

Is Adult Attention-Deficit Hyperactive Disorder (ADHD) a Risk Factor for Dementia? A Closer Look from Neuropsychological Perspective

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INTRODUCTION

- There has been an increase of ADHD being diagnosed in adulthood and in late adulthood (Barkley et al, 2002¹).
- Recent studies have emerged focusing on ADHD as a potential risk factor for dementia (Seidman, 2006⁴; Golimstok et al, 2010²; Ivanchok et al, 2012³). However, these studies are scarce and were conducted outside of the United States.
- The objective of this study is to examine neuropsychological features that are convergent and divergent, between ADHD and Dementia.
- To do this, the neuropsychological profiles of an individual with ADHD and one with Frontal-Temporal Dementia (FTD) will be examined and delineated.

METHOD

- Neuropsychological examinations were conducted at University of Miami, Leonard Miller School of Medicine, Department of Psychiatry.
- Both of these individuals were seen in 2017 and one month apart from each other. Pt-1 (ADHD) was seen in February, while Pt-2 was seen in January.

Table 1. Demographic Information

| Patient 1 | Rx Referral | Measures |
|---|--|---|
| Age: 34 yrs Gender: Male Ethnicity: Hispanic Education: 12 yrs | <ul style="list-style-type: none"> • Patient was referred due to complains of inattention and concentration since childhood. • He was subsequently diagnosed with ADHD. | <ul style="list-style-type: none"> • CVLT-2 • Trails A and B • WAIS-IV: <ul style="list-style-type: none"> -PSI -WMI -BD -Vocabulary • WMS-IV: <ul style="list-style-type: none"> -LM I-II • BVMT-R Delayed • WSCT-128 |
| Patient 2 | Rx Referral | Measures |
| Age: 67 yrs Gender: Male Ethnicity: Hispanic Education: 12 yrs | <ul style="list-style-type: none"> • Memory complaints and behavioral disturbances with progressive symptoms worsening the past year. • identified as meeting criteria for Major Frontotemporal Neurocognitive Disorder. | <ul style="list-style-type: none"> • WHO-UCLA • Trails A and B • WAIS-III Sp: <ul style="list-style-type: none"> -PSI -WMI -BD -Vocabulary • WMS-III Sp: <ul style="list-style-type: none"> -LM I-II • BVMT-R Delayed • WSCT-128 |

RESULTS

Table 2. Neuropsychological Test Results for Patient 1: ADHD

| Assessments | Standard Scores | Percentile | Descriptor |
|---|-----------------|------------|-------------|
| Pre-Morbid IQ/Vocabulary | 98 | 44% | Average |
| Digit Span | 75 | 5% | Borderline |
| TMT-A | 100 | 50% | Average |
| Coding | 80 | 9% | Low Average |
| TMT-B | 80 | 9% | Low Average |
| WCST Trials to complete 1 st category | 53 | <1% | Impaired |
| Block Design | 85 | 16% | Low Average |
| COWAT | | | |
| Phonemic | 80 | 9% | Low Average |
| Semantic | 75 | 5% | Borderline |
| CVLT-2: Immediate | 70 | 2% | Borderline |
| CVLT-2: Delayed | 63 | <1% | Impaired |
| LM-I | 55 | <1% | Impaired |
| LM-II | 55 | <1% | Impaired |
| BVMT-R- Delayed | 55 | <1% | Impaired |

Table 3. Neuropsychological Test Results for Patient 2: FTD

| Assessments | Standard Scores | Percentile | Descriptor |
|---|-----------------|------------|-------------|
| Pre-Morbid IQ/Vocabulary | 90 | 25% | Average |
| WAIS-III Sp: Digit Span | 70 | 2% | Borderline |
| TMT-A | 95 | 32% | Average |
| WAIS-III Sp: Coding | 80 | 9% | Low Average |
| TMT-B | D/C | N/A | D/C |
| WCST Trials to complete 1 st category | 55 | <1% | Impaired |
| WAIS-III Sp: Block Design | 95 | 32% | Average |
| COWAT | | | |
| Phonemic | <55 | <1% | Impaired |
| Semantic | <55 | <1% | Impaired |
| WHO-UCLA: Immediate | 55 | <1% | Impaired |
| WHO-UCLA: Delayed | 55 | <1% | Impaired |
| WMS-III Sp: LM-I | 70 | 2% | Borderline |
| WMS-III Sp: LM-II | 65 | <1% | Impaired |
| BVMT-R- Delayed | <55 | <1% | Impaired |

- **Pre-Morbid Functioning**
 - Results indicate a pre-morbid level of functioning in the average range for Pt 1 and 2.
- **Convergent Data:**
- **Deficits**
 - **Set-Shifting:** Both scored in the ≤1st percentile on trials to complete 1st category on the Wisconsin Card Sorting Test.
 - **Learning and memory:** Significant low scores on immediate and delayed verbal memory on California Verbal Learning Tests-2 (CVLT-2)/WHO-UCLA, Logical Memory-(LM). Low scores on delayed visual memory were obtained on the Brief Visuospatial Memory Test-Revised (BVMT-R).
 - **Attention and concentration:** Mild to moderate impairment were also observed across both patients, as they scored in the 2-5th percentiles on WAIS-Digit Span.
 - **Language:** Low scores were obtained on semantic fluency (Animals) abilities.

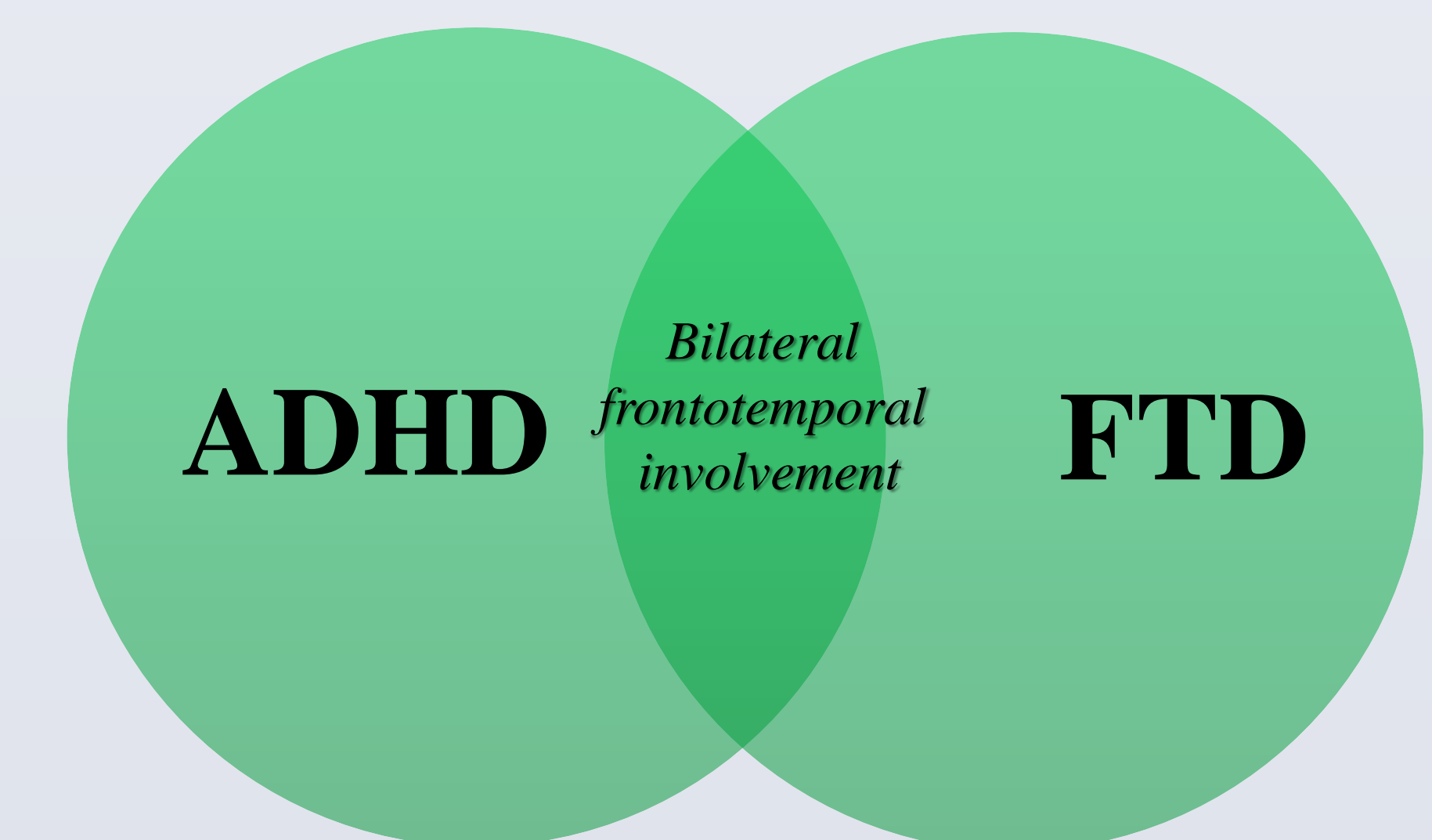
Preserved

- **Processing Speed:** Low average to average scores on WAIS-Coding and TMT-A suggest reductions but still preserved
- **Visuoperception:** Both performed in the average ranges, suggesting preserved functioning as evidenced by performance on WAIS-Block Design.

Divergent Data:

- **Language:** Phonemic for Pt-1 were in the low average range; however, Pt-2 demonstrated impaired scores.
- **Cognitive Flexibility:** Cognitive flexibility as measured by TMT-B was in the 9th percentile for Pt-1, while Pt-2 was discontinued secondary to significant difficulties

CONCLUSIONS



- Overlapping deficits and significant reductions in measures of rote, episodic, visual memory, attention, semantic ability, and executive functioning between Adult ADHD and FTD patients were observed.
- These findings implicate bilateral frontotemporal involvement, such as the dorsolateral cortex, medial frontal lobe, and the medial temporal lobe.
- There findings raise the viable question as to whether Adult ADHD represents a potential risk factor for FTD, as suggested by studies^{2,3,5}. This relationship should be explored longitudinally.

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