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Prevalence of functional (psychogenic) parkinsonism in two Swiss movement disorders clinics and review of the literature

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ABSTRACT

Background: Functional parkinsonism (FP) is considered rare but no studies have looked at its frequency. Case series have described high rates of comorbidity with Parkinson's disease (PD), suggesting a possible association between these conditions.
Objectives: To study the prevalence, epidemiology and clinical features of FP and its association with PD.
Methods: We conducted a cross-sectional population-based prevalence study as well as a chart review of cases who received a diagnosis of FP over a 10-year-period in two movement disorder clinics in Switzerland. Epidemiological data regarding FP features were collected. The co-occurrence of PD, psychiatric disorders and other functional disorders were recorded. Clinical differences between FP and FP + PD groups are presented and discussed in light of a literature review.
Results: The crude prevalence of FP was 0.64 per 100,000 in our population. FP represented 0.24% of patients with parkinsonism. Among 12 FP cases, female gender predominance (87%), mean age of onset of 45.5(± 13.3 Standard deviation SD) years and prolonged diagnostic delay (mean 59 ± 75 SD months) was found. Six patients had an additional diagnosis of PD, 83% of depression and 66% of other functional neurological disorder. In four patients with FP + PD, FP preceded PD by 6 to 56 months.
Conclusions: These results suggest that FP should be considered in the differential diagnosis of patients presenting with parkinsonism. The high rate of co-occurrence with PD emphasizes the importance of long-term follow up of these patients. The observation that FP often precedes PD should be verified in prospective studies.

1. Introduction

Functional (psychogenic) movement disorders encompass well characterized [1] clinical manifestations involving all types of abnormal movements, including parkinsonism [2]. Prevalence estimates of functional neurological disorders varies from 6 to 15% of patients presenting to neurological services [3] and represent the second commonest cause for a neurology consultation after headache [4]. Around half of them present with a functional movement disorder [5], 10% (range 1.7–25%) of which have been categorised as functional parkinsonism (FP) [6]. FP is defined by a combination of tremor, stiffness, slowness and gait disturbances, incongruent with a “traditional” neurologic disorder, displaying psychogenic/functional positive signs such as variability and distractibility [7]. No cross-sectional epidemiological studies of FP exist. Case series have reported high rates of comorbid FP and Parkinson's disease (PD) [8–10]. A series of 11 patients presenting both FP and PD suggests that common neurobiological mechanisms may be involved in these two disorders [8]. A cohort study [11] of 942 patients with neurodegenerative disorders found significantly higher frequency of somatoform disorders in PD (7%) and Dementia with Lewy Body (DLB) (12%) than in other neurodegenerative disorders (Alzheimer, Multiple System Atrophy, Progressive Supranuclear Palsy or Frontotemporal Dementia, 0–3%), leading the authors to question whether somatoform disorders should be considered to be part of the spectrum of a premotor feature of PD/DLB [12]. This work, however, included, nonspecific functional symptoms (i.e. "multifocal pain, gastrointestinal disturbance, abnormal postures") that may have been explained by the presence of Parkinson's disease itself.

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Our aim was to provide an estimate of the prevalence of FP by conducting a cross-sectional population-based prevalence study. Our second aim was to look at the co-occurrence rate of FP and PD and the third aim was to obtain epidemiological and descriptive clinical data on these subgroups.

2. Methods

2.1. Epidemiological study

2.1.1. Study design and population

We performed a descriptive cross-sectional population-based prevalence study. It was part of a larger study aiming to determine the prevalence of parkinsonism in Geneva Canton. The study was approved by the Swiss Ethics Committee (protocol 13-019).

The study period was 10 years (1.01.2003 to 31.12.2012). All residents of Geneva Canton during this period were eligible for inclusion. The Geneva Canton has a single public hospital (HUG), which receives referrals from a group of interconnected hospitals and offers the only public access for the whole population of the Canton. It includes the only tertiary referral centre for neurology and has a specialized Movement Disorders Clinic.

2.1.2. Inclusion criteria

Cases were defined as prevalent if: 1) they fulfilled the Fahn and Williams classification for *clinically established or probable* functional movement disorder [13] and were described as functional/psychogenic parkinsonism, 2) they lived in the Geneva Canton and 3) were alive on 1.01.2013. Alive-dead status on 1.01.2013 was determined through official records (http://ge.ch/population/avis-de-deces).

2.1.3. Case finding

Cases were identified through clinical records of patients followed in the Movement Disorders Clinic of the tertiary referral centre (HUG) and patients who had a DaTscan performed in HUG. We identified all patients with the terms “psychogenic”, “functional”, “unexplained”, “conversion”, “somatoform”, “somatization”, “anxiety-related” and “depression-related”. The medical records were reviewed by one of the authors (GFP) who had not been previously in charge of these patients. In doubtful cases, records were analysed again and a consensus agreement was reached between two authors (GFP + SA).

2.1.4. Statistics

The crude prevalence rate (point prevalence) was defined as the number of individuals alive and exhibiting FP on the prevalence day per 100,000 of the general population. Census data of the general population from 2012 were obtained from the Cantonal Statistical Office (http://www.ge.ch/statistique/).

2.2. Clinical (descriptive) study

2.2.1. Case finding

We extended our case finding search to the Movement Disorders Clinic of the tertiary referral centre (CHUV) in the adjacent Vaud Canton. A retrospective chart search using the same terms was performed. Subjects were included if sufficient information was available in their charts to ensure the diagnosis of FP fulfilled the Fahn and Williams classification for *clinically established*, or *probable* or functional movement disorder [13]. The medical records were reviewed by two authors (GFP + SA), as described above. Clinical data from the cases in the Vaud Canton was combined with data from Geneva Canton. However, cases from Vaud were not included in our prevalence study.

2.2.2. Data collection

For each included subject, the following *demographic data* were extracted: gender and age at onset of clinical symptoms. The following *clinical data* were extracted: type of presenting symptoms, initial diagnosis by a neurologist, type and side of functional parkinsonism, positive signs such as tremor (variability, distractibility, entrainment), hypertonia (Gegenhalten-type hypertonia, fluctuating hypertonia), slowness (hypokinesia without decrement of amplitude over repeated movements) and gait characteristics. Type and side of classical PD signs were recorded (resting tremor, cogwheel rigidity, bradykinesia with decrement in amplitude). Medications (antiparkinsonian and psychotropic drugs) taken during the course of the disorder were recorded. Antiparkinsonian drugs were classified as effective, partially effective or ineffective, according to available clinical notes. Motor UPDRS III scores, levodopa test response, brain MRI, Fluorodopa PET or DaTScan results were recorded, when available.

The following *comorbidities* were systematically looked for: Parkinson's disease according to the clinical criteria of the UK Brain Bank, depression or anxiety diagnosis when present in the case record, other neurological functional disorder diagnosis according to DSM-5 criteria [14].

2.2.3. Data analysis

Descriptive qualitative analysis was performed. Means and standard deviation were calculated for both the whole sample for age and time values, as well as the subgroups of patients with only FP and those with both FP + PD and compared with Student *t*-tests.

3. Results

3.1. Epidemiological study

During the 10-year period, a total of 2312 patients with parkinsonism were identified. 1077 patients were excluded because of death, misdiagnosis, or they had moved out of the Canton at the prevalence date. Among the remaining 1235 patients, 9 cases with suspected FP were identified. After chart review, only 3 fulfilled Fahn and Williams diagnosis criteria.

According to the 2012 census, the Canton of Geneva population was 470,512 inhabitants. The crude prevalence rate of FP was 0.64 per 100,000; representing 0.24% of patients with parkinsonism and 1.3% of non-degenerative parkinsonism (drug-induced parkinsonism (44%) and vascular parkinsonism (37%) being the most frequent).

3.2. Clinical (descriptive) study

In the Vaud Canton (1.2 million inhabitants) 15 charts were suspected of FP but only 9 had sufficient information to fulfil Fahn and Williams criteria. Overall, 3 FP cases from Geneva and 9 FP cases from Vaud were included.

3.2.1. Demographic and clinical data

Eight FP were female (67%) and 4 male (33%) (Table 1). Mean age at onset was 45.5 ± 13.3 (SD) years. Mean time from onset to FP diagnosis was 59 ± 75 months. Mean follow-up period was 28 ± 24 months. The main presenting symptom was tremor (6 patients, 50%), gait impairment (3 patients, 25%), slowness of movements (1 patient, 8%), hemibody stiffness (2 patient, 16%). The initial diagnosis from the first neurological visit (outside tertiary centres) was FP in 3 patients only (25%); it was PD in 6, Restless Legs Syndrome (RLS) in 1, Multiple System Atrophy (MSA) in 1 and Chronic Pain Syndrome in 1. The functional FD signs were as follows:

3.2.1.1. Tremor. Nine patients had a resting tremor, 8 of them with additional positive signs for functional tremor: variability (in amplitude and/or frequency and/or direction) [6], distractibility [5], entrainment [2].

3.2.1.2. Slowness. Five patients had bradykinesia: 2 of them with

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