An Analysis of Individuals With Seizures on Anti-Seizure Medication Performance on a Brief Computerized Assessment

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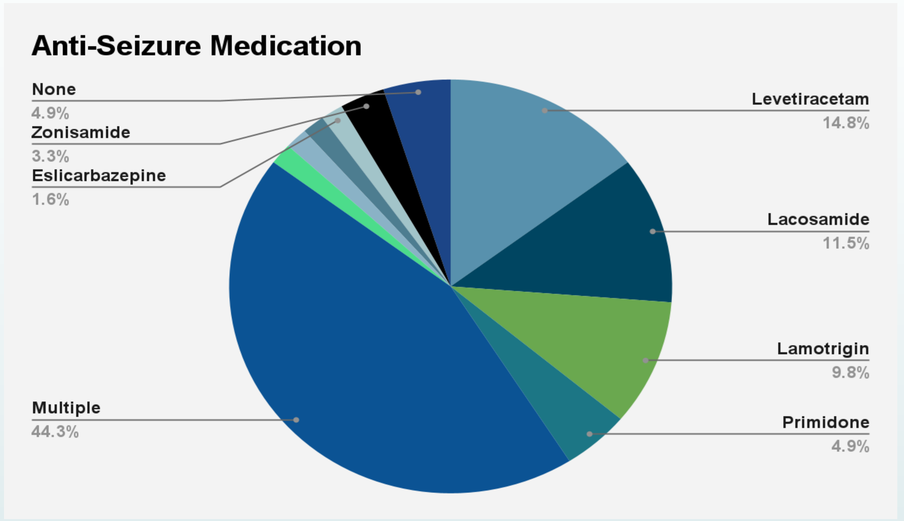
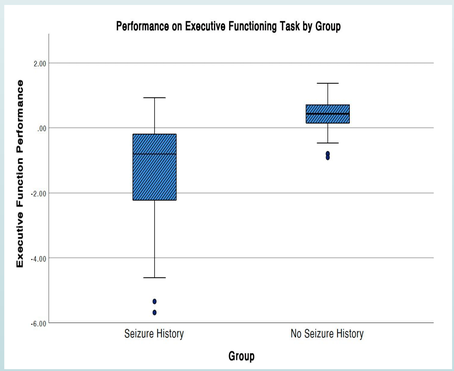
Background

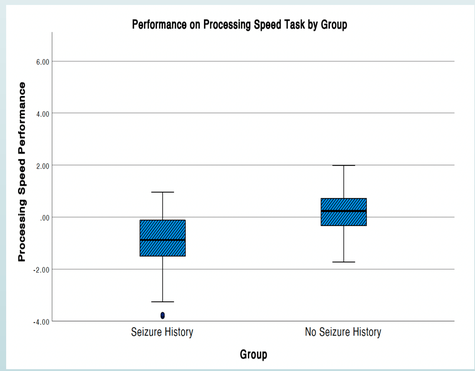
- Due to the impact of seizure activity and anti-seizure medication (ASM) side effects, cognitive decline is prevalent amongst individuals with seizure disorders. As a result, individuals experiencing seizures commonly undergo neuropsychological testing to assess cognitive functioning.
- The FDA-approved Cognivue Clarity is a computerized cognitive assessment that takes up to 20 minutes to complete and assesses across all cognitive domains.
- This study explored the impact of seizures and ASMs on processing speed, executive functioning, and adaptive motor control performance (as measured by the Cognivue)

Participants

- The study population consisted of individuals with a history of seizures and ASM treatment (n =61) and a comparison group of individuals with no seizure history (n =61).
  - 33 were men
  - Age: 20 to 82 (M = 50.81, SD = 19.43)
  - Years of edu: 10 to 22 (M = 15.09, SD = 2.42)
- The comparison group consisted of 61 individuals without any seizure history
  - 33 men
  - Ages 21 to 79 (M = 50.09, SD = 15.54)
  - Education: 12 to 20 (M =15.47 SD = 2.29)
- Mann-Whitney U tests revealed no significant differences in age (p = 0.695), education (p = 0.333), or gender (p = 1.000) between both groups







Methods

- Both groups completed computerized cognitive testing with Cognivue Clarity at a community hospital neurology clinic.
- Group statistics were analyzed using IBM SPSS Version 28, focusing on executive functioning, processing speed, and AMC.
- A further analysis was done using one way ANOVA to see ASMs effect on processing speed, executive functioning, and adaptive motor control performance.

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Results

- Individuals with seizures had lower performance on executive functioning tasks compared to individuals without , t(120) = -8.11, 95% CI {-2.11, -1.27}, p < .001.
- Processing speed in individuals with seizures was slower, t(120) = -5.06, 95% CI {-1.37, -.60}, p < .001.
- Adaptive motor control (AMC) performance amongst individuals with seizures was slower, t(120) = -1.96, 95% CI {-.5663, .0036}, p < .001.
- Performance across measures of executive functioning, processing speed and AMC did not significantly differ across medication groups (e.g., lamotrigine, lacosamide, and multiple ASMs).

Discussion

- Individuals with seizures showed significantly lower executive functioning, processing speed, and AMC than those without.
- Performance did not differ as a function of medication.
- These findings highlight the importance of serial assessment in individuals with seizure disorders to inform treatment planning (e.g., changing ASMs, surgical interventions, device implantation).
- Future research comparing pre-ASM baseline cognitive functioning to post-ASM-initiation would be of great benefit.