Modulation of P300 by Cognitive Enhancement Therapy in Early Course Schizophrenia

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Background

- Cognitive enhancement therapies (CET) aim to treat cognitive symptoms of schizophrenia (SZ) [1,2]. However, little is known about the brain mechanisms underlying associated cognitive changes seen in clinical trials.

- The current study seeks to determine if CET significant effects cognitive markers such as the P300 [3,4] and neuropsychological testing scores, as targets for potential mechanisms for cognitive changes seen in clinical trials.
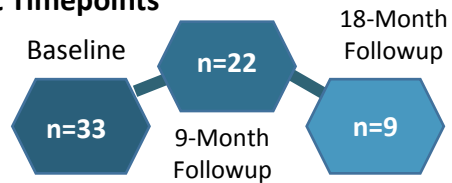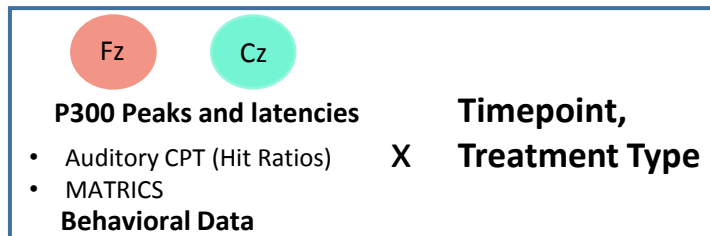
Methods

Single Blind Study of early cure SZ Patients
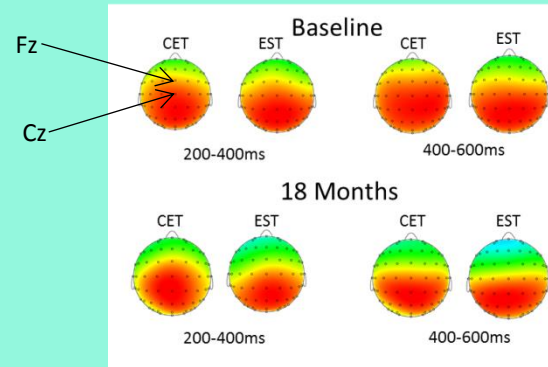
CET (n=18)   EST (n=15)

Assessment Timepoints

Baseline
n=33
9-Month Followup
n=22
18-Month Followup
n=9

Mixed Model Analysis

Fz   Cz

P300 Peaks and latencies
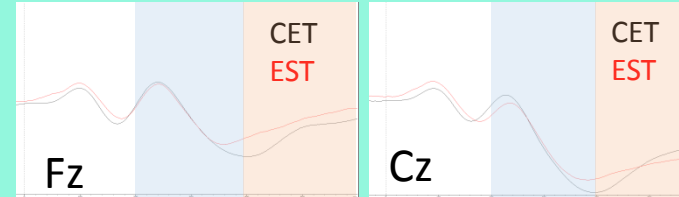- Auditory CPT (Hit Ratios)   X   **Timepoint, Treatment Type**
- MATRICS

Behavioral Data

Results

ERP Results: No significant group differences in P300 latency were found at Cz, or in P300 voltages at Fz or Cz.

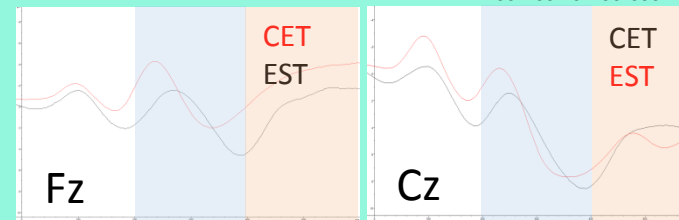Baseline — CET, EST (200-400ms), CET, EST (400-600ms)
18 Months — CET, EST (200-400ms), CET, EST (400-600ms)

Pairwise Compairsons—Fz Latency (CET Treatment Group)				
	Difference	Std. Error	df	sig
Baseline -> 9M	5.237	31.410	31.514	0.869
Baseline -> 18M	111.250	45.295	38.070	**.019***
9M -> 18M	106.014	44.930	29.123	**.025***

Baseline   200-400ms   400-600 ms

Fz — CET, EST   Cz — CET, EST

18 Months   200-400ms   400-600 ms

Fz — CET, EST   Cz — CET, EST

Results, Continued

Neuropsychological Testing Results: No significant group differences were found in the Q3A-Memory and Q3A-Interference paradigms of the Auditory CPT, or MATRICS CPT, OCS, or SOP subscores.

Aud. CPT— QA Hit –to- Miss Ratio	Estimate	Std. Error	df	t-value	sig
Intercept	0.956822	0.016121	33.94	59.353	**<2e^-16***
Timepoint	0.002164	0.001647	9.17	1.314	0.2206
Treatment	0.016311	0.024201	34.29	0.674	0.5048
Timepoint* Treatment	-0.006271	0.002502	12.83	-2.507	**0.0264***

(Baseline -> 18 Months)

Discussion

- While there may be some effect of CET on P300 latency in SZ, the relationship is unclear. The analyses performed are preliminary, with more participants completing follow-up assessments in the coming weeks.

- Participants in the CET group showed smaller P300 latencies between baseline and 18 months, showing some promise for CET's efficacy as measured by attentive-dependent ERPs.

- Those in the CET group had a higher hit-to-miss ratio on the QA paradigm of an auditory continuous performance task, which indicates that auditory attentive skills may be better-maintained in CET.

Works Cited

Please see handout for complete bibliogrpahy.