highlights the importance of considering neuropsychiatric symptoms as well as cerebral volumes as key factors in the development of MCI in PD.

Categories: Neurodegenerative Disorders
Keyword 1: mild cognitive impairment
Keyword 2: Parkinson's disease
Keyword 3: neuroimaging: structural
Correspondence: Lyna Mariam El Haffaf. Department of psychology, Faculty of Arts and Science, Université de Montréal, Québec, Canada. Centre de Recherche de l'Institut Universitaire de Gériatrie de Montréal. lyna.mariam.el.haffaf@umontreal.ca

63 Examining TOPF Performance in a Neurodegenerative Population

Kimberly E Leib, Samantha A Sciulli, Christopher H Domen, Michael R Greher
University of Colorado School of Medicine, Denver, CO, USA

Objective: Cognitive tests on which performance is unrelated to brain pathology are considered "hold" tests and are often used to estimate cognitive abilities prior to injury or disease. Amongst the most commonly used "hold" tests are measures of irregular word reading, such as the Test of Premorbid Functioning (TOPF). Measures of irregular word reading assess ability to accurately pronounce phonetic irregularities based on prior experience and word knowledge, and tend to be insensitive to most forms of brain pathology (Lezak, 2012). However, research examining whether a relationship exists between neurodegenerative diseases and decline in irregular word reading is limited. The few studies completed have demonstrated a decline in irregular word reading in neurodegenerative disease in general (Berg, Durant, Banks, & Miller, 2016) and Alzheimer's dementia specifically (McFarlane, Welch, & Rodgers, 2006). However, no known research has been published examining whether irregular word reading and TOPF scores differ depending on cognitive classifications commensurate with DSM-V diagnoses (i.e., mild or major neurocognitive disorder, etc.), or presumed neurological etiology.
Participants and Methods: Patients were enrolled from the University of Colorado Hospital Neuropsychology Clinic. This study was a retrospective review of consecutive referrals over the age of 65 to the University of Colorado Hospital Neuropsychology Clinic from 2019 to present. The TOPF was administered along with a full neuropsychological battery and patients were clinically classified by severity of cognitive impairment (e.g., Normal, Mild Neurocognitive Disorder, Major Neurocognitive Disorder) and presumed neurologic etiology (e.g., Alzheimer's disease (AD), Parkinson's disease (PD), vascular cognitive impairment (VCI), and mixed dementia (AD and VCI). TOPF Raw scores were used for all analyses. Correlation analysis was conducted to determine significant relationships between various demographic variables and TOPF performance. ANCOVA analyses were conducted to examine differences on TOPF performance by diagnostic classification and differences on TOPF performance by presumed neurologic etiology.
Results: Correlation determined a significant relationship between TOPF performance and education ($r = .51$, $p < .001$), but not age ($p = .092$) or gender ($p = .680$). ANCOVA revealed a significant effect of TOPF performance on diagnostic group classification after controlling for education, $F(2, 504)= 26.45$, $p < .001$. Post hoc analysis revealed that those diagnosed with Major Neurocognitive Disorder performed the worst on the TOPF ($M=39.801 \pm .958$), followed by those diagnosed with Mild Neurocognitive Disorder ($M= 45.371 \pm .767$), while those diagnosed as cognitively normal performed the best ($M= 49.826 \pm .993$). Additional ANCOVA analysis revealed a significant effect of TOPF performance on presumed neurologic etiology after controlling for education, $F(3,148)=6.07$, $p = .001$. Post hoc analyses revealed that participants with suspected AD ($M= 40.728 \pm 1.613$) and those with suspected VCI ($M= 32.804 \pm 3.480$) performed worse on the TOPF compared to those with suspected PD ($M=46.964 \pm 1.506$), ($p=.042$ and $p = .004$, respectively).
Conclusions: Results suggest that TOPF performance in older individuals is sensitive to cognitive impairment. Furthermore, these results suggest that this sensitivity may be further influenced by presumed neurologic etiology. These findings are consistent with prior studies which demonstrated a decline in irregular word reading in individuals with neurodegenerative diseases.

Categories: Neurodegenerative Disorders

https://doi.org/10.1017/S1355617723007348 Published online by Cambridge University Press

Keyword 1: premorbid functioning
Keyword 2: dementia - other cortical
Keyword 3: assessment
Correspondence: Michael R. Greher, PhD, University of Colorado School of Medicine, michael.greher@cuanschutz.edu

64 Neuroimaging Evidence of Neurodegenerative Disease in Former Professional American Football Players Who "Fail" Validity Testing: A Case Series

Ranjani Shankar[1], Julia Culhane[2], Leonardo Iaccarino[1], Chris Nowinski[2], Nidhi Mundada[1], Karen Smith[1], Jeremy Tanner[1], Charles Windon[1], Yorghos Tripodis[2], Gustavo Mercier[3], Thor D Stein[2], Anne C McKee[2], Robert A Stern[2], Neil Kowall[2], Bruce L Miller[1], Jesse Mez[2], Ron Killiany[2], Gil D Rabinovici[1], Michael L Alosco[2], Breton M Asken[4,1]
[1]UCSF Memory and Aging Center, San Francisco, CA, USA. [2]Boston University, Boston, MA, USA. [3]Boston Medical Center, Boston, MA, USA. [4]University of Florida, Gainesville, FL, USA

Objective: Former professional American football players have a high relative risk for neurodegenerative diseases like chronic traumatic encephalopathy (CTE). Interpreting low cognitive test scores in this population occasionally is complicated by performance on validity testing. Neuroimaging biomarkers may help inform whether a neurodegenerative disease is present in these situations. We report three cases of retired professional American football players who completed comprehensive neuropsychological testing, but "failed" performance validity tests, and underwent multimodal neuroimaging (structural MRI, Aβ-PET, and tau-PET).
Participants and Methods: Three cases were identified from the Focused Neuroimaging for the Neurodegenerative Disease Chronic Traumatic Encephalopathy (FIND-CTE) study, an ongoing multimodal imaging study of retired National Football League players with complaints of progressive cognitive decline conducted at Boston University and the UCSF Memory and Aging Center. Participants were relatively young (age range 55-65), had 16 or more years of education, and two identified as Black/African American. Raw neuropsychological test scores were converted to demographically-adjusted z-scores. Testing included standalone (Test of Memory Malingering; TOMM) and embedded (reliable digit span, RDS) performance validity measures. Validity cutoffs were TOMM Trial 2 < 45 and RDS < 7. Structural MRIs were interpreted by trained neurologists. Aβ-PET with Florbetapir was used to quantify cortical Aβ deposition as global Centiloids (0 = mean cortical signal for a young, cognitively normal, Aβ negative individual in their 20s, 100 = mean cortical signal for a patient with mild-to-moderate Alzheimer's disease dementia). Tau-PET was performed with MK-6240 and first quantified as standardized uptake value ratio (SUVR) map. The SUVR map was then converted to a w-score map representing signal intensity relative to a sample of demographically-matched healthy controls.
Results: All performed in the average range on a word reading-based estimate of premorbid intellect. Contribution of Alzheimer's disease pathology was ruled out in each case based on Centiloids quantifications < 0. All cases scored below cutoff on TOMM Trial 2 (Case #1=43, Case #2=42, Case #3=19) and Case #3 also scored well below RDS cutoff (2). Each case had multiple cognitive scores below expectations (z < -2.0) most consistently in memory, executive function, processing speed domains. For Case #1, MRI revealed mild atrophy in dorsal fronto-parietal and medial temporal lobe (MTL) regions and mild periventricular white matter disease. Tau-PET showed MTL tau burden modestly elevated relative to controls (regional w-score=0.59, 72nd%ile). For Case #2, MRI revealed cortical atrophy, mild hippocampal atrophy, and a microhemorrhage, with no evidence of meaningful tau-PET signal. For Case #3, MRI showed cortical atrophy and severe white matter disease, and tau-PET revealed significantly elevated MTL tau burden relative to controls (w-score=1.90, 97th%ile) as well as focal high signal in the dorsal frontal lobe (overall frontal region w-score=0.64, 74th%ile).
Conclusions: Low scores on performance validity tests complicate the interpretation of the severity of cognitive deficits, but do not negate the presence of true cognitive impairment or an underlying neurodegenerative disease. In the rapidly developing era of biomarkers, neuroimaging tools can supplement neuropsychological testing to help inform

https://doi.org/10.1017/S1355617723007348 Published online by Cambridge University Press