

EC Neurology

Editors, International Journal of Neuroscience

Dear Editors,

20 December 2015.

Parkinson Disease, Vestibular Tract, a New Awareness

Abraham Lieberman*, Aman Deep and Thurmon Lockhart

Bob & Renee Parsons Fall Prevention Center Drs Lieberman & Deep, Barrow Neurological Institute Phoenix & Arizona State University Tempe

***Corresponding Author:** Bob & Renee Parsons Fall Prevention Center Drs Lieberman & Deep, Barrow Neurological Institute Phoenix & Arizona State University Tempe, USA.

Received: December 19, 2015; **Published:** December 22, 2015

In March 2014 we published: *Distinguishing the tremor of Parkinson disease (PD) from essential tremor (ET): finger displacement [1]*. We studied 50 tremor- dominant PD patients: mean age 63.4 years, mean disease duration 4.9 years and 35 ET patients: mean age 64.1 years, mean disease duration 12.5 years.

Patients sat opposite the examiner and pointed both index fingers at the examiner's index fingers. They kept the point for 15 seconds. They then closed their eyes. Within 15 seconds, one or both of the patient's index fingers moved, was displaced upward, or laterally. All the PD patients exhibited displacement of the index finger. In 46 patients it occurred on the side of the dominant tremor. In 31 of 35 ET patients, no displacement occurred. The differences between the PD and ET patients were significant: $p = 0.0018$.

A follow-up article appeared in May 2014: *Finger displacement in Parkinson disease: Up? Down? Sideways?* We examined the phenomenon in 72 patients without tremor and 32 with minimal tremor to see if the displacement is related to the disease or the tremor. None of the 104 patients were demented: 68/72 patients without tremor, 94%, exhibited finger displacement suggesting the phenomenon is disease related. Ninety- six patients exhibited upward or lateral displacement of one or both index fingers. Eight patients exhibited downward displacement of one or both index fingers. We had no explanation for the phenomena, especially the downward displacement. We had not heard or read of it [2].

We were surprised when we read, recently, of a similar phenomenon described by the eminent English neurologist, consulting physician to the National Hospital for Nervous Disease, Queen Square, London, in his monograph *The Basal Ganglia and Posture*, published in 1967 [3]. Purdon Martin studied 68 patients with post- encephalitic Parkinson disease, survivors of the epidemic of 1919-1925. He studied postural fixation of the limbs in patients with disorders of balance and gait, disorders. These patients were often unable to fix their hips, shoulders, head and neck on their skeletal axis. This resulted in a variety of abnormal postures: head flexed on neck, trunk flexed, anteriorly or posteriorly, hips and knees flexed. The patients were, when asked, able to correct these postured (if contractures had not occurred). Proprioception was intact. When blind- folded, the patients resumed the abnormal postures. The patients, when pushed or pulled fell. Purdon Martin attributed the falls to a loss of "righting reflexes." He thought these reflexes acted through the vestibular- spinal tracts which overcame the loss of tone resulting from the loss of postural fixation. He thought so because the patients who fell resembled patients who had bilateral vestibular loss and were blind- folded. His observations of finger- displacement, a template for postural fixation is described below:

By far the most common disorder seen unilaterally or bilaterally in 69 patients is a failure to maintain posture of the arm to perform a simple action with the hand when the patient closes his eyes. If the patient is asked to touch alternately the tips of the examiner's fore-fingers held... at the level of the patient's shoulder...he may continue to perform the movement quite well for several minutes, but if... he closes his eyes his hand almost immediately falls away...There is no evidence that the failure is due to disorder of the sense of position...The observation shows that vision plays a part in postural fixation of the upper limb...In cases of cerebellar disease there is an impairment of postural fixation which permits the limb to sway during a movement but closing the eyes does not aggravate these faults and does not cause the limb to fall away.

We write the letter to emphasize that an observation similar to ours was made 50 years ago by Purdon Martin (he wrote the monograph in 1964) although we were unaware of it until recently. Purdon Martin's emphasis on the role of the vestibular complex in PD, in the absence of tradition symptoms and signs of vestibular disease: nystagmus, vertigo, should be re- evaluated.

Bibliography

1. Lieberman A., *et al.* "Distinguishing the tremor of Parkinson's disease from essential tremor: finger displacement". *International Journal of Neuroscience* 124.3 (2014):175-180.
2. Lieberman A., *et al.* "Finger displacement in Parkinson disease: up? Down? Sideways?" *International Journal of Neuroscience* 124.3 (2014): 339-343.
3. Martin JP MD FRCP (London). "The Basal Ganglia and Posture, London", Pitman Medical Publishing Co. LTD (1967): 1-152.

Volume 2 Issue 5 December 2015

© All rights are reserved by Abraham Lieberman., *et al.*