Performance of Spanish-speaking community-dwelling elders in the United States on the Uniform Data Set

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Abstract

Background: Spanish is the second-most common language spoken in the United States, and Spanish speakers represent one third of the aging population. The National Alzheimer's Coordinating Center's Uniform Data Set implemented a Spanish neuropsychological battery. Previous work described the neuropsychological performance for English speakers. Here we describe performance on the Spanish version.

Methods: Data from 276 Spanish speakers with normal cognition were summarized, with descriptive tables of performance on individual cognitive tests. Regression techniques were used to evaluate the effect of demographics on cognitive performance.

Results: Spanish speakers were younger (70.0 vs 74.0 years) and less educated (10.7 vs 15.7 years) with more females (76% vs 63% female) than the previously described English speakers. Higher education and lower age were associated with better performance.

Conclusion: This national cohort of well-characterized Spanish-speaking elders provides descriptive data on cognitive performance, an important tool for clinical and research efforts.

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1. Introduction

The Hispanic population in the United States, most of who are primarily Spanish speakers, is one of the nation's fastest growing and largest ethnic minority groups. Spanish is the second-most common language spoken in the United States, with a prevalence of 12% of the total population and approximately one third of the aging population [1]. Spanish is the primary language spoken at home for more than 37.5 million people, of who almost half are limited in their English proficiency [2]. These individuals are at least as likely to experience cognitive loss and dementia as the broader population. Some have reported higher rates of dementia in the Hispanic population [3,4]. This poses a particular challenge because the assessment of cognitive deficits requires normative data against which to compare performance, and there are little available, particularly for the aging Spanish-speaking population. The recruitment of cognitively healthy Spanish speakers to the Alzheimer Disease Centers (ADCs) around the United States provides an opportunity to collect important data against which to compare performance of those with cognitive complaints. These centers contribute data to the National Alzheimer's Coordinating Center (NACC) using the instruments in the Uniform Data Set (UDS), which consists of a standardized clinical and neuropsychological assessment [5].

The UDS was selected by a clinical task force convened by the National Institute of Aging. The purpose of the UDS neuropsychological battery is to assess the continuum of aging in cognitively normal controls, from mild cognitive impairment (MCI) to early stages of Alzheimer's disease (AD) [5], and consists of brief measures of attention, processing speed, executive function, episodic memory, and

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language [5]. The value of neuropsychological testing for diagnosis of dementia in the elderly has been well established. The UDS neuropsychological battery was implemented in 2005 at all ADCs throughout the United States, and NACC reports data on approximately 25,556 cases, primarily of English speakers [6]. The neuropsychological assessment, collected from cognitively normal English speakers, has been described [7]. In 2007 the Spanish translation of the UDS was implemented [8] to those with cognitive impairment and to normal controls. This report presents the first description of the UDS performance on a Spanish-speaking normal cohort.

2. Methods

2.1. Data source and recruitment

This sample is selected from data submitted to NACC between 2007 and 2012, with a data extraction date of March 2012. Data included UDS clinical and demographic outcomes as assessed by ADC clinicians and research. Diagnosis was recorded on the UDS form D1 "Clinician Diagnosis—Cognitive Status and Dementia," which was completed by a single clinician or by a consensus diagnosis at each side [5,7].

Data came from 17 ADC sites with bilingual staff and Spanish-speaking elders in their cohort. Staff were expected to follow a structured protocol for administration and were supervised by senior investigators at each site who provided training as needed. Informed consent was obtained in accordance with local institutional review board standards. According to referral information within the UDS database, participants were from a community based convenience sample, recruited by media solicitation or were referred by a clinician, family member or friend. [7].

2.2. Selection of sample

The sample selection met the following criteria: neuropsychological battery administered in Spanish, clinical diagnosis of normal cognition, and a Clinical Dementia Rating (CDR) of 0 [9,10]. All data were collected from the initial baseline visit. Although each site establishes their own entry criteria, "normal controls" from the UDS data are generally free of major psychiatric illness and variables that are known to affect cognition, such as neurodegenerative diseases, head injury, and strokes.

2.3. Neuropsychological battery

The UDS neuropsychological battery was originally constructed to cover the most common domains in aging and dementia. It was constructed using brief tests or a subtest from formal neuropsychological tests [5]. The Spanish version was translated in consensus by the Spanish Translation and Adaptation Work Group (STWAG), became available online in April 2007 [8], and can be found online at the NACC website [11]. It consists of the following measures.

2.3.1. Orientation and cognitive screens

The Mini-Mental State Examination [10] is a 30-item-based examination used to assess orientation, attention, registration, recall, and language.

2.3.2. Verbal episodic memory

Logical Memory Immediate and Logical Memory Delayed [12] is a task in which participants are read a short story and then asked to recall the information (immediate recall). After 20 minutes, the participant is asked to recall the story (delayed recall).

2.3.3. Attention

Digit Span Forward and Backward [13] is a measure of auditory attention and working memory. The Trail Making Test Part A [12] assesses psychomotor and visuospatial tracking speed.

2.3.4. Semantic memory and language

Category Fluency [14] is a timed task that assesses the ability to produce words belonging to a specific semantic category (animals and vegetables). The Boston Naming Test [15], a 30-item Spanish version of the Boston Naming Test as selected and translated by STWAG [8], is a test of visual confrontation naming to assess word-finding ability. Psychomotor Speed and Visuospatial Function: Digit Symbol [12] is a timed task that assesses visual attention, scanning, coding, and graphomotor speed.

2.3.5. Executive function

Trail Making Test Part B [16] assesses cognitive flexibility and requires the participant to alternate between numbers and letters in sequence.

2.4. Statistical analysis

Descriptive analyses of demographics and neuropsychological data in Spanish speakers with normal cognition were conducted. Tabular summaries and regression methods are presented in the neuropsychological data from subjects with normal cognition. The covariates of interest in these analyses were sex, age, and education.

Regression analysis of the neuropsychological scores were conducted first using a univariate model adjusted for sex, age, and education separately and then using a multivariate model adjusted for sex, age, and education together. For the delayed recall score (Logical Memory A Delayed), the above analyses were also adjusted for the time interval (Logical Memory A Delayed length of time delay). The Trail Making scores (Parts A and B) were log-transformed before applying the above regression analysis. All summaries were performed using SAS 9.2.