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HORSEBACK RIDING FITNESS MACHINE FOR THE TREATMENT OF STRESS URINARY INCONTINENCE – A PILOT STUDY

Hypothesis / aims of study

Horseback Riding Fitness Machine spontaneously induces muscle activity in many part of the human body by forcing users to maintain balance against titubation while in a seated position. This equipment strengthens core (trunk) muscles based on "Counter-Balance Exercise Technology" (1). Core muscles include the pelvic floor muscles. Therefore, exercising with this equipment has possible therapeutic effect on Stress Urinary Incontinence (SUI). Here we present data from our preliminary studies to investigate whether ordinary usage for fitness of Horseback Riding Fitness Machine improves SUI symptoms and patients' quality of life (QOL).

Study design, materials and methods

Between December 2009 and January 2010, ten consecutive SUI patients (mean age of 56.2 years, range 38-75) with no history of SUI treatment were recruited via the Internet. At baseline, following parameters were evaluated in all patients ; [1]Questionnaires ; International Consultation on Incontinence Questionnaire - Short Form (ICIQ-SF) and Incontinence Quality of Life (I-QOL), [2] 24 hour pad test, [3]The volume of levator ani muscle measured by MRI, [4]Urodynamic testing (Cystometory, Maximum Urethral Closure Pressure (MUCP), Uroflowmetry/Post-void residuals), [5] EMG of pelvic floor muscles(using FemiScan), [6]Body Mass Index (BMI). Before starting the training with the machine, all patients got adequate instructions for proper usage of the equipment and they started the training from February 2010. The equipment was set up at the patients' home, and they carried out training for 15 minutes a day, six times a week in a given program for 4 months. Subjects recorded the training conditions in a diary (training record). All parameters mentioned above ([1] – [5]) were evaluated again 4 months after training started. Statistical analyses were performed using t-test (Dunnett).

Results

At base line, all patients were diagnosed as having urodynamically proven SUI. None of them has detrusor overactivity. In evaluating the data, we confirmed that the subjects did not experience any adverse events from the training. [1]The total score of the I-QOL was improved significantly from 69.8±11.2 to 86.4±11.3 ($p<0.05$) after 4 months' training. In the ICIQ-SF, significant improvement was found in both domains "incidence of urinary frequency" (from 2.7±0.5 to 1.5±0.7) and "quantity of leakage" (from2.5±0.4 to 1.3±0.5), respectively ($p< 0.05$). There was also a significant difference in total sore of ICIQ-SF between pre- and post- training (from9.4±1.4 to 6.3±1.5, $p< 0.05$). [2] 24 hour pad test was improved significantly from 9.1±3.2 g to 2.9±0.9 g ($p<0.05$) after 4 months. [3] The volume of levator ani muscle measured by MRI increased slightly in 5 of the subjects, but unchanged in another 5 subjects over the 4 months. There was no clear tendency shown. [4].Urodynamic testing did not show any significant difference in any parameters studied. [5] Electromyography (EMG) of pelvic floor muscles indicated that the active maximum contraction of the pelvic floor muscle was improved in 6 subjects out of ten. [6] Significant decrease of BMI was found after the 4 months' training (from 25.9±4.2 to 21.3±3.8, $p<0.05$).

Interpretation of results

Although the underlying mechanism of improving SUI is not clear from this study, 4 months training with Horseback Riding Fitness Machine did improve both the urinary incontinence quality of life scale and pad testing data significantly. Since the significant association of obesity with stress urinary incontinence has been confirmed in many reports (2,3), the decrease of BMI by the training machine seems to be one the factors to reduce or ablate the symptoms associated with SUI. Furthermore, our EMG study suggests that this machine may strengthen the pelvic floor muscle contraction in some patients with SUI although the volume of levator ani muscles did not increase. The equipment was non-invasive and could be used as a home treatment. Further studies with larger subjects and longer follow-up are necessary to clarify the advantage of this machine.

Concluding message

It is generally said that pelvic floor muscle training is difficult for patients to maintain due to its monotonous and tiring nature. This is especially true in the condition without a continence nurse or physiotherapist. Findings from the current study suggest that Horseback Riding Fitness Machine has the potential to be an alternative to pelvic floor muscle training for stress urinary incontinence.

References

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Is this a clinical trial?	**Yes**
Is this study registered in a public clinical trials registry?	**No**
Is this a Randomised Controlled Trial (RCT)?	**No**
What were the subjects in the study?	**HUMAN**

Was this study approved by an ethics committee?	**Yes**
Specify Name of Ethics Committee	**The Ethics Committee of the Yotsuya Medical Cube (Tokyo, Japan).**
Was the Declaration of Helsinki followed?	**Yes**
Was informed consent obtained from the patients?	**Yes**