SAND SCAN ASSESSMENT SUMMARY

SARS-Cov-2 Neurocognitive Decline Screening
4015 Aspen Grove Drive #1018
Franklin, TN 37067
615.405.4589

Client: Jane Doe
Date: October 22, 2022

S: Jane is a fifty year old Caucasian female who is presenting today for testing for neurocognitive impairment. She reports two infections. The first Estimated Date of Seroconversion was in March, 2020. The second Estimated Date of Seroconversion was in December of 2022. She reports cephalgia with both infections. She reports both dysgeusia with both infections and anosmia with the second infection. She reports the anosmia has resolved. Dysgeusia, in the form of altered taste, persists. She also reports diarrhea during the acute phase, which has yet to fully resolve.

O: Jane appears to be a WD/WN Caucasian female in no apparent distress. During the Zoom session, facial symmetry was noted, no eye or facial droop was appreciated. She was able to clearly articulate her thoughts during the interview. She was able to understand the questions asked and instructions given during the entire session.

A: Jane provided a number of labs for my review.
Lymphocyte Absolute CD3 Count: 1374
Lymphocyte Absolute CD8 Count: 469
Lymphocyte CD8%: 24.7
Lymphocyte Absolute CD4 Count: 927
Lymphocyte CD4%: 48.8
CD4:CD8 Ratio: 1.98

IFN-Gamma: 7.5
IL-10: 1.2
TNF-a: 14.0
IL-10/TNF-a Ratio: .08
VEGF: 231.6
sCD40L: 38,418.6

The assessment began with an interview process with the questions built upon the findings of viral persistence within the Central Nervous System reservoir[1].

We began the interview by discussing whether she had suffered from diarrhea and if so, had she experienced diarrhea for thirty consecutive days. She reported that she did in fact suffer from diarrhea during the acute phase of both infections but not for thirty consecutive days. She did report cachexia during the first infection, as evidenced by weighing ninety-five pounds at one point. According to

[1] *SARS-CoV-2 infection and persistence throughout the human body and brain.* https://assets.researchsquare.com/files/rs-1139035/v1_covered.pdf?c=1640020576

her, that has since resolved and she actually weighs more than she did before her first infection.

The interview continued, turning to questions that would indicate possible basal ganglia involvement. She reported difficulties with motivation, decision making, and working memory.

The questioning then turned to those that might suggest cerebral cortex involvement. She reported a difference in the language that she uses, frequently substituting words. She reported trouble with reasoning, thought, learning and decision making. She noted a change in her intelligence and personality. Additionally, she reported a change in the emotions she feels. She stated that she feels “depressed, frustrated, withdrawn, irritable.” She stated that she avoids interaction.

Jane was then asked questions that would suggest medulla oblongata involvement. She reports that while she struggled with dysphagia, it has since resolved. She reports that her breathing has changed. She also reports suffering from Postural Orthostatic Tachycardia Syndrome and at times, bradycardia. Her reporting of unresolved tinnitus may be indicative of direct vestibulocochlear involvement or due to the decussation that takes place at the level of the medulla.

We then moved to questions that would lead one to believe there is viral persistence in the cerebellum. She reports that she has fallen and bumps into things. She reports that she has struggled to maintain her balance, trouble coordinating her movements, issues with vision, and finally, motor learning. She revealed that someone asked her “Do you have ALS?” She reports that after the second infection, she has experienced trouble with sleeping, wakefulness, consciousness (feeling “detached”), learning, and with her memory. She feels “fatigued during the day.” Finds that she “easily falls asleep at night after work.”

In light of evidence of viral persistence within the thalamus, Jane was asked a number of questions that would indicate thalamic involvement. She reports having had an inability to regulate her body temperature, felling “very cold for a period of time.” Additionally, she reports the onset of blood pressure regulation issues. She reports “crashing” after eating a meal that is rich in carbohydrates. She has experienced mood changes. She has zero sex drive. She also reports having suffered from anhidrosis, which appears to have now resolved. With the infections came the onset of alcohol intolerance. She has also modified her diet, eliminating refined sugars.

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I then asked her a number of questions that would suggest hypothalamic involvement. Beyond vision problems, which has already been mentioned, she did note hypotonia, which could also be sarcopenia that has been observed with this virus. As a consequence of being in pain all of the time, she notes that her tolerance for pain has increased. She notes her ability to cook/follow recipes has decreased. Her daughter now helps with meals.

Next, we investigated possible corpus callosum involvement. She reports difficulty with problem solving and complex tasks. She does find understanding abstract concepts difficult. She now finds it difficult to understand sarcasm and slang. While transient, she now finds it difficult to understand emotions. Understanding social cues now prove to be "overwhelming." She reports becoming risk adverse. While she reports having become more obsessive-compulsive, she states that she is "limited in carrying out the obsessive compulsive behavior."

Additional comments captured:

She reported a twenty-three percent reduction in cerebral blood flow after having been returned to the normal position during the tilt table test.

She reports both situational and general depression. Additionally, reports attention deficit issues.

She stated that she cycles between diarrhea and constipation, which has gotten better with the use of probiotics.

She reports pain at the level of the medulla oblongata and cerebellum.

Next, a medication and supplement screening was done, based upon a document made available by UCSF[2]. She reported the use of Zyrtec.

Next the Montreal Cognitive Assessment was administered.

She received full points for the trail making test.

She received zero points for the cube portion of the test.

[2] A Healthcare Provider's Guide to HIV-Associated Neurocognitive Disorder (HAND): Diagnosis, pharmacologic management, non-pharmacologic management, and other considerations.
https://memory.ucsf.edu/sites/memory.ucsf.edu/files/wysiwyg/UCSF_HIV%20Dementia_Providers_11-6-17.pdf

She received two points for the clock portion of the test. No points were awarded for the hands portion.

She received full points for the naming portion of the test.

She was able to recall all five words for each of the trials within the memory portion of the exam.

She received full points for the digit span portion of the test.

She received zero points for the vigilance section, as a consequence of five errors.

She received one point for the serial section of the test, only able to subtract seven one time from one hundred.

She received full points for the sentence repetition portion of the exam.

She received full points for the fluency portion of the exam.

She received full points for the abstraction portion of the exam.

She was able to spontaneously recall four out of five words. She was unable to recall daisy with category or multiple choice cues.

She received five out of six points for the Orientation portion of the exam, unable to state the date.

Her Memory Index Score was 12.

Her MoCA score was twenty five out of thirty points.

P: I will perform further testing as Jane desires.

Following are some journal articles I believe worth sharing in light of her lab results.

Excess Soluble CD40L Contributes to Blood Brain Barrier Permeability In Vivo: Implications for HIV-Associated Neurocognitive Disorders
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3520914/pdf/pone.0051793.pdf

IL-10 in HIV infection: increasing serum IL-10 levels with disease progression—down-regulatory effect of potent anti-retroviral therapy
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1905221/