Improvement in vertigo, fatigue, and sleep quality following a program of multimodal neurorehabilitation

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INTRODUCTION

A 29-year-old female presented to the clinic with symptoms of vertigo, fatigue, and sleep disturbance that escalated after a pregnancy three years prior. Additionally, she had noticed tremors in both hands and cramping in both feet. She also reported "bad pain" in both hands and wrists. There was a previous diagnosis of Benign Paroxysmal Positional Vertigo (BPPV) in 2005. The patient claimed that "something internally is off." She was prescribed Meclizine to take as needed but did not find that it helped the vertigo symptoms.

METHODS

Neurological examination revealed positive Romberg's test with head neutral and head to the right. Finger-to-nose testing revealed intention tremor on the left. Downbeat nystagmus was observed with ophthalmoscopic examination and optokinetic nystagmus stimulation (OPK) was abnormal to the left. Saccodometry revealed a heteroscedastic distribution of 100 saccades in terms of latency, velocity and accuracy. Computerized Dynamic Posturography (CDP) revealed abnormal stability patterns including more stability with eyes closed than open. A multimodal neurorehabilitation program which included vestibular rehabilitation (VR) and spinal manipulative therapy (SMT) was initiated to address the neurological findings. VR included gaze-holding exercises, passive and active vestibular canal stimulation and multi-planar upper extremity movements on the right.

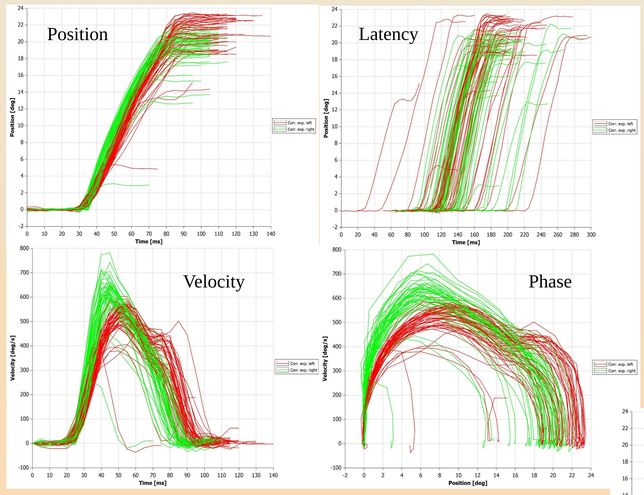
RESULTS

COMPUTERIZED DYNAMIC POSTUROGRAPHY

CDP showed improvement in stability scores. Center of pressure (CoP) on the firm surface with eyes open improved from a posterior CoP (A to P) of -1.7" to -0.06" and with eyes closed on a firm surface from -2.08" to -0.19" (A to P)

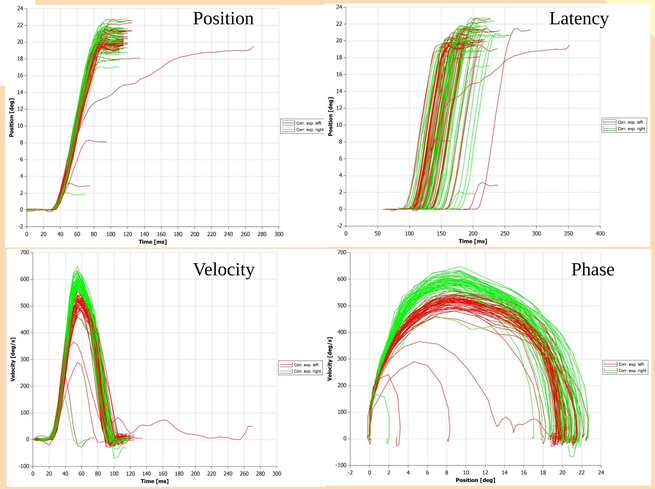
STATIC TEST: STABILITY SCORE	SURFACE	INITIAL EXAM	POST EXAM
Eyes open, head neutral	Firm	92.0%	94.9%
Eyes closed, head neutral	Firm	94.0%	93.5%
Eyes open, head neutral	Perturbed	83.5%	80.3%
Eyes closed, head neutral	Perturbed	64.0%	77.7%
Eyes closed, head right	Perturbed	62.1%	74.1%
Eyes closed, head left	Perturbed	65.3%	70.4%
Eyes closed, head flexed	Perturbed	71.1%	63.6%
Eyes closed, head extend	Perturbed	67.8%	unavailable

SACCODOMETRY



INITIAL EXAM: Plots show heteroscedastic distribution of 100 saccades in terms of latency. Leftward saccades also have a decreased velocity and are hypermetric compared to the rightward saccades.

POST EXAM: Plots show an improved distribution of 100 saccades in terms of balance between right and left velocity and phase curves. Latency plot shows an improvement from a heteroscedastic to a homoscedastic distribution.



RESULTS

The patient reported resolution of the vertigo within the first week of treatment. Romberg's test normalized during the first treatment. Intention tremor during finger-to-nose testing resolved. The downbeat nystagmus observed during ophthalmoscopic exam resolved. OPK stimulation normalized and became more balanced between right and left. The patient reported that the tremors in the hands and the cramps in the feet resolved. Treatment produced an increase in hours of continuous sleep. Improvement in quality of sleep also allowed the patient to start to dream. As a result, the fatigue improved.

CONCLUSIONS

This author recommends further investigation into multimodal neurorehabilitation treatment protocols that include vestibular rehabilitation and spinal manipulative therapy to address vertigo, sleep disturbance and fatigue. Further investigation is warranted into the relationship between saccade testing and computerized dynamic posturography.

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