family history for PD. Multivariate models considered all variables with $p < 0.1$ on univariate models and used a backward elimination approach for final selection. There was no overt violation of the proportionality assumption.

All analyses were performed in SPSS and STATA. All p-values are 2-tailed.

3. Results

3.1. Basic characteristics of participants

A total of 986 consecutive outpatients with diagnosis of PD were included in the study. The mean age of the participants at the time of recruitment was 70.4 years [SD 9.8]. There was a male predominance in our population (57% male vs. 43% female). The mean age at the self-reported time of diagnosis was 63.9 years [SD 11.06], ranging from 35 to 95 years. The mean disease duration was 7 years (IQR 3–11 years). One hundred and twenty-three patients (13%) had PD with early onset, defined as diagnosis at 50 years of age or earlier. There were no statistically significant differences between men and women regarding the disease duration, the age at diagnosis or early onset.

3.2. Disease severity

According to the examiner's global clinical assessment, the severity of the disease was classified as mild in 52%, moderate in 36% and high in 12% of the patients. The patients' distribution according to Hoehn &Yahr staging scale is presented in Fig. 1 (median 2.5). There was a statistically significant association between the disease stage and the patient's age (OR = 1.1; 95% CIs 1.0–1.1), as well as with the disease duration (OR = 1.1; 95% CIs 1.0–1.1). The patients using the scale described previously classified the severity of tremor, bradykinesia and gait disturbance as presented in Table 1.

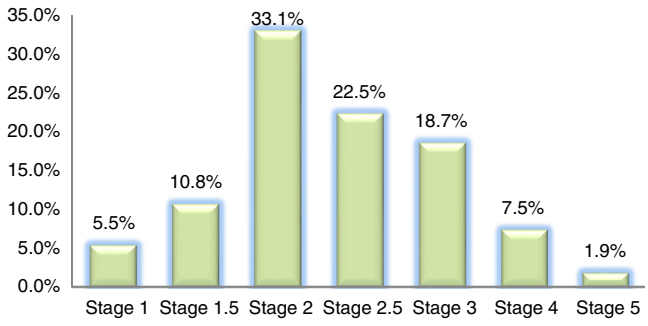

Fig. 1. Distribution of participants according to the severity of the disease (Hoehn & Yahr scale).