

## Gait analysis may distinguish iatrogenic from neurodegenerative parkinsonism: a pilot study

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*Introduction:* Drug-induced parkinsonism (DIP) may be clinically indistinguishable from degenerative parkinsonism. Instrumental diagnostic tools, such as the <sup>123</sup>Ioflupane dopamine transporter (DaT) single-photon emission computer tomography (SPECT), are not always supportive in recognizing its etiology, since a number of drugs may interfere with DaT binding, affecting interpretation of results.

*Objectives:* The aim of our study is to find whether gait analysis may reveal typical patterns associated to iatrogenic parkinsonism compared to neurodegenerative parkinsonism (Parkinson Disease, PD).

*Methods:* Gait analysis is a 3D, computerized and non-invasive exam of walk; by elaborating signals obtained through a BTS Bioengineering system, spatial and temporal parameters of gait were computed and then analysed through a nonparametric statistical Mann Whitney test. We collected data from PD patients and patients affected by Bipolar Disorder (BD) with iatrogenic extrapyramidal signs. Each patient performed a normal gait task, a motor dual task and a cognitive dual task.

*Results:* Data were obtained from 8 BD and 8 PD patients, matched for age, sex, motor symptom duration and MDS-UPDRSIII scores. Parameters obtained during the normal gait task showed p-values almost significant in distinguishing PD and BD patients. Similarly, in the cognitive dual task, only step width showed a statistical significance difference between the two groups. Differently, in the motor dual task, stance phase, swing phase, mean velocity, cycle length, step length and step width showed a statistically significant difference (p-values <0.05) between PD and BD.

*Conclusions:* Gait analysis may reveal typical patterns associated with iatrogenic parkinsonism compared to neurodegeneration. Future perspectives include the comparison with a population of drug-exposed patients with concomitant neurodegeneration, in order to elucidate the relative contribution of the pharmacological treatment and the underlying conditions on the observed trends.