Neuropsychological assessment of monolingual Spanish speaking Parkinson's disease patients in the United States pre and post STN-DBS

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INTRODUCTION

Research has consistently documented the significant influence of age, education, language, and acculturation on neuropsychological test performance. This is of significant relevance given that the Hispanic and Spanish-speaking population, which constitutes the largest U.S. ethnic minority, varies considerably in these characteristics from the English-speaking culture on which the majority of neuropsychological normative data is derived.[1] Having exhibited a growth rate in recent years approximately four times that of the nation's total population, the U.S. Census Bureau has predicted that the Hispanic and Spanish-speaking community will constitute nearly 25% of the U.S. population by the year 2050. Thus, identification of appropriate instruments and accompanying normative data for assessing members of this growing population is warranted.

A consensus is underway regarding the cognitive changes post subthalamic nucleus deep brain stimulation (STN-DBS) in the English speaking community of the United States, with declines reported in verbal fluency, verbal memory, and visuo-spatial skills.[2] However, a significant discrepancy exists in the STN-DBS outcome research of monolingual Spanish-speaking PD patients in the US. As such, the objectives of the current study were to (1) discuss the significant health disparity in the field of neuropsychology with this population, (2) present neuropsychological outcomes pre and post bilateral STN-DBS for monolingual Spanish speaking patients diagnosed with Parkinson's disease (PD), and (3) present Spanish neuropsychological measures which can be utilized with primarily SS older adults diagnosed with PD.

METHODS

Utilizing a comprehensive Spanish neuropsychological battery *(see Table 1)*, neurocognitive functioning prior to STN-DBS was examined in 14 monolingual Spanish-speaking PD patients recruited from the Parkinson's Disease and Movement Disorders Clinic at Baylor College of Medicine. Our sample was comprised of 8 males and 6 females of Hispanic descent. All participants were right-handed, with an average age of 55 years, 13 years of education, and 10 years duration of PD at baseline. Prior to surgery, 29% reported a mild history of depression, 35% experienced hallucinations and 14% reported delusions.

Of the 14 original participants, one female opted out of surgery due to pregnancy, 2 died, 3 were lost to follow-up, and 5 patients have yet to return. Our post-operative outcome study is ongoing, and thus far three patients have undergone post-surgical neuropsychological and neurological evaluations, which are presented.

- Patient #1 was 64 y/o with 9 years of education, a 12 year duration of PD, with current hallucinations, and taking anti-anxiety and antipsychotic medications at the time of presentation.
- Patient #2 was 45 y/o with 16 years of education, an 8 year duration of PD, with current delusions, and taking antidepressant and antipsychotic medications at the time of presentation.
- Patient #3 was 76 y/o with 12 years of education, a 10 year duration of PD, with current hallucinations, and taking only anti-anxiety medications at the time of presentation.

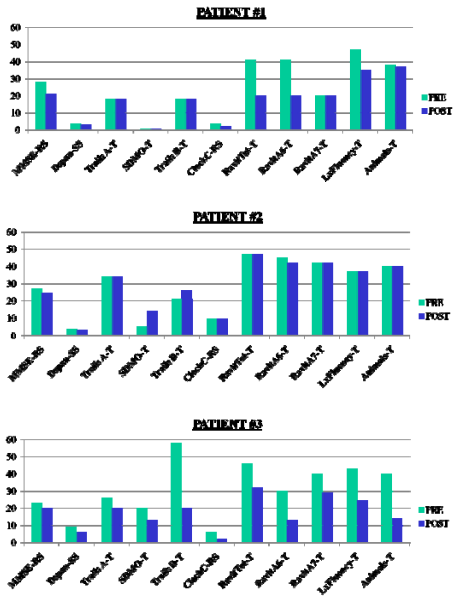
TABLE 1. Spanish measures listed by cognitive domain.

Domain	Measure
General Ability	Mini Mental State Examination
Verbal Memory	Rey Auditory Verbal Learning Test
Information Processing	Symbol Digit Modality Trail Making Test, Part A Digit Span (EIWA-III)
Language	Lexical Fluency Semantic Fluency
Executive Functioning	Trail Making Test, Part B
Visuo-spatial Skills	Clock Command

*In addition to these measures, the Spanish translation of the Dementia Rating Scale, 2nd edition was administered to patients # 1 and #3. This measure can be accessed through Psychological Assessment Resources. The authors will be publishing normative data in the upcoming months.

RESULTS

Motor improvement was found for those tested approximately 18 months post STN-DBS. In addition, the subset of patients presented were able to reduce their medication dosage following surgery. Post-operative neuropsychological evaluation revealed general declines in verbal fluency and verbal memory. However, a declivity in visuo-spatial skills was only observed in patients #1 and #3, while patient #2 demonstrated no change in visuo-spatial functioning.



According to a 95% RCI criterion,[2] significant declines were observed in general ability (MMSE) and auditory attention (Digit Span) in all three patients. While patients #1 and #3 showed further impairment in the other domains test post-surgery, patient #2 demonstrated no change in more than half of the measures administered, and actually improved his scores on one measure of oral information processing (SDMO), and executive functioning (Trails B). Patients #1 and #3 were older and also experiencing medication induced hallucinations at the time of surgery. However, both the patients and their families opted for STN-DBS due to the patient's poor quality of life given their severe PD symptoms including increasing dyskinesia.

CONCLUSIONS

❖Monolingual Spanish speaking candidates for STN-DBS should be evaluated using Spanish neuropsychological measures.

❖Some of these measures are currently available, while others are being validated and normed for this population *(See Table 1).*

❖ Patients and their families should be counseled regarding the possible cognitive changes associated with STN-DBS for the treatment of PD.

1.Acevedo, A., Loewenstein, D.A., Agron, J., & Duara, R. (2007) Influence of socio-demographic variables on neuropsychological test performance in Spanish-speaking older adults. *Journal of Clinical and Experimental Neuropsychology, 29,* 530-544.

2. York, M.K., Dulay, M., Macias, A., Levin, H.S., Grossman, R., Simpson, R., & Jankovic, J. (2008) Cognitive declines following bilateral subthalamic nucleus deep brain stimulation for the treatment of Parkinson's disease. *Journal of Neurology, Neurosurgery, & Psychiatry, 79,* 789-795.

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