



## Vestibular function in panic disorder patients: a vestibular-evoked myogenic potentials and video head impulse test study

G. Angov<sup>1</sup> · E. Mihaylova-Angelova<sup>2</sup> · D. Petrova<sup>3</sup> · Katerina Stambolieva<sup>4</sup>

Received: 20 January 2019 / Accepted: 18 March 2019  
© Springer-Verlag GmbH Germany, part of Springer Nature 2019

### Abstract

**Purpose** To evaluate the function of the utricle and saccule and their central connections by ocular and cervical vestibular-evoked myogenic potentials (oVEMPs and cVEMPs), and the function of high-frequency VOR of the semicircular canals by video head impulse test (vHIT) in patients with panic disorder (PD).

**Methods** Forty-eight patients with PD (21 with agoraphobia) and 20 sex- and age-matched healthy controls took part in the investigation. The vestibulo-ocular reflex (VOR) gains and latencies and peak-to-peak amplitudes of sound-induced VEMPs were measured and compared with those of healthy controls.

**Results** Any statistical differences in the parameters of cVEMP and oVEMP responses between both PD patients groups and between patients and healthy controls were not observed. Also, significant differences between VOR in patients and healthy controls were not found. The VOR gain, bilaterally in the three semicircular canals was within normal limits (0.8–1.2) for 67%, and higher for 33% of the patients with PD. Overt and covert saccades were not observed. The relationship between higher VOR gains and the increase of postural instability when a sensory conflict exists (standing on foam pad with eyes closed) for patients with PD was established.

**Conclusion** The VEMPs and vHIT tests demonstrated that there is no evidence of hypofunction of the semicircular canals in the high-frequency spectrum of VOR functioning. Nor are there any indications of impairment of the otolith system in patients with PD, regardless of their subjective vestibular sensations. The findings of the current study confirm the proposed link between anxiety, panic symptoms and postural instability in PD patients.

**Keywords** Panic disorder · Vestibular-evoked myogenic potentials (VEMPs) · Video head impulse test (vHIT) · Dizziness · Vestibular disturbance