SADAR PSYCHOLOGICAL AND SPORTS CENTER

BIOMARKER EVALUATION REPORT

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Executive Summary of Results and Recommendations

Name:	Adult Female	Date of birth: Sex:	12.17.1990 f
Recording Date:	01.20.2023	Referred by: Dr. Smith	
Medication(s)	Wellbutrin, Lexapro, Propranolol (as needed)		
Evaluator	Andrea Meckley Kutyana, PhD, BCN, BCB, QEEG-T		
Reason for evaluation	Anxiety and depression		

SUMMARY OF FINDINGS

Questionnaire	Significant Self-Reported Responses
Amen	The answers indicate a slight level of strain in the cingulate cortex, also a high level of strain in basal ganglia and deep limbic system.
van Deusen	Functions that have been allocated to the left hemisphere are significantly more affected. Functions of the left medial temporal lobe are strongly affected. Functions of the supplementary and premotor cortex are strongly affected.
ADHD	Criteria met for inattention.

VISUAL CONTINIOUS PERFORMANCE TASK

Data	Within Normal Limits	Statistically Significant
Omission	Yes	
Commission	Yes	
Reaction Time	No	Slightly slow reaction time
Reaction Time Variability	Yes	

NEUROLOGIST EEG FINDINGS: Within Normal Limits: Yes

Description: A review by a board certified neurologistnoted a posterior dominant rhythm at 8.5-10.5 Hz with only mild to moderate attenuation with eye opening. Brief drowsiness was demonstrated. This EEG is reported to be without diagnostic abnormality for age in the awake and drowsy states.

qEEG FINDINGS

Results	Description
Slower alpha component	Slower 8.06 Hz alpha component is noted, maximal in the left posterior temporal region with eyes closed.
Alpha remains prominent	Alpha remains prominent with eye opening (maximal in the right mid temporal region BA 7) and during the task.
Theta/beta ratios increased	Significantly increased theta/beta ratios in all locations and all conditions.
Arousal index reduced	Significantly reduced arousal in all conditions
ADHD Index	Severe attention issues are predicted largely due to Cingulate dysregulation
Vigilance Decrement	In Go task: steep slope in perception with flat slope during relaxation; overall low variability

EVOKED RESPONSE POTENTIALS

Components	Early potentials		Mid potentials		Late potentials	Specific pattern
	Amplitude	Latency	Amplitude	Latency		
Visual Input			high	late	-	N1 Stress Marker No
Auditory Novelty			-	-	-	
Left Association Areas	-	-	-	-	-	
Right Association Areas	-	-	-	-	-	
Left Memory	-	-	-	-	-	
Right Memory	-	-	-	-	-	
Engagement	-	-	-	-	-	N2 Attention Marker No
Inhibition/Suppression	low	-	low	-	-	
Monitoring	low	-	low	-	-	
Working Memory						
Slow Wave Activity						
Readiness Potential						

DISCUSSION:

There are several findings of interest in Adult Female's evaluation. First, she has an alpha rhythm in the healthy range at 9.77 Hz, however, a slower alpha component is noted at 8.06 Hz, maximal in the posterior and temporal regions with LORETA estimating the source to be Brodmann area 7. This activity also remains prominent with eye opening and during the task and contributes to the significant increase in slow wave activity, increased theta/beta ratios, and the reduced arousal index. Alpha is considered the brain's idling rhythm and typically found between 9-11 Hz. Individuals with a slower alpha rhythm may process information slowly (consistent with the late latency of the visual ERP and slower reaction times) and this pattern may have a negative impact on cognitive efficiency and mental sharpness in general.

Behaviorally, these patterns may be expressed as a lack of motivation and a lowered willingness towards effort. In unsecure situations, she might express fears and misgivings. A depressive mood modulation, significant unreal perception of everyday life, and loss of focus may also be observed. Second, several patterns in the ERPs and Vigilance suggest a pattern of initial intensity followed by reduced activation. This is evidenced by a high amplitude visual ERP suggesting high processing intensity, high amplitude of the Readiness Potential suggesting intense preparation for stimuli, and steep vigilance slope during the perception/memory phase of the Go task as well as overall reduced vigilance variability suggesting high inner tension when preparing to respond and overall rigidity. This initial intensity is then followed by low amplitudes of the later ERP components suggesting less control of monitoring processes leading to attentional errors, low activation of the limbic energy during decision making often defined by a state of indifference and perplexity and lack of resources after responding.

MARY OF RECOMMENDATIONS

MEDICATION

Recommended	Comments
No	Adult Female is currently taking medications that may be impacting the findings; therefore, no recommendations can be made at this time.

RECOMMENDATIONS FOR THERAPEUTIC INTERVENTIONS

Lifestyle	Recommended	Modifications Recommended
Daily Life	Yes	Routine and structure
Sleep	Yes	Review sleep hygiene and biofeedback
Diet	Yes	Review guidelines
Exercise	Yes	Meet daily minimum recommendations.
Drugs/Alcohol	No	
Electronics	Yes	Limit to 2 hours per day

Biofeedback	Recommended	
EEG- High Frequency Neurofeedback	Yes	Detailed information can be found in the recommendations section in the report
Heart Rate Variability	Yes	
Pir-HEG	Yes	
EMG	No	
Capnography	Consider evaluation	

Home Training	Recommended	
UNYTE/Mightier	Yes	Detailed information can be found in the recommendations section in the report

Additional	Recommended	Comments
Psychotherapy/Coaching	Yes	
Medical	Possibly	Consider nutritional/metabolic testing