

Rehabilitation and Parkinson's Disease: A Happy Marriage!

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Parkinson disease is a neurodegenerative disorder with a high incidence among individuals aged 60 years and over. Although the pharmacological treatment has changed the natural course of disease, Parkinsonian patients have a low quality of life [1]. Hence, the need to develop rehabilitation treatments that can improve some symptoms: gait, balance, posture and autonomy in daily life activities.

The first important paper on this issue has been written by Comella and coll. : they showed a significant improvement on Unified Parkinson Disease Rating Scale total score after a month of rehabilitation treatment [2]. In the same year, Morris and coll. showed that gait dysfunction in Parkinsonian patients can be counteracted using visual or auditory cues [3,4]. These papers can be considered the basis on which new rehabilitation strategies for Parkinsonian patients have been developed. In fact, several studies were planned in order to evaluate the efficacy of this strategy on gait parameters and on freezing of gait. The most important study in this field is the RESCUE trial that showed a significant effect of cueing training on gait, freezing and balance, with a rapid declining in effectiveness at 6-week follow-up. This fact may be partially due to the non-homogeneity of the experimental group: patients with a great variability of age (41-80 years) and stage of disease (1 to 4 Hoehn-Yahr) [5]. In any case, it is clear that the use of cues alone is insufficient to obtain results which can be maintained over time.

At the beginning of new millennium, Miyai et al. used treadmill on Parkinsonian patients with freezing of gait and they found an improvement of gait parameters with the maintaining of beneficial effect for 4 months [6,7]. These data were confirmed by several authors and have received a final approval in a review by Mehrholz published on Cochrane library [8-12].

Moreover Fisher and coll. showed that treadmill improved gait parameters and also corticomotor excitability evaluated studying cortical silent period after transcranial stimulation [11]. This result is in agreement with a large literature on Parkinsonian animal models that show as an intensive use of treadmill lead to significant motor improvement related to a neuroplastic activity mediated by different growth factor [13-15].

The importance of the treatment intensity in Parkinsonian patients has recently been stated by Hirsch and Farley in an important paper in which they highlighted the most important studies in this field and invite the operators to encourage the patients to begin exercise training programs with an high training intensity, "beyond what they may self-select" [16]. Another important item in order to achieve better results is the multidisciplinary approach [17]. A recent paper in which a multidisciplinary intensive treatment was evaluated on Parkinsonian patients in medium stage of disease has showed a disease modified activity in comparison with patients treated only with drugs [18].

In conclusion we can say that between Parkinson's disease and rehabilitation it was celebrated in these last 20 years a happy marriage: the rehabilitation has shown a progressive relevant role in the treatment of Parkinsonian patients. We started by simple exercises and through cues and treadmill we came to develop multidisciplinary treatments that can change the quality of life and the course of disease.

New study, however, will be necessary to understand the

mechanism underlying these beneficial effects and to better define and promote the best rehabilitative treatment.

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