

## Video Abstracts

## Improvement of Primary Writing Tremor in Parkinson's Disease with Carbidopa/Levodopa

James P. Battista<sup>1\*</sup> & Paul E. Greene<sup>1</sup><sup>1</sup> Mount Sinai School of Medicine, Movement Disorders Division, New York, NY, USA

### Abstract

**Background:** Primary writing tremor is a task-specific phenomenon that has been described as variants of essential tremor or dystonia.

**Phenomenology Shown:** We describe the case of a 63-year-old female who initially had primary writing tremor, later developed Parkinson's disease, and once initiated on carbidopa/levodopa had improvement in her parkinsonism and her writing tremor.

**Educational Value:** As neither essential tremor nor typical brachial dystonia respond to carbidopa/levodopa, our case documents that at least some cases of primary writing tremor are not variants of either dystonia or essential tremor.

**Keywords:** Primary writing tremor, Parkinson's disease, levodopa

**Citation:** Battista JP, Greene PE. Improvement of primary writing tremor in Parkinson's disease with carbidopa/levodopa. Tremor Other Hyperkinet Mov. 2015; 5. doi: 10.7916/D8WQ035T

\*To whom correspondence should be addressed. E-mail: james.battista@m Mountsinai.org

**Editor:** Elan D. Louis, Yale University, USA

**Received:** August 12, 2015 **Accepted:** September 25, 2015 **Published:** October 22, 2015

**Copyright:** © 2015 Battista et al. This is an open-access article distributed under the terms of the Creative Commons Attribution–Noncommercial–No Derivatives License, which permits the user to copy, distribute, and transmit the work provided that the original author(s) and source are credited; that no commercial use is made of the work; and that the work is not altered or transformed.

**Funding:** None.

**Financial Disclosures:** Dr. Paul Greene, MD, Johns Hopkins Botulinum toxin course.

**Conflicts of Interest:** The authors report no conflict of interest.

**Ethics Statement:** All patients that appear on video have provided written informed consent; authorization for the videotaping and for publication of the videotape was provided.

Around 1999, a 63-year-old female developed an action tremor in the right hand only when writing and then in 2010 developed a rest tremor in the right leg that progressed to the left leg. Through the years, the writing tremor was suppressed only by holding the wrist with the left hand. She did not find other writing positions improved it. There was no history of exposure to dopamine receptor blocking agents. Neither in 1999 nor in 2010 was there reported history of anosmia, rapid eye movement sleep disorder, constipation, or foot dystonia. On examination, she had decreased blink rate, rest tremor in the right hand and the legs bilaterally, mild to moderate bradykinesia in the arms and legs bilaterally, worse on the left, and decreased arm swing while walking. Action tremor was only present in her right hand when she wrote, causing tremulous handwriting. When she wrote with her wrist immobilized, the tremor improved markedly. There was no tremor noted on spiral drawing in either hand. Carbidopa/levodopa 25/100 was titrated to two tablets three times a day. A month later her Parkinson's disease symptoms were better. In addition, her tremulous handwriting had improved (Video 1).

The first account of primary writing tremor (PWT) was in 1979 in a patient that had pronation causing a tremor of the forearm solely with



**Video 1. Initial Examination Displays Rest Tremor on the Right Greater than Left and Bradykinesia Bilaterally Greater on the Left.** The task of writing is tremulous and with locked wrist the handwriting improves. After initiation of carbidopa/levodopa 25/100 two tablets three times a day, there was improvement in bradykinesia as well as tremor reduction in handwriting.

writing.<sup>1</sup> It was thought to be a variant of essential tremor (ET), a type of focal dystonia, or its own disease.<sup>2</sup> Medications reported to help PWT include oral agents used in essential tremor, such as primidone and propranolol, medications for dystonia such as trihexyphenidyl, and also botulinum toxin. So far, no cases of secondary PWT have been described in detail. There were reports of six patients with Parkinson's disease and PWT, five of them in abstract form only.<sup>3</sup> The five patients reported in abstract form were refractory to propranolol and primidone but, as with our patient, the writing tremor responded to carbidopa/levodopa. Our patient did not have dopa-responsive dystonia since, although significantly improved, she was not normal even on 600 mg of levodopa daily. Since neither ET nor typical brachial dystonia respond to carbidopa/levodopa, our case documents that at least some cases of PWT are not variants of either dystonia or ET. The question arises whether cases of PWT could be related to

Parkinson's disease and could be an early manifestation. What is the relationship and could there be a common physiology? As we have presented a single case, it is hard to make this determination; however, with more patients being observed with this phenomenon, it may be possible to evaluate this further.

### References

1. Rothwell JC, Traub MM, Marsden CD. Primary writing tremor. *J Neurol Neurosurg Psychiatry* 1979;42:1106–1114, doi: <http://dx.doi.org/10.1136/jnnp.42.12.1106>.
2. Rana AQ, Vaid HM. A review of primary writing tremor. *Int J Neurosci* 2012;112:114–118, doi: <http://dx.doi.org/10.3109/00207454.2011.635827>.
3. Smith K, Alawi A, Ramiro J, Chand P. Pronounced task specific writing tremor in Parkinson's disease (AAN Poster session III April 29, 2014). *Neurology* 2014;82, Supplement P3.079.