Use of a Computerized Assessment Tool in Individuals with a History of Seizures

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Introduction

Cognitive decline in individuals with seizures can occur as a result of seizure activity, treatment methods, and underlying pathology.

Neuropsychological testing is invaluable in monitoring cognitive functioning but is often resource-intensive. Factors such as seizure focus and type, disease progression, and treatment side effects add to viability in cognitive functioning.

In response, computerized tools like the FDA-approved Cognivue Clarity® offer a quicker alternative, assessing memory, executive function/attention, discrimination, visuospatial skills, and overall cognitive functioning in 10–20 minutes.

This study aimed to evaluate the effectiveness of Cognivue Clarity® in individuals with a history of seizures as compared to the existing, gold-standard pencil-and-paper measures. The pencil-and-paper measures included the CVLT-3 (memory), WAIS-IV Visual Puzzles (visuospatial), and DKEFS Verbal Fluency, Trail Making, and Color-Word Interference Tests (executive).

Methods

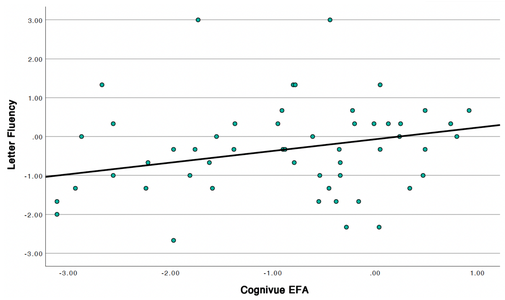
Participants: The study cohort included adults with a history of seizures who completed a traditional pencil-and-paper neuropsychological assessment and the Cognivue Clarity® computerized assessment in an outpatient community neurology clinic.

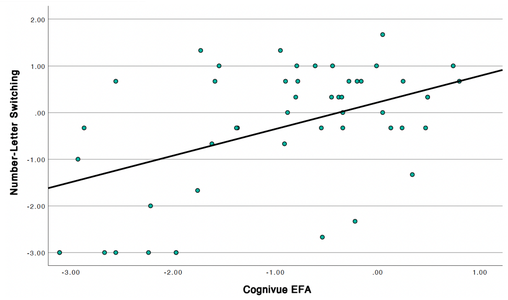
- 61 adults (33 men, 28 women) aged 20 to 80 years (M = 50.82 ± 19.78 years).
- Average years of education: 15.10 ± 2.49 years.

Statistical Analysis: Pearson's correlation coefficient was used via IBM SPSS Statistics Version 28 to analyze correlations between Cognivue Clarity® domains (memory, visuospatial functioning, and executive function/attention) and traditional neuropsychological measures assessing verbal memory, visuospatial functioning, and executive functioning.

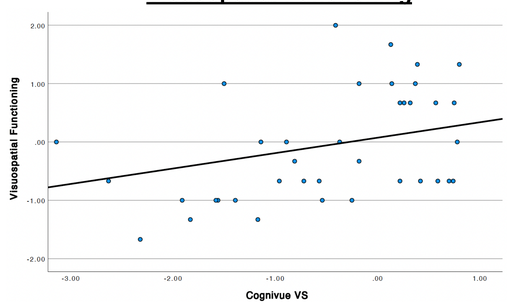
Results

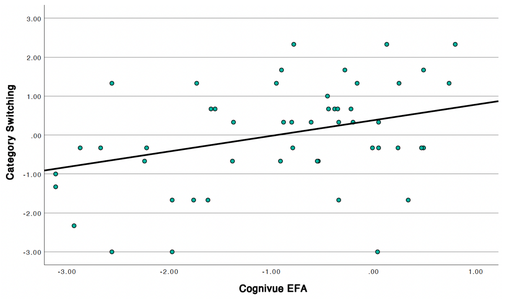
Executive Functioning

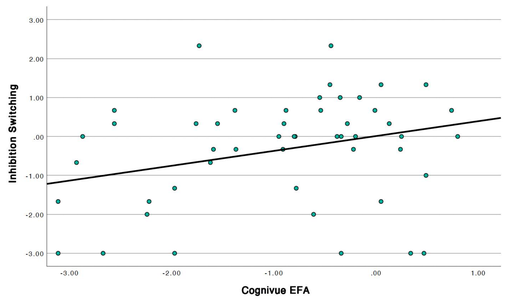




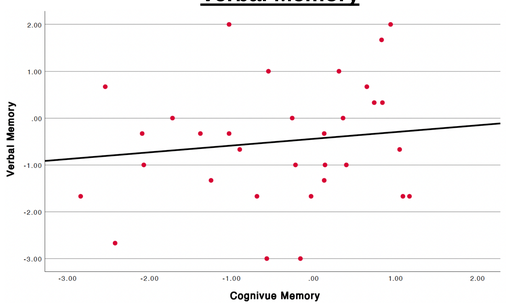
Visuospatial Functioning







Verbal Memory



- **Significant positive** correlations between Cognivue Clarity® and a traditional measure of visuospatial functioning ($r_{(43)}$ = 0.449, p = 0.003) and four measures of executive functioning, including letter fluency ($r_{(60)}$ = 0.375, p = 0.003), category switching ($r_{(56)}$ = 0.441, p < 0.001), number-letter switching ($r_{(55)}$ = 0.575, p < 0.001), and inhibition switching ($r_{(54)}$ = 0.378, p = 0.005) were observed.
- Correlations between Cognivue Clarity® and traditional memory measures were not significant (p > 0.05).

Discussion

These findings suggest that Cognivue Clarity® may be a suitable tool for screening assessments in individuals with a history of seizures. Considering the reliance on serial monitoring and integrating multiple clinical tools in managing this population, Cognivue Clarity® offers a potentially efficient, effective, and expedient option for enhancing comprehensive patient care.

Although the association between Cognivue Clarity® and traditional memory measures was not statistically significant, this outcome likely reflects the inherent limitations of brief screening tools for assessing memory. It is more appropriate to conceptualize this task as one assessing immediate recognition. Consequently, the inclusion of a full neuropsychological evaluation remains crucial in cases where further cognitive assessment is warranted.

Future studies could focus on examining Cognivue Clarity® performance across diverse seizure types and etiologies. Comparative analyses between Cognivue Clarity® and other computerized cognitive tools, along with evaluations of its utility in serial monitoring of cognitive function, may further elucidate its clinical applicability and value.

References

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