

IMPACT OF A MOVEMENT DISORDERS CLINIC ON THE TRENDS OF PARKINSON'S DISEASE CONSULTATIONS AT A TERTIARY REFERRAL CENTER

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ABSTRACT

Background: Outpatient clinics for movement disorders provide specialized diagnosis and treatment services for the specific needs of this patient population. **Objective:** Describe the impact of implementing a Movement Disorder Clinic on the trends of consultations per year and hospitalizations of subjects with Parkinson's disease at a tertiary referral center. **Methods:** A retrospective study was carried out. We collected data from the Clinical File Archive and the Epidemiology Department at the National Institute of Neurology and Neurosurgery in Mexico. Data from January 1, 1999 through December 31, 2015 were included for analysis. **Results:** The number of total consultations had an increase of 632.1% between 1999 and 2015. Follow-up visits represented up to 95% of the consultations. Peaks found correlated with the inclusion of new specialists in the clinic. Regarding hospitalization, the number of patients discharged with a diagnosis of Parkinson's disease increased from a median of 17 (range 9-35) to 46 patients (range 31-53) per year. **Conclusions:** The implementation of a multidisciplinary Movement Disorders Outpatient Clinic in a tertiary referral center had a direct impact on the total number of consultations per year, mainly follow-up visits. The latter may reflect in an improvement in the quality of care. (REV INVES CLIN. 2016;68:176-80)

Key words: Movement disorders. Outpatient clinic. Parkinson's disease.

INTRODUCTION

The main objective of a specialized outpatient clinic is to provide patients with expedited access to diagnosis, treatment and, when needed, fast reference to other specialists. The implementation of a specialized clinic should optimize the time and quality of care.

Outpatient clinics for movement disorders began to develop in the early 1990s¹ and had their peak during the 2000s.

The role of a movement disorder clinic has been highlighted as a consequence of the need for a multidisciplinary approach. In addition to neurologists with

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expertise in the field, a movement disorder clinic requires other specialists and health-related professionals such as speech therapists, physical rehabilitation therapists, nursing specialists, neuropsychologists, and neuropsychiatrists. It has also been suggested that the inclusion of a pharmacist in the clinic's team is of great value². Moreover, specific activities such as clinical and motor video recording are usually required³.

It has been reported that quality of life of subjects with Parkinson's disease (PD) improves in up to 30% when attention is given in a movement disorder clinic in comparison to a general outpatient clinic⁴. Another study proved that, in addition to the symptomatic benefit, subjects with PD reduced health-related indirect costs after being referred to a movement disorder clinic⁵.

Since 2009, the US National Parkinson Foundation has had a certification program of Centers of Excellence for the specific case of PD. This certification requires that the movement disorder clinic meets the following criteria:

- Sufficient volume of patients to ensure exposure to various manifestations of the disease as well as a wide range of therapeutic options;
- Provides care based on a model of a multidisciplinary team;
- Has a team of neurologists with formal training in movement disorders that balance clinical practice with academic and research activities;
- A spectrum of therapeutic options, including an experienced team of neurosurgeons;
- Demonstrates commitment to education and clinical training;
- Promotes and encourages programs of physical activity and nutrition;
- Provides current information to families and caregivers;
- Participates in the development of new knowledge through collaborative research and own research;

- Provides access to experimental therapies through the conduct of clinical trials.

To date there are 31 certified centers in the USA, one in Australia, eight in Canada, one in Germany, one in Israel, one in the Netherlands, one in Singapore, one in Taiwan, and two in the UK. There is no certified center in Latin America, although recently a center in the Bahamas has been certified. In general, the time from the implementation of an movement disorder clinic until its certification is estimated to be 10 years.

The objective of this brief communication is to describe the impact of implementing an movement disorder clinic on the number of consultations of subjects with PD per year given at the outpatient clinic, as well as on the number of hospitalizations, at the National Institute of Neurology and Neurosurgery.

MATERIALS AND METHODS

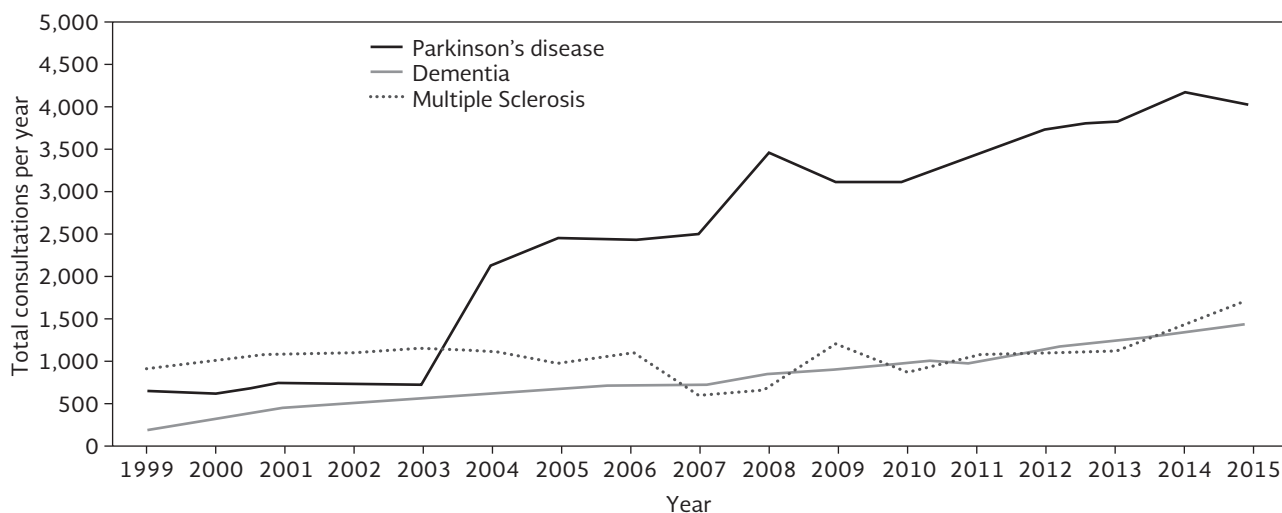
We collected data from the Clinical File Archive and the Epidemiology Department of the National Institute of Neurology and Neurosurgery of Mexico from January 1, 1999 through December 31, 2015. Data included the total number of first-time consultations (new cases), total number of follow-up consultations, and total number of hospitalizations due to PD. For this study, subjects with PD were identified using the International Statistical Classification of Diseases and Related Health Problems 10th Revision (ICD-10) code G20. In addition, data from two other specialized clinics were extracted for comparison. Data for dementia consultations (ICD-10 code G30) at the Cognition Clinic and data for multiple sclerosis consultations (ICD-10 code G35) at the Multiple Sclerosis Clinic were obtained using the same methodology.

A waiver of informed consent was approved by the Ethics Committee due to the retrospective nature of the study and the fact that no identifying information was used. The study was approved by the Institutional Review Board.

Statistical analysis

Descriptive statistics was carried out using measures of central tendency and dispersion. Demographic and other qualitative data were expressed in terms of

Figure 1. Number of Parkinson's disease, dementia, and multiple sclerosis first and follow-up consultations per year for the period 1999 to 2015.



means and standard deviations. When data did not fit normal distribution, median and ranges were used. Qualitative data were expressed in terms of frequencies and percentages.

RESULTS

Between 1999 and 2015 a total of 41,926 consultations were given at the Movement Disorder Outpatient Clinic. Specifically, PD (G20) was among the first 10 causes of consultation at the National Institute of Neurology and Neurosurgery in all years, usually being the third or fourth overall cause of first-time consultation at the outpatient clinic. In 2014 PD was the third cause of consultation, and in 2015 it was the second overall cause of consultation at the outpatient clinic of the Institute.

The total number of consultations increased by 632.1% between 1999 and 2015. Figure 1 shows the total number of consultations given at the Movement Disorders Clinic, Cognition Clinic, and Multiple Sclerosis Clinic per year. Regarding PD consultations, two major peaks can be identified, the first one in 2004 and the second one in 2008. When analyzing only the first-time visits, a total of 85 first-time consultations were given in 1999 compared to a total of 225 in 2015. To be highlighted is the fact that first-time consultations showed a sudden drop from 2003 to

2004 in relation to follow-up visits (23.8-6.4 vs. 76.2-93.6%). The first-time visits in the following years ranged between 4.0 and 6.6%.

In comparison, a total of 199 consultations were given at the Cognition Clinic in 1999, increasing to 1,470 in 2015. Similarly, multiple sclerosis consultations at the outpatient clinic increased from 925 to 1,717 in the same timeframe.

Regarding hospitalization, the number of patients discharged with a diagnosis of PD has also increased in the last six years. During the period between 2001 and 2008 the median of patients hospitalized per year with a diagnosis of a PD was 17 (range 9-35), while between 2009 and 2015 the median increased to 46 patients (range 31-53) per year. The main reasons for hospitalization were diagnostic work-up, acute levodopa challenge, or undergoing deep brain stimulation (DBS) surgery. In regards to DBS surgery, the number of procedures ranged between 10 and 15 per year from 2008 to date. Detailed information on the number of consultations is shown in table 1.

DISCUSSION

The Movement Disorders Outpatient Clinic of the National Institute of Neurology and Neurosurgery in Mexico City was established in 1999, but it was not

Table 1. Frequency of Parkinson's disease consultations from 1999 to 2015 including first-time consultations, follow-up consultations, and hospitalizations

Year	Total consultations	Yearly percentage change	First-time consultations	Follow-up consultations	Overall cause of consultation	Number of hospitalizations
1999	634	–	85 (13.4%)	549 (86.6%)	3rd	NA
2000	626	–1.3%	132 (21.0%)	494 (79.0%)	5th	NA
2001	745	+19.0%	152 (20.4%)	593 (79.6%)	5th	17
2002	734	–1.5%	142 (19.3%)	592 (80.7%)	5th	16
2003	743	+1.2%	177 (23.8%)	566 (76.2%)	4th	35
2004*	2,137	+187.0%	137 (6.4%)	2,000 (93.6%)	4th	9
2005	2,461	+15.2%	162 (6.6%)	2,299 (93.4%)	4th	17
2006	2,448	–0.5%	137 (5.6%)	2,311 (94.4%)	4th	24
2007	2,501	+1.6%	140 (5.6%)	2,361 (94.4%)	5th	27
2008†	3,484	+39.3%	134 (3.8%)	3,350 (96.2%)	4th	15
2009	3,109	–10.8%	206 (6.6%)	2,903 (93.4%)	4th	46
2010	3,136	+0.9%	163 (5.2%)	2,973 (94.8%)	4th	53
2011	3,430	+9.4%	146 (4.3%)	3,284 (95.7%)	5th	52
2012	3,736	+8.9%	148 (4.0%)	3,588 (96.0%)	5th	50
2013‡	3,823	+2.3%	180 (4.7%)	3,643 (95.3%)	4th	31
2014	4,171	+9.1%	184 (4.4%)	3,987 (95.6%)	3rd	41
2015	4,008	–3.9%	225 (5.6%)	3,783 (94.4%)	2nd	43

*First movement disorder specialist in hospital staff. †First movement disorder specialist in hospital staff. ‡Third movement disorder specialist in hospital staff. NA: Not available.

until 2004 that the first movement disorder specialist was included. The Movement Disorders Clinic is currently based on a model of a multidisciplinary team, which includes board-certified neurologists with formal training who work closely with functional neurosurgeons, neuropsychiatrists, neuropsychologists, physical therapists, language therapists, and geneticists. In addition, the clinic works closely with specific family and patient support groups within the institute, as well as with external groups such as the Mexican Association of Patients with Parkinson. The Institute is currently the only hospital with a movement disorder teaching program (High Specialty Course in Parkinson's Disease and Movement Disorders) recognized by the National Autonomous University of Mexico. This one-year fellowship has also been recognized by the Pan American Section of the International Parkinson and Movement Disorder Society (<http://www.movementdisorders.org/MDS/Regional-Sections/Pan-American-Section/PAS-Fellowship-Programs/Mexico.htm>). Both, investigator-initiated research and protocols sponsored by the pharmaceutical industry are regularly carried out.

Nevertheless, according to the National Parkinson Foundation, the first requirement for achieving excellence

is a sufficient volume of patients to ensure exposure to various manifestations of the disease, as well as a wide range of therapeutic options. In this matter, our Movement Disorder Clinic provided approximately 4,000 consultations in the last three years. Most of these consultations were follow-up visits that allow for improved care of the patient with PD. Interestingly, the ratio of first-time/follow-up visits has remained steady for the last 10 years, resulting in almost 95% of the consultations being follow-up visits and only around 5% being first-time cases. This may be interpreted as a reflection of the referral rate to a tertiary center in Mexico.

The Movement Disorders Clinic at our Institute properly began in 1999, but it was not until 2004 that the first movement disorder specialist was included. The number of consultations had a threefold increase from 2003 to 2004. The second movement disorder specialist was hired in 2008, and an additional 40% increase on the number of consultations was seen. It should be pointed out that a third movement disorder specialist was included on the staff in 2013 with a lesser impact on the number of consultations, probably as a consequence of appointment scheduling constraints.

In comparison, data from the Cognition Clinic shows a slower but steady increase on the number of consultations. This can be partially explained by the fact that this clinic has currently only one specialist; in addition, the lack of a highly effective treatment may also result in a higher risk of loss at follow-up⁶.

Conversely, the number of consultations in the Multiple Sclerosis Clinic appears to be less predictable. It should be noted that this clinic was established almost at the same time and has the same number of specialists as the Movement Disorders Clinic. In this case, the development of effective disease-modifying therapies may have had an impact on the number of required consultations per year. Finally, patients who experience a relapse attend the emergency department rather than the outpatient clinic⁷.

On the other hand, the increase in the number of subjects with PD who are hospitalized again is associated with the inclusion of specialized neurologists, but also with an increasing number of DBS surgeries performed at the Institute. A complete and reliable registry of patients who underwent DBS surgery has been available since 2008 when the Local Committee for Movement Disorder Surgery was established. This committee evaluates the appropriateness of candidates for DBS based also in a multidisciplinary approach.

This study has limitations. First, demographic data are limited. Data such as age, gender, and disease duration will be of great interest, but are currently unavailable. Second, since the data were extracted from an existing database, the possibility of misdiagnosis cannot be properly assessed. Nevertheless, the misdiagnosis rate is expected to be low as a consequence of it being a specialist clinic. Third, our study is subject to a referral bias. Data from a tertiary healthcare center with a specialized Movement Disorders Clinic, as such,

may not reflect the same population trends seen in most primary contact centers or by the general practitioner. For example, essential tremor is considered the most common adult movement disorder worldwide⁸, but at our Movement Disorders Clinic, the main cause of consultation is PD.

In conclusion, the implementation of a Movement Disorders Clinic with a multidisciplinary approach has had a direct impact on the number of consultations per year, mainly follow-up visits, in a tertiary referral center. Further studies assessing the effect of this specialized clinic on patient-centered outcomes, such as health-related quality of life, are still needed.

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