

Case study of a patient with Long COVID (Post-Acute Sequelae of SARS-CoV-2 Infection, PASC):

Including use of Hippotherapy in the Physical Therapy Plan of Care

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Biography: Michelle earned her Masters of Science in Physical Therapy from Boston University in 1999. Michelle has practiced physical therapy in public schools, a pediatric clinic and currently at Chastain Horse Park in Atlanta, GA where she can incorporate hippotherapy into her clinical practice. A year and a half ago, due to her teenage daughter developing long-covid (PASC), Michelle has had to use her clinical knowledge along with attending webinars and reading any available studies, preprint articles and published clinical guidelines to help determine how to help her daughter through the ongoing process of recovery from this new disease. In addition to her daughter participating in physical therapy in a local clinic, Michelle is also incorporating hippotherapy into the PT plan of care. (While ideally therapists would not typically treat their own family members, in this case, Michelle is the only PT in the area with the skill set to incorporate hippotherapy into a plan of care therefore she does that portion of the plan and oversees the HEP while other therapists manage the rest of her rehabilitation.)

Background

Within a few months of the onset of the COVID-19 pandemic, clinicians started to notice that some patients despite recovery from their acute infection, continued to have ongoing symptoms many weeks and months post infection. This collection of symptoms is now recognized as Long COVID or Post-Acute Sequelae of SARS CoV-2 Infection (PASC). According to the CDC, primary symptoms of Long Covid include: difficulty breathing or shortness of breath, tiredness or fatigue, symptoms worsen after physical or mental activities (also known as post-exertional malaise), difficulty thinking or concentrating ("brain fog"), cough, chest or stomach pain, headache, fast-beating or pounding heart (also known as heart palpitations), joint or muscle pain, paresthesias, diarrhea, sleep problems, fever, dizziness on standing (lightheadedness), rash, mood changes, change in smell or taste, and changes in menstrual period cycles. Many of these same symptoms are also seen in children and adolescents.

Purpose

To demonstrate incorporation of Hippotherapy into a PT plan for the treatment of long COVID.

Patient History

17-year-old female with history of asthma, vocal cord dysfunction, anxiety and food allergies, with a family history of auto-immune arthritis

Pt previously was an honors level student planning to graduate high school a year early who played volleyball, participated in school program riding lessons and volunteered as a side-walker and horse leader in therapeutic programs.

Patient History of Present Illness

In July 2020, at 16-½ years old, patient had known COVID-19 exposure. Symptoms included: fever, cough, fatigue, headache, body aches, nausea, diarrhea, altered sense of taste and loss of sense of smell. Acute symptoms persisted for 5 weeks.

After 4 weeks of acute symptoms, patient was admitted to local pediatric hospital due to vomiting and weight loss.

Patient History of Present Illness (continued)

- 4 hospital admissions over 2 months for GI symptoms
- NJ feeding tube to maintain weight
- Diagnosed with median arcuate ligament syndrome 11/2020
- Abdominal surgery to release the ligament causing compression of the celiac artery November 2020
- Post surgical numbness in left lower extremity affecting balance
- GJ feeding tube surgically placed in January 2021
- Narcolepsy diagnosed in March 2021

Current symptoms & diagnoses

- Brain fog
- Nausea and constipation
- Decreased balance
- PASC
- Fatigue (physical and cognitive)
- Narcolepsy
- Tachycardia (due to stimulants used for narcolepsy)
- Allergies & Chronic Urticaria
- Probable POTS/dysautonomia (in Jan. 2021 HR in supine 74, HR after 10 min standing 112, 38 bpm change)
- Hypogammaglobulinemia



Initial Assessment, July 2021:

- 6 minute walk test-6MWT: 721 feet=219.76 meters, exhausted after
- SLS eyes closed: R=30 secs, L=5.5 secs
- Tandem stance eyes closed: L lead=30 secs, R lead=5 secs
- Modified Fatigue Impact Scale (MFIS):

Total Score: 78/84

Physical Subscale: 34/36

Cognitive Subscale: 36/40

Psychosocial Subscale: 8/8



- HR supine:102, HR after 10 min standing:130, 28 bpm change

Avoiding trunk rotation and guarding around GJ tube with decreased use of abdominal muscles. Decreased sensation in L LE.

Neurologist & family noted patient to be making word errors during speech, have difficulty with simple math problems and processing directions and taking longer than would be expected to answer the questions asked on the neuro screening.

Long Term Goal: return to her prior level of function: full participation in physical activities or cognitive tasks. Life goals for the next year or two include going to a gap year program out of the country, starting college, being able to participate in school program riding lessons, volunteering in therapeutic riding or PT/OT sessions incorporating hippotherapy.

Initial Assessment, July 2021 (continued)

Short term goals:

- no napping during the day
- keeping pace with family while walking to/from appointments
- shower without using a shower chair
- decrease nausea and decrease use of feeding tube
- decrease constipation and medications for constipation

Treatment

July – August 2021:

- Modified Rate of Perceived Exertion Scale during therapy activities. Daily baseline was 3/10 & would rise to 8-9/10 with activity.
- Cognitive tasks – ex. point to alternating side letter chart in order
- Walking on treadmill at 1.5-1.7mph x10 mins x4 days/week
- **PT Sessions incorporating hippotherapy**, on a horse with rotation and lateral movements, include: stop/starts/half-halts, serpentines, circles of varying sizes, ascending/descending hills while patient engaged in trunk rotation, reaching outside base of support, and various cognitive activities including placing colored cones in specified order, simple addition problems, simple word games on phone.
- After sessions incorporating hippotherapy, pt would "crash" & take a few days to return to baseline. Napping after using treadmill. Fatigue worsened with cognitive tasks.

September 2021:

- Speech eval caused headache with 9/10 pain
- Daily headaches worsening with cognitive exertion
- Speech therapy sessions were discontinued as a result
- PT eval by therapist at another clinic. Sessions included general strengthening, balance exercises and cardio on a cycle ergometer. Pt would "crash" after sessions and require multiple naps and days to recover.

October 2021 – February 2022:

- Modified therapy sessions to follow **Mt. Sinai Autonomic Reconditioning Therapy Protocol** and **Stasis.Life** breathing protocols.
- Goals of sessions: RPE to not increase more than 2-3 points
- Therapy sessions include: breathing exercises, manual therapy for tightness in neck and shoulders, exercising in supine only.
- Walking on treadmill was suspended for 4 weeks
- Ongoing headaches so no cognitive activities during PT sessions.

Treatment (continued)

- **PT Sessions incorporating hippotherapy:** breathing using the Stasis App with eyes closed for balance and proprioception while the horse is led in stop/starts, serpentines, circles, ascending/descending hills, and over raised poles. Side-sitting or backwards to address mild vestibular dysfunction as noted when traveling and experiencing mild motion sickness.



Re-assessment, Nov. 2021

- 6MWT: 1,224 feet=373 meters, HR 125 & exhausted after
- SLS eyes closed: R=30 secs, L=8 secs
- Tandem stance eyes closed: L lead=30 secs, R lead=7 secs
- Modified Fatigue Impact Scale (MFIS):
Total Score: 71/84
Physical Subscale: 31/36
Cognitive Subscale: 34/40
Psychosocial Subscale: 6/8
- HR supine: 95, HR after 10 min standing: 120, 25 bpm change
- In December, Pt started on nadolol for tachycardia. Pt increased fluid intake, started taking salt pills and wearing thigh high compression stockings.

Re-assessment February 2022

- 6MWT: 1,224 feet=323 meters, HR 95, tolerated very well
- SLS eyes closed: R=40 secs, L=23.5 secs
- Tandem stance eyes closed: L lead=30 secs, R lead=30 secs
- Modified Fatigue Impact Scale (MFIS):
Total Score: 54/84
Physical Subscale: 25/36
Cognitive Subscale: 25/40
Psychosocial Subscale: 4/8
- HR supine: 78, HR after 10min standing: 83, 5bpm change
- Pt no longer napping, shower without shower chair, keeping up when walking to appointments, nausea has resolved, no longer using feeding tube (removed 12/5/21), and slight decrease in anti-constipation medications.



Conclusion

Incorporation of hippotherapy is appropriate in a physical therapy plan of care for a patient with Long COVID as long as patient is monitored for post-exertion symptom exacerbation and staying within the patient's energy limits.

