Research Article

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Characteristics of Frontal Dysfunction in the Earlier Phases of Parkinson's Disease.

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ABSTRACT

Introduction : Parkinson's disease (PD) was first identified by James Parkinson as a motor condition; however, research has shown that the cognitive impairments associated with the disease, such as disejecutive syndrome, frequently get worse over time.
Objective : to assess frontal dysfunction (FD) in Parkinson's disease (PD) patients to identify early risk factors for frontal dysfunction.
METHOD : We conducted surveys with demographic, clinical, and neuropsychological data from 125 patients diagnosed with idiopathic Parkinson's disease (PD) and Hoehn and Yahr Stages less than two. The Frontal Assessment Battery (FAB) was one of the investigations conducted on these patients.
RESULTS : The diestrums that dominated and those that started with tremor were 68.1±8.6, with an onset age of 62.6±10.5. With an average FAB of 11.82±3.7, FD was found in 71.4% of the 125 cases. An inversely proportionate connection was seen between the age (R=-0.45; p<0.001) and the onset age (R=-0.33; p=0.02).

INTRODUCTION

James Parkinson published a 66-page monograph in 1817 that contained the first description of Parkinson disease (PD). A Discourse on the Trembling Palsy [1]. After Alzheimer's disease, PD is still regarded as the second degenerative condition affecting the central nervous system [2-4]. Despite being first identified as a motor issue, it has been shown that Parkinson's disease (PD) frequently causes cognitive difficulties in the form of executive syndrome, which get worse over time [5–13]. Due to their visuospatial and visuoperceptual impairments, the patients struggle to maintain adaptive responses, which affects their attentional and work memory [14]. It has been shown that subcortical pattern dementias, whose prototype can be Parkinson's disease, exhibit many of the symptoms of frontal illness [15–20]. Our goals in writing this research were to define frontal dysfunction in PD patients and identify the variables associated with frontal dysfunction in the early phases of the disease.

METHODS

A descriptive cross-sectional study was carried out on Parkinson's disease (PD) patients who visited the University Hospital Dr. Gustavo Aldereguía Lima for a consultation. Within a year for the same, all patients with Parkinson disease in the early stages (Hohen and Yahr Stages ≤2) were included; a total of 125 patients met the following requirements: PD patients diagnosed in stages I and II of Hohen and Yahr, excluding: patients with secondary or atypical parkinsonism; patients suffering from severe depression or delirium; patients whose cognitive decline is so severe that it is not feasible to perform a neuropsychological study [21].

Methodology

The study was conducted in two stages.
Phase I (clinical data collection phase): In this stage, a structured interview incorporating clinical, sociodemographic, and risk factors for frontal dysfunction will be conducted. Age, sex, race, and other demographic information will be gathered, and the Hoehn and Yahr scale and the UPDRS motor scale will be used to assess the disease's stage.
Phase II (the neuropsychological study phase): In this stage, the 125 patients were worked with, and the sample was then used to classify the patients according to Hoehn and Yahr stages to those who underwent a battery of neuropsychological tests, including the Mini Mental State Test (MMSE), the Montreal Cognitive Assessment (MoCA), the Hamilton depression scale, and the Ysavage depression scale for patients older than 60. Additionally, the Frontal Assessment Battery (FAB) was employed to assess frontal dysfunction.

Battery of Frontal Assessment (FAB)

The six subtests are similarities (concept formation), verbal fluidity (mental flexibility), motor series (programming), interference (realization of conflicting instructions), control (inhibition of responses), and autonomy (independence of the external environment), as indicated by Dubois et al. [22]. This

allows for an exploration of the characteristic functions of the frontal lobes. The maximum score for each subtest is 18 points because each subtest is worth 0 to 3 points. In order to categorize frontal dysfunction, we use: The score for frontal dysfunction was less than 15 points. We identify 16–15 as the cutoff points for frontosubcortical impairment and 14–12 as the cutoff points for frontosubcortical dementia [23].

Cognitive deterioration

Ultimately, the Diagnostic and Statistical Manual of Mental Disorders (DMS-IV) criteria were used to determine each patient's diagnosis. The degree of the decline will be assessed using the Parkinson Dementia (PD) criteria, which classify mild cognitive decline as occurring in patients with MMSE and MoCA scores between 23 and 26 points. Patients with scores below these thresholds were classified as dementia carriers [13].

Statistical analysis

The statistical software for Windows, SPSS v15.0, was used to process the data. One $p<0.05$ was regarded as statistically significant. The Student's t test was used to evaluate the average values of the clinical (UPDRS scale, primary symptom, clinical onset), age, onset age, time of evolution, and schooling, and clinical variables related to the patients' frontal dysfunction. Additionally, a correlation between the FAB values and the clinical and demographic data was conducted using Pearson's correlation coefficient, with the significance of the connection increasing as the values of R approach unity.

Because of this, we will adhere to the ethical guidelines for doing research on humans when designing this study [12,13].

RESULTS

The onset age of 62.6±10.5 years and the current age of 68.1±8.6 years, correspond to the global average for the sixth decade of life and indicate the beginning of tremoric form. In addition, the time of evolution mean was 5.6±4.3 years, despite the patient being in the early motor stages of the disease progression, with a mean of the motor UPDRS in On and Off that does not reach the 20 points.

One of the main factors associated with frontal dysfunction is age, which can be used to determine whether cognitive changes occur as one gets older. The average age of the participants in our study was 68.1 years. It is interesting to note that the motor scales of Parkinson's disease (PD) did not demonstrate a statistically significant relationship with the neuropsychological scales, which indicate the presence of global cognitive alteration. This is evidenced by the association between frontal dysfunction and the Mini-Mental Assessment (MCA) and Mini-Mental Scales (MMSE). This means that during the early stages of the EP, not only are parietal areas and ascending subcortical systems affected. besides the putamen, caudate, or nucleus accumbens, which is linked to the implicit learning of habits or of incentive response and sensoriomotor coordination, most appropriate planning of each incentive, that they use other neurotransmitters [25, 26]. In addition, there is a unique abnormality that develops in the motor circuits that cause classical acinesia or bradycinesia: the dorsolateral frontal circuit that, when combined with the previous cingular circuit, results in a disejecutive syndrome with difficulties in mental flexibility and criteria change, planning and strategy generation, action organization, experience utilization, and spontaneous activity production. Additional symptoms of this syndrome include reduced initiative and attentional maintenance.

CONCULSION

As this study shows, degradation already occurs in the early stages of Parkinson's disease (PD) in various frontal cortical regions, including the motor cortex, premotor, dorsolateral, and cingular area. Among the factors associated with frontal dysfunction are age and beginning age over 60, less education than a second level of teaching, and the existence of generalized cognitive affectation.

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