

Biodanza[®] effects on Parkinsonian patients' functionality

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Introduction

Patients suffering from Parkinson's disease (PD), a neurodegenerative disease affecting substantia nigra dopaminergic neurons, experience motor and non-motor symptoms. The former classically consist in tremor, bradykinesia and rigidity, usually associated with postural instability and functional impairment in handwriting, walking, and sometimes speaking and swallowing. The latter encompass anxiety, depression, cognitive deficits, sleep disorders, autonomic derangements, and olfactory dysfunction.

Drugs and/or surgical approaches sometimes are not so effective; rehabilitation is an useful add-on treatment for functional impairment. Nonetheless, other alternative/complementary therapeutic options are needed.

Biodanza[®] (Rolando Toro's System - s. in Toro, 2007) may represent a tool for stimulating re-appropriation and re-legitimacy of emotions in those doing it, particularly in persons – like PD patients – who experience an affective coarctation. Biodanza[®] uses dance, music and group interactions to enhance self-esteem, vitality and joy; to strengthen the identity and promote communication (Vannini, 2012). During a Biodanza[®] session, persons are moved by a strong emotional motivation: their movements come from *inside*. Being involved in a group activity is a challenge which stimulates to perform complex adaptive movements and gestures with a relational meaning (Vannini & Bongioanni, 2012).

Subjects & Methods

We studied 15 subjects (6 men and 9 women) suffering from PD (mean age \pm SD: 74 \pm 6 yrs) of moderate severity (Hoehn-Yahr: 3 \pm 1). Patients and caregivers attended 20 weekly sessions of Biodanza[®].

At the beginning (T_i) and at the end (T_f) of our introductory Course to Biodanza[®], patients underwent a neurological examination, a clinimetric assessment by a physiotherapist and a psychological interview. We used the *Unified Parkinson's Disease Rating Scale (UPDRS) - Section I, II and III* – to evaluate cognitive and motor impairments; the *Beck Depression Inventory (BDI)* for mood assessment; and the *Short Form-36 (SF-36)*, a questionnaire for health-related quality of life – both for somatic (*Physical Component Score, PCS*) and psychic issues (*Mental Component Score, MCS*).

Results

We found lower UPDRS scores at T_f (Fig. 1) with significant differences (compared to T_i scores) in those from Sections II and III (mean values \pm SD: 16 ± 9 vs 18 ± 9 ($p < 0.05$) and 19 ± 10 vs 23 ± 12 ($p < 0.01$), respectively). Such findings mean that PD patients significantly improved in their physical impairments and in activities of their daily living.

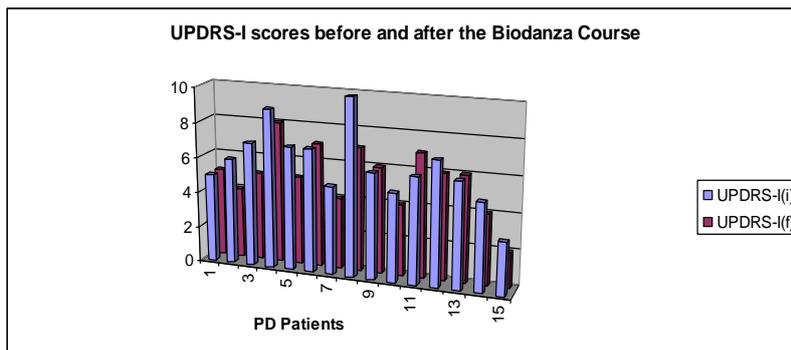


Fig. 1a. PD patients's scores at the UPDRS - Section I (before (i) vs after (f) Biodanza[®]).

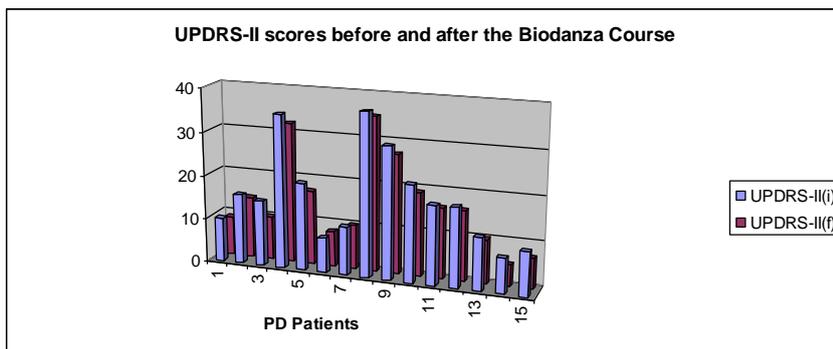


Fig. 1b. PD patients's scores at the UPDRS - Section II (before (i) vs after (f) Biodanza[®]).

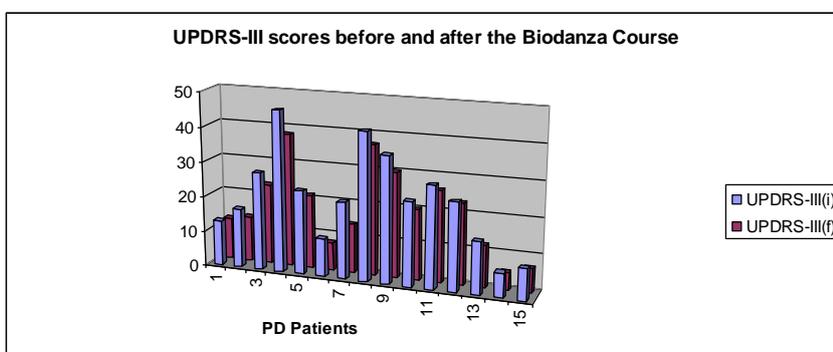


Fig. 1c. PD patients's scores at the UPDRS - Section III (before (i) vs after (f) Biodanza[®]).

Moreover, BDI scores (Fig. 2) were significantly ($p < 0.01$) decreased at T_f (mean values \pm SD: 14 ± 5 vs 21 ± 5), whereas SF-36 scores significantly increased (Fig. 3) - PCS: 44 ± 6 vs 39 ± 7 ($p < 0.05$); MCS: 46 ± 8 vs 40 ± 6 ($p < 0.01$). These data stand for a reduction of depression symptoms together with an improvement of patients' quality of life (for both physical and mental issues).

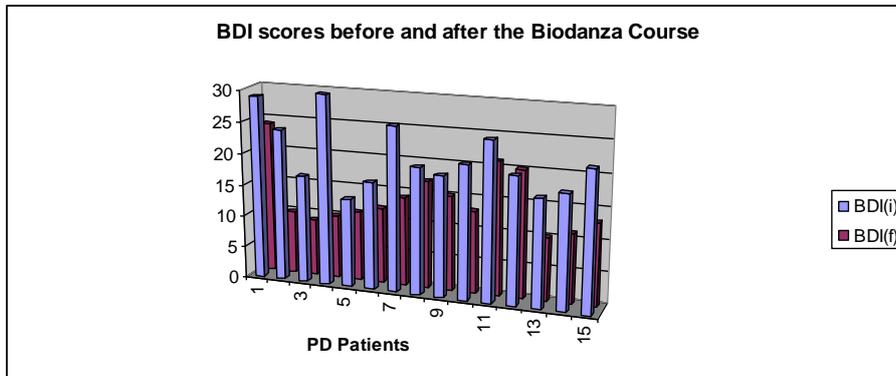


Fig. 2. PD patients' scores at the BDI (before (i) vs after (f) Biodanza[®]).

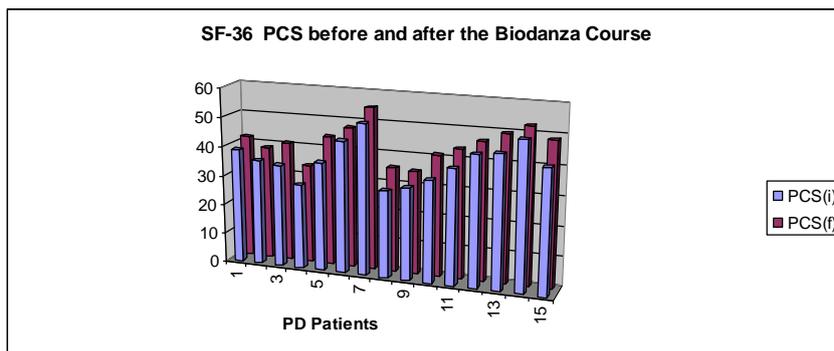


Fig. 3a. PD patients' Physical Component scores at the SF-36 (before (i) vs after (f) Biodanza[®]).

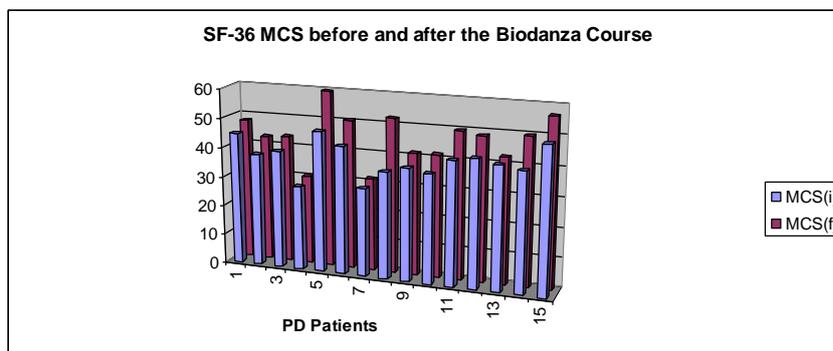


Fig. 3b. PD patients' Mental Component scores at the SF-36 (before (i) vs after (f) Biodanza[®]).

Discussion

After 20 Biodanza[®] sessions, mood and emotional balance improved in 91% and 87% of patients, respectively; motor difficulties (gait instability, somatic stiffness, tremor) in the activities of daily living were reduced in 62% of PD patients.

Action observation and imitation play a key role in dancing: several studies have reported activation of the human “mirror neuron” system in dancing, in particular when the person had learned or executed the movements previously (Calvo-Merino et al., 2006; Cross et al., 2009; Grafton and Cross, 2008).

Another important aspect of dance is its esthetics: the “mirror neuron” system is particularly activated when movements are perceived as esthetical (Calvo-Merino et al., 2008).

In PD patients it is known that auditory cues have an important impact on the motor system, increasing gait initiation, walking speed, and cadence and also reducing the severity of “freezing”: the auditory cues may bypass the dysfunctional loop from basal ganglia to the supplementary motor area (Dibble et al., 2004; Howe et al., 2003; McIntosh et al., 1997; Nieuwboer et al., 1997, 2007).

Biodanza[®] may, therefore, represent an enriched environment known to induce an increase of neurotrophic factors which promote brain plasticity (Kattenstroth et al., 2010).

Moreover, increased serotonin levels by dancing could act on serotonin receptors and have beneficial effect on PD patients’s mood.

Although still preliminary and concerning few subjects, our clinical data show that Biodanza[®] can make the PD patients have a better body awareness and feel better.

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