

Parkinson's disease: new system to improve quality of life

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Parkinson's disease (PD) is the most common neurodegenerative movement disorder, affecting 0.3% of the general population(1). Postural instability is a loss of balance and it is a common feature of PD(2). Individuals with PD commonly experience gait and postural stability impairments, which may lead to falls, mobility loss, and reduced independence. Human Body Posturizer (HBP) is a fully articulated orthosis, light and able to adapt to the physical characteristics of each individual. Our aim has been to evaluate the role of HBP as an innovative tool for the conservative treatment of gait and postural stability impairments in patients affected by PD. This study analyzed 20 subjects (10 male and 10 female) affected by PD and a control group of age-matched healthy subjects (10 male and 10 female). A bipodal platform (Prokin, TecnoBody) was used to evaluate static balance. To describe the functional characteristics of the PD sample, a clinical assessment was carried out at the beginning of the study. The Berg Balance Scale and the Parkinson's Disease Rating Scale (UPDRS) were administered before the experimental session. All patients were firstly evaluated without HBP and wearing normal clothes; then, patients were asked to wear HBP and, after 40 mins, a second acquisition with HBP was performed. For the static evaluation, the patients performed a stabilometric test, 30 sec with eyes open and then 30 sec with eyes closed; perimeter sway, area of the center of pressure (CoP), anterior-posterior velocity (V_{A-P}), and medial-lateral velocity (V_{M-L}) have been evaluated. Our results showed a marked improvement of all analyzed parameters; in particular, a significant reduction in V_{A-P} ($p < 0.05$) was present when patients wear HBP in both open and closed eyes. Moreover, a significant reduction ($p < 0.05$) of the CoP area was observed in closed eyes. This variable reflects the ability of balance system to achieve body stability. In conclusion, our data suggest a stabilizing effect of HBP in patients with PD with a role in improving quality of life.

References:

- [1] L.M.L. de Lau and M. M. B. Breteler "Epidemiology of Parkinson's disease" *Lancet. Neurol.*, vol. 5, no. 6, pp. 525–35, Jun. 2006.
- [2] A.L. Adkin, J. S. Frank, and M. S. Jog, "Fear of falling and postural control in Parkinson's disease" *Mov. Disord.*, vol. 18, no. 5, pp. 496–502, May 2003.

Keywords

Parkinson's disease, Esoskeleton, Human Body Posturizer.