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Hydrotherapy improves balance and posture Parkinson's disease patients.

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Abstract

Introduction

Hydrotherapy has been recently demonstrated to be helpful for treating Parkinson's motor symptoms [1]. In particular, water environment can allow early active mobilization, help strengthen muscles and limbs, relax and get pain relief, reduce the fear of falling, and relieve pain naturally.

The aim of this study was to assess the effect of hydrotherapy on both balance and posture in Parkinson disease patients (PDP).

Methods

Nineteen PDP and 10 controls were recruited. PDP (H&Y<3) were divided in 2 groups: groupA composed by 10 patients (age 64.4 ± 8.8 years, BMI 26.8±4.2) was engaged in 10 hydrotherapy sessions; groupB including 9 patients (age 67.4±8.1 years, BMI 25,9±4,2) performed 10 sessions of out-of-water therapy (OW). GroupC included 10 healthy persons (age 69.4±8.2 years; BMI 27.3±2.24) who did not perform any physical training. All subjects underwent balance, spine alignment and mobility assessment, pre and post therapy.

OW data were acquired with a stereophotogrammetric system and a force plate (BTS Srl) while underwater data were recorded with 4 GoPro cameras (30Hz).

Balance assessment consisted in acquiring the subjects while standing in upright position with the eyes open and closed for 60 seconds, respectively. Underwater 3D balance assessment was performed as in [2] while in OW the center of pressure displacement was recorded through a force plate. Balance assessment was performed by extracting the center of pressure spatio-temporal parameters [3].

The spine mobility assessment in OW conditions consisted in acquiring the subjects while performing 3 maximal flexion-extension tasks on both sagittal and coronal planes. Spine vertebras 3D motion was reconstructed through a motion analysis protocol [4] and maximum excursions calculated.

The following clinical scales were administered to the PDP: BBS, PDQ-39, UPDRS. T-Test and 1-way Anova ($p<0.05$) were used for comparing data across groups and between pre and post therapy.

Results

Significant improvements were observed on both spine maximum excursions and alignement on groupA in agreement with UPDRSIII results (fig.1-top). Balance improvements were also observed on the same group of subjects in each condition (fig1-bottom).

Discussion

Results of both clinical and instrumental analysis showed a greater efficacy of hydrotherapy compared to the OW therapy. The underwater environment appears to be a safer, proprioceptive and ideal environment for the body postural awareness. Future developments will include a longer follow up in order to define the hydrotherapy effects duration and the necessary frequency over the year.

References

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