

DOES WHOLE BODY VIBRATION TRAINING HELP IN A GERIATRIC POPULATION SUFFERING FROM URINARY INCONTINENCE?

Hypothesis / aims of study

Stress urinary incontinence (SUI) is a common health problem increasing in the elderly. Aging affects the urinary tract but additionally factors as changes in cognitive function, lifestyle and functional mobility can also contribute to UI (1). Pelvic floor muscle training (PFMT) is considered to be the first-line treatment in SUI, due to curing rate, non-invasive character, low risks and costs (2). Impaired cognitive function is a complaint among many older people, the memory processing is limited, influences normal daily activities, and is affecting treatment. WBVT is assumed to stimulate the muscle spindle and causes a tonic vibration reflex. There is some evidence that WBVT improves muscle performance and balance. WBVT is activating the pelvic floor muscles and induces higher muscle activity than during a MVC (3). Many inhabitants of nursing homes are incontinent, cognitively restricted and have physical declines. In relation to physical and cognitive declines, WBVT is a simple, not exhausting and cognitive realizable training with low risks in contrast to PFMT, what is beneficial but needs independent practice and implementation into daily life activities. The aim of this study was to investigate the influence of WBVT, with or without PFMT, on urinary leakage in a female geriatric population, compared to a control group receiving a placebo treatment.

Study design, materials and methods

This study with 49 women (mean age 83.6 years), presenting a predominantly persistent stress urinary incontinence for the past three months or more. The women were recruited from a nursing home and followed-up in a 14 weeks program. The participants were divided into 3 groups: [1] received three times-a-week training on a vibration platform (WBVT, no cognitive resources required), [2] WBVT in combination with PFMT (consisting vibration training and once-a-week physiotherapy sessions combined with home exercises, cognitive resources needed), and [3] control group receiving a placebo WBVT (off-set standing on a vibration platform, no cognitive resources required). Group allocation was based on cognition level at entry. Outcomes measures for severity of incontinence was calculated by the 3 days 24 hour pad test and compared at baseline, 7 and 14 weeks. Quality of life was measured by the German language KHQ. Statistical analyses were performed with SPSS 17.0, using t-tests for paired comparisons from baseline to 14 weeks with Bonferoni correction for multiple comparisons.

Results

44 women with SUI completed the program, mean age was 83.6 years, 5 participants dropped out (three in the control-, one in the WBVT + PFMT-, and one in the WBVT group) due to other health problems. There was a significant decrease in urinary leakage in the intervention group who received PFMT and WBVT ($p < 0.05$). The intervention group who received only WBVT showed a reduction in urinary leakage, especially in the first 7 weeks, but the result was not significant. There were no changes in the placebo group. Quality of life was improved in all the groups but only significant results were found in both intervention groups within the questions general health perception and sleep/energy ($p < 0.05$).

Table 1. Comparison of the groups between baseline and post-treatment (14 weeks)

group	mean	SD	95 % CI	p-value
BVT	40.541	126.509	-26.871 – 107.952	.219
WBVT + PFMT	46.352	29.961	-30.948 – 61.757	.000
control	.456	153.651	-102.769 – 103.680	.992

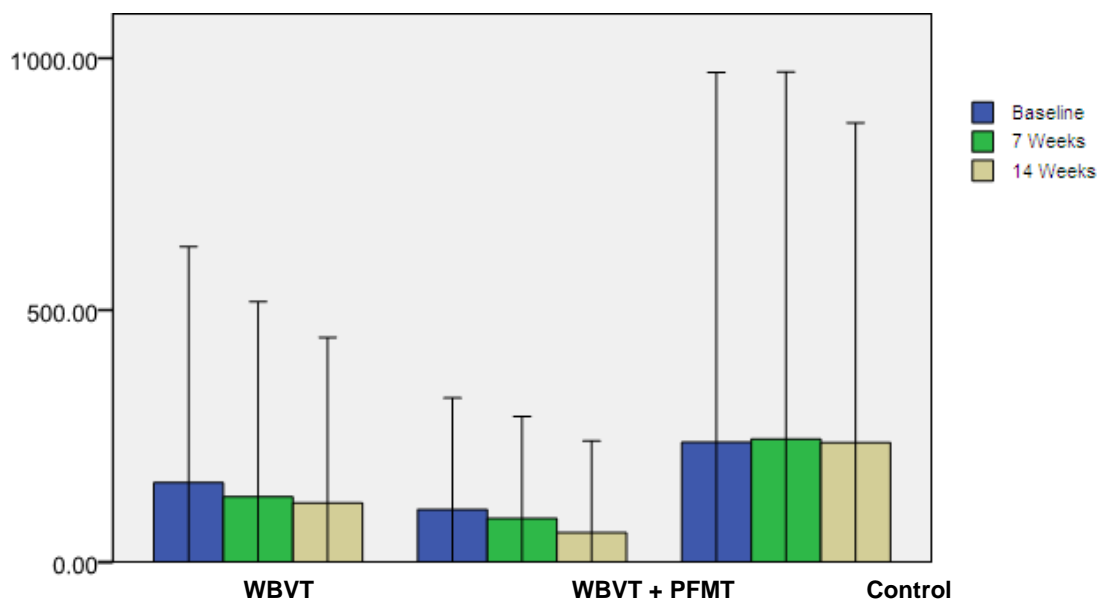


Fig. 1. Comparison of the groups between baseline and post-treatment

Interpretation of results

There was a small effect size (0.2) found in the WBVT group. The reduction of UI in this group can probably be attributed by the activated and neuromuscular adapted PFM, improving intra- and inter muscular activity. The outcome measures of the 24 hour pad test showed, after 7 weeks of training, a notable reduction in UI but after 14 weeks the reduction was not substantially augmented, possibly due to the already saturated neuromuscular adaptation that took place in the first 7 weeks. The experimental group, who received WBVT and PFMT, explicitly trained multiple pelvic floor muscle functions such as muscle power, endurance, performance and reflex activity. This resulted in a significant reduction in urinary leakage.

Concluding message

WBVT is a simple and feasible training; however the results of our study showed a small effect size (0.2), indicating that WBVT might be a useful treatment in impaired cognitive patients suffered by SUI. In patients who can realize PFM exercises the treatment combination of WBVT and PFMT is clearly more effective. Further studies should determine whether adaptations in frequency and/or intensity are able to enhance the training effects of isolated WBVT in cognitive impaired populations.

References

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<i>Is this a clinical trial?</i>	Yes
<i>Is this study registered in a public clinical trials registry?</i>	No
<i>Is this a Randomised Controlled Trial (RCT)?</i>	No
<i>What were the subjects in the study?</i>	HUMAN
<i>Was this study approved by an ethics committee?</i>	Yes
<i>Specify Name of Ethics Committee</i>	Kantonale Ethikkommission Bern
<i>Was the Declaration of Helsinki followed?</i>	Yes
<i>Was informed consent obtained from the patients?</i>	Yes