

EVALUATION OF A POSTURAL REHABILITATION PROGRAM ON STRESS URINARY INCONTINENCE WITH THE VIRTUAL-REALITY GAME WII® FIT.

Hypothesis / aims of study

This is the first pilot study that is conducted to assess the effect of a supervised rehabilitation program with the Wii Balance Board (WBB) on the evolution of urinary symptoms, quality of life (QoL) and discomfort in activities of daily life (ADL), in stress urinary incontinent (SUI) women.

Study design, materials and methods

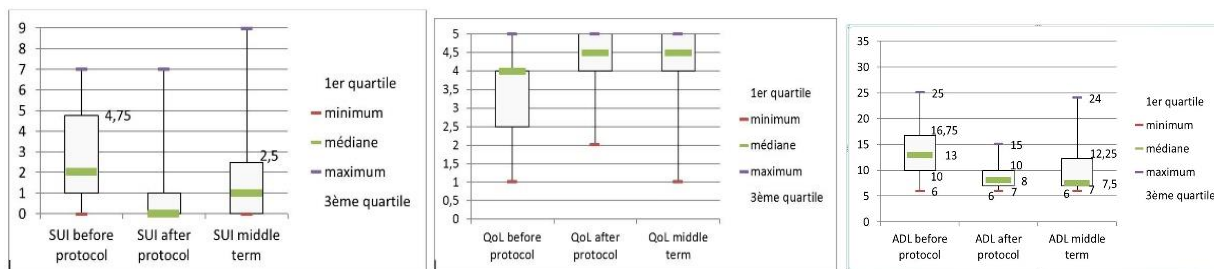
18 women with SUI received a supervised rehabilitation program with the postural control activity program proposed by the Wii Fit Plus ® software. All subject filled out a free and informed consent for biomedical research according the French Code for public health.

Evaluation: We used urinary symptom profile questionnaire and the French quality of life contilife questionnaire in addition to one visual analog scale evaluation for the patient global impression. The questionnaires were collected before starting the protocol and immediately after the last session of the protocol. Finally, a telephone questionnaire was administered to patients at 6 and 24 months after the start of the protocol.

Rehabilitation program: After initial assessment and examination including testing of the pelvic floor muscle (PFM), information about their pathologies was given. Our protocol consisted of 9 sessions, twice a week, of 40 minutes of 12 supervised exercises with Wii Fit Plus® virtual-reality game program.

Results

The SUI components were significantly reduced from the beginning to the end of the protocol ($p = 0.0005$). We observed an improvement in QoL of patients ($p = 0.0001$), the emotional impact of incontinence ($p = 0.0003$) and discomfort in ADL ($p < 0.0001$).



Interpretation of results

Pollock defined Postural control as the ability to maintain, restore or achieve a balanced situation in a posture or during an activity. Lack of postural control has been described as a factor influencing incontinence (1). In the Wii Fit Plus® video game software, the display of the centre of pressure, supervised by patient and therapist, informs about postural compensation and might help to a better awareness of postural defects leading to incontinence (2). This video game has been evaluated in various rehabilitations as improving postural control (3).

The Wii Fit Plus® software program can be considered as moderately intense physical activity. The benefit role of moderately intense physical activity on SUI (4) is highlighted by the review of J. Peterson. The software offers two types of exercises: Gymnastics or yoga exercises that allowed unconscious strengthening of the lumbo-pelvic stabilizer muscles (5), and games, which favoured the automation of learning. These feedback techniques are related to the field of rehabilitation. It's a gentle rehabilitation technique, accessible and understandable for most patients, using-concept as mirror image, bonus and quantitative motivation during the execution of the exercise protocol. This rehabilitation program is also a good way for therapists to induce change in the patient lifestyle and promote the benefit of moderately intense physical activities.

According to the Cochrane Herderschee & Hay-Smith 2013 review (6), biofeedback associated with isolated PFM training permits respective improvement rates of 86 % in SUI and only PFM training permits improvement rates of 76 %. These levels of improvement are relatively comparable to those of our study. Indeed, 73% of women in our study reported improvement or cure at 10 months with both a reduction of symptoms and improvement in quality of life, despite a brief management of 2 months only. Of the 15 patients who completed the questionnaire reevaluation in the medium term, 80 % had a global impression of improvement. At last, only one patient would not recommend this protocol, which makes a recommendation rate to a friend 93.3%. The technique must be supervised and controlled by the physiotherapist, but the therapist training time with his patient is not superior to conventional PFM training or PFM biofeedback therapist training time. This training program is interesting in term of cost and is easily accessible to our patients.

Concluding message

A supervised rehabilitation program with the postural control activity proposed by the Wii Fit Plus ® software can be a complementary technique in SUI rehabilitation program. We observed a decrease in SUI components ($p = 0.0005$), an improvement in QoL ($p = 0.0001$), of discomfort in ADL ($p < 0.0001$). Emotional impact of incontinence decreased ($p = 0.0003$). It would be

interesting to assess the value of this method on a larger population sample as a complementary way of rehabilitation for women's SUI, including pad test, or standardized cough test or voiding diary and objective postural control assessment.

References

1. Smith MD, Coppieters MW, Hodges PW. Is balance different in women with and without stress urinary incontinence? *Neurourol Urodyn.* 2008;27(1):71-8.
2. Steenstrup B, Giralte F, Bakker E, Grise P. Evaluation of the electromyography activity of pelvic floor muscle during postural exercises using virtual video games Wii Fit Plus©. *Analysis and perspectives in rehabilitation. Progrès en urologie.*2014 ; 24,1099-1105
3. Using the Wii Fit as a tool for balance assessment and neurorehabilitation: the first half decade of "Wii-search". D. J Goble, B. L Cone and B. W Fling. *Journal of NeuroEngineering and Rehabilitation* 2014, 11:12

Disclosures

Funding: none **Clinical Trial:** Yes **Public Registry:** No **RCT:** No **Subjects:** HUMAN **Ethics not Req'd:** This is a prospective pilot study. The goal is to obtain sufficient results to validate the protocol settings , refining the methodology and prepare a larger study. If the questionnaires were completed by patients prospectively , the analysis that was done has been delayed manner in time in relation to the care of patients. **Helsinki:** Yes **Informed Consent:** Yes