



A Novel Rehabilitative Strategy in the Treatment of Mixed Urinary Incontinence in Women: The Focused Mechano-Acoustic Vibration in Alliance with the Surgery

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Editorial

Female Urinary Incontinence (UI) can be treated successfully, often by combining multiple approaches as surgical therapy, pharmacological therapy and pelvic re-education as the three possible ways all well articulated within them [1]. Clinical practice guidelines recommend individualized pelvic floor muscle training as a first-line treatment for stress or mixed UI in women [2,3] and rehabilitation is a good ally for incontinence surgery in women both before and after surgical treatment, also in the light of innovative physical instrumental therapies such as the focused mechano-acoustic vibration. It may represent a novel rehabilitation strategy in alliance with surgery as necessary for strengthening pelvic muscles in mixed UI in women [4-6]. The main preliminary finding of our study respect of forty five (N=45) patients (mean age of 56.10 ± 3.27 years) with mixed UI were encouraging. The patients were divided into 2 groups: the treatment group by mechano-acoustic vibration (*Vibration Sound System*[®] - VISS) (TG) (N=23) and a waiting list group (CG) (N=22). The inclusion criteria were an age between 50 and 70 years old and a diagnosis of mixed UI defined by the International Continence Society (ICS) criteria and a Body Mass Index (BMI) <30. The exclusion criteria were: performing other therapeutic protocols and the presence of urogenital infections, the neurological pathologies, if pelvic organ prolapse, pain, aematuria, voiding symptoms, and spinal lesions of any grade. Women with prior anti-incontinence surgery or medical treatment for overactive bladder were excluded. The clinician (a specialist in gynecology) assessed the prevalent type of incontinence and its duration, moreover urine analysis and urine culture were analyzed. The physical exam included abdominal, pelvic and vaginal examination and a stress test.

This study was performed per the Helsinki Declaration on human experimentation and was approved by the Department Committee of G. D'Annunzio University of Chieti (Italy). All patients gave written informed consent after receiving detailed information on the study's aims and procedures. The experimental therapeutic protocol by VISS, consisting of 10 sessions, three times a week for the first two weeks and then, twice a week for the next two weeks thereafter. It consists of a 32,000-revolution turbine with a flow rate of 35 m³/h able to generate air waves with a pressure up to 250 mbar, and of a flow modulator which makes air vibrate with a pressure up to 630 mbar and a frequency up to 980 Hz. A frequency of 300 Hz for 15 min was used contemporary for every muscle treated by a physiotherapist expert in the treatment. Thus, a follow-up period of one month followed without treatment. Each patient underwent a treatment of focused mechano-acoustic vibration with applicators (bilaterally) placed at the level of: the rectus abdominis muscles, the adductor muscles (gracilis muscle, pectineus muscle, long adductor muscle and short adductor muscle), the gluteus maximus muscle, quadratus lumborum muscle and pelvic floor muscles. A two-way ANOVA for repeated measurements was calculated respect the evaluation scales and before carrying out parametric analysis descriptive statistics were used to describe the sample. Differences were evaluated for p-value <0.05.

The VISS group reported an improvement in urinary incontinence symptoms with an amelioration in their quality of life, for the Pelvic Floor Disability Index (from 78.23 ± 11.14 to 50.43 ± 18.12) and the Pelvic Floor Impact Questionnaire (from 111.82 ± 14.78 to 62.26 ± 11.54) that are statistically significant (P<0.01) and the change over the three evaluation time: at time T0,

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before beginning the protocol, and at time T1, after completing the rehabilitative protocol by VISS and at T2 (1 months-Follow-Up) [7,8].

The mechanism of action on the pelvic floor muscles and on the other muscles treated could be due to: a stimulation of mechano receptors and specifically the Pacinian corpuscles, which have the highest sensitivity (1 mm) at a frequency of 250-300 Hz as in our rehabilitative protocol, thus representing the vibration receptors for excellence and a muscle training up to 300 Hz of frequency. In this perspective, focused mechano-acoustic vibration acts as an exercise modality that improves the muscular frailty [9,10]. The mechanical focal vibration by VISS could be consider a good novel rehabilitative approach, not invasive for the rehabilitation of the pelvic floor muscles in the mixed UI in women in alliance with surgery.

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