

The Effect of an Educational/Behavioral Intervention on Urinary Inconsistence of Women with Multiple Sclerosis

Mohammad Eslami vaghar¹, Amir Mohammad Parandeh² and Seyed Mohammad Masoud Shushtarian^{3*}

¹Mohammad Eslami vaghar, Department of Gynecology, Faculty of Medicine, Tehran Medical Science, Islamic Azad University, Tehran, Iran

²Amir Mohammad Parandeh, Faculty of Medicine, Tehran Medical Science, Islamic Azad University, Tehran, Iran

³Seyed Mohammad Masoud Shushtarian, Department of Biophysics and Biochemistry Faculty of Advance Science and Technology, Tehran Medical Science, Islamic Azad University, Tehran, Iran

ABSTRACT

Introduction: Considering the high prevalence and importance of multiple sclerosis (MS) and its complications, especially urinary incontinence and the need to identify less complicated and effective treatment methods for it, this study aimed to investigate the effect of an educational intervention on urinary incontinence of women with MS.

Methods: In this semi-experimental study, 70 MS patients with urinary incontinence, who referred to the affiliated hospitals of Tehran Islamic Azad University 2021–2022, were included non-randomly. Two sessions of 45-minute pelvic floor muscle training, standard method of urination and regulation of fluid intake were provided to the patients. The urinary leakage before and after the intervention were evaluated using ICIQ-UI questionnaire and the results were compared using SPSS v.23.

Results: Comparing the post-intervention values with pre-intervention values showed significant decrease in mean frequency of urinary leakage (from 1.19 ± 0.89 to 2.90 ± 1.05 ; $p=0.012$), mean amount of urinary leakage (from 4.20 ± 1.49 to 1.49 ± 1.23 ; $p=0.003$), and the impact of urinary leakage on the quality of life (from 2.82 ± 0.92 to 1.01 ± 0.75 ; $p=0.012$).

Conclusion: The educational/behavioral training had a significant effect on urinary control of women with MS and reduced the impact of UI on their QOL; therefore, this method is suggested as an effective, easily applicable, and available tool to be implemented for treatment of urinary incontinence in women with MS.

*Corresponding author

Seyed Mohammad Masoud Shushtarian, Department of Biophysics and Biochemistry Faculty of Advance Science and Technology, Tehran Medical Science, Islamic Azad University, Tehran, Iran.

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Introduction

Multiple sclerosis (MS) is the most common demyelinating disease, with a variable prevalence, ranging from 100:100,000 in North America and Europe to 2:100,000 in Eastern Asia and sub-Saharan Africa [1]. This chronic, immune-mediated disease of the central nervous system (CNS) mainly affects young adults (15–50 years of age) and the progressive neurodegeneration can lead to severe physical or cognitive disability and neurological defects [2,3].

Bladder dysfunction presents in more than 80% of patients with MS, as a part of the neurogenic bladder or lower urinary tract dysfunction, mainly in primary stages, which can progress to urinary incontinence (UI) in some patients due to fatigue and uncoordinated muscle recruitment; the failure to store urine

embarrasses the patient in the society, making her/him withdraw from social activities, impairs the patient's well-being, and reduces their quality of life (QOL) [4,5]. UI, defined by the International Urinary Incontinence Association as involuntary leakage of urine, categorized into urge, stress, and overflow (or mixed) incontinence, is common among adult females (17–41%), caused by the bladder neck hypermobility and urethral sphincter deficiency; obesity, pregnancy, pelvic prolapse, and gynecological surgeries are the risk factors in the general population [6]. In patients with MS, a frequency of about 30% has been reported for stress urinary incontinence, more common in older patients with a higher body mass index (BMI) and relapsing-remitting MS type, possibly due to the higher frequency of detrusor sphincter dyssynergia in this type [7].

Medications like anticholinergic agents, desmopressin, and cannabinoids, have been suggested for the treatment of UI in patients with MS; however, each are associated with adverse

events [8]. Therefore, search has been attracted to alternative methods and several methods have been suggested. Considering the role of pelvic floor muscles in UI, kinesiotherapy/physiotherapy, and/or surface electrical stimulation have been suggested as effective rehabilitation methods for improvement of UI symptoms in cases with MS [9]. But these therapies are not always available. Therefore, behavioral therapy and pelvic floor muscle training (PFMT) have been suggested as additional strategies recent research indicated the efficacy of PFMT alone, as well [10].

Considering the high prevalence of UI in patients with MS and its impact on QOL, it is important to design a therapeutic strategy to reduce its frequency/volume, as well as its impact on QOL. Educational/behavioral therapies are easily accessible methods that can be applied at all medical centers. In the present study, we aimed to investigate the effect of an educational/behavioral intervention on urinary incontinence of women with MS.

Materials and Methods

In this semi-experimental study, women, who referred to the affiliated hospitals of Tehran Islamic Azad University 2021–2022, were considered as the study population and included into the study. The study protocol was approved by the Ethics Committee of Tehran Islamic Azad University. The inclusion criteria consisted of age of 18–50 years, diagnosis of MS confirmed by a neurologist, EDSS score <6 (based on the neurologist's diagnosis), no MS attack during the past three months, no change in the dose or type of medical treatment for urinary incontinence during the past one month, no urinary infection, diabetes mellitus, or history of gynecologic surgery, not using exercise treatments for urinary incontinence. The sample size was calculated at 70, based on G-power software, considering 95% confidence interval and values from previous studies the eligible patients were enrolled into the study by convenient sampling method, after they received explanation about the study protocol and signed the written informed consent.

The clinical characteristics, including type of MS disease (relapsing-remitting or progressive) and the duration of disease (in years), were collected and recorded in the study's checklist. The patient's weight and height were recorded and for each patient, body mass index (BMI) was calculated and recorded in the study's checklist. Patients with a BMI of 18.5–24.9 kg/m² were considered as normal, 25–29.9 kg/m² as overweight, and ≥30 kg/m² as obese. Then, each patient was placed in a quiet room with appropriate room conditions. First the researcher explained to the patients how they should complete the questionnaire; then, asked them to complete the International Consultation on Incontinence Questionnaire–Urinary Incontinence (ICIQ–UI). During completing the questionnaire, the researcher stayed by the patient to answer any questions they had about the questions. The short form of this questionnaire contains 5 questions; the first and second questions ask about the patient's age and sex and the third question asks the frequency of urinary leakage and using

pads. The fifth question evaluates the effect of urinary leakage on the patient's QOL. The patients were asked to complete this questionnaire once before and then after the intervention.

The intervention consisted of 2 educational sessions, provided to the patients by a resident, educated for this purpose; each session lasted for 45 minutes. During each session, PFMT, standard method of urination and regulation of fluid intake were provided to the patients. The PFMT included contracting the pelvic floor, holding for 6–8 seconds and 3–4 rapid contractions. After the end of intervention, the patients completed the questionnaire again and the before–after results were compared. Any missing data was completed by phone calls.

Statistical Analysis

Data was analyzed using the IBM SPSS Statistics for Windows, Version 23.0 (Released 2014. Armonk, NY: IBM Corp). Descriptive results by frequency (percentage). For numeric variables, Shapiro–Wilk test was used to determine the normal distribution of data and accordingly, the results were presented as mean ± standard deviation (SD) or median with 95% central range. For comparing the quantitative variables between the groups, t test or Mann–Whitney U test was used, according to the results of normal distribution. Chi square test was used for comparing categorical variables. The significance level was 0.05 in all tests.

Results

A total of 70 patients completed the study, the mean age of participants was 34.07±4.58 years (26–42 years); the majority (74.3%) were 30–59 years. Most patients had overweight (84.3%), while only 10% had normal BMI and 5.7% were obese. Type of MS disease was relapsing-remitting in 75.6%; the rest were secondary progressive; most had the disease for 7–13 years (57.1) and 34.3% had the disease for ≤6 years, only 7.1% had the disease for 14–30 years and only one patient for more than 30 years.

Comparing the frequency of urinary leakage before and after the intervention, shown in table 1, a significant difference was observed in the categories; as shown in the table, before the intervention 8.6% of patients always had urinary incontinence and the majority (37%) had at least once a day; none reported no incontinence. But, after the intervention 27.1% had no incontinence, and none had it for several times a day or always. Also mean urinary leakage decreased significantly, from 1.19±0.89 before intervention to 2.90±1.05; p=0.012.

Considering the amount of urine, before intervention 14.3% reported high amount, which changed to 0 after the intervention; instead, the 4.3% of patients with none increased to 34.3% (table 1). Also, mean amount of urinary leakage decreased from 4.20±1.49 before intervention to 1.49±1.23 after the intervention; P=0.003. These results show that the severity of incontinence decreased after the intervention.

Table 1

Variable	Categories	Time		P-value*
		Before Intervention	After Intervention	
Frequency of Urinary Leakage, N(%)	Never	0	19(27.1)	0.012
	Once a week	5(7.1)	22(31.4)	
	2-3 time a week	21(30)	26(37.1)	
	Once a day	26(37.1)	3(4.3)	
	Several times a day	12(17.1)	0	
	Always	6(8.6)	0	
Amount of Urinary Incontinence, N(%)	None	3(4.3)	24(34.3)	0.003
	Low	7(10)	40(57.1)	
	Moderate	43(61.4)	6(8.6)	
	High	17(14.3)	0	
Effect on Quality of life	None	0	18(25.7)	0.012
	Mild	0	34(48.6)	
	Moderate	35(50)	17(24.3)	
	High	10(14.3)	1(1.4)	
	Extremely high	25(35.7)	0	

The results of chi Square Test, The Result of Independent Samples t Test

Considering the impact of urinary leakage on the quality of life, as shown in table 1, none of the patients reported it none or mild before intervention, while after the intervention 25.7% reported it as none and 48.6% as mild. Also the 35.7% of patients reporting the effect as extremely high changed to none in this category after the intervention. Mean value also decreased from 2.82 ± 0.92 to 1.01 ± 0.75 ($p=0.012$).

Discussion

The present study showed the significant effect of the educational/behavioral therapy on reducing the frequency and volume of UI and its impact on QOL of women with MS. Bearing in mind the fact that this therapy was provided to the patients in two sessions, each for 45 minutes, this treatment is suggested as an easily applicable method for this complication. Considering the significance of UI in patients with MS, several studies have addressed the efficacy of different therapeutic methods; some have investigated UI factors only, while few have addressed its effect on QOL, as well; each have used a different questionnaire.

In a similar study in Brazil, Lucio and colleagues randomized 35 patients to receive 12 weeks of PFMT with assistance from a vaginal perinometer and instructions to exercise daily at home, compared with a sham group and the results showed fewer storage and voiding symptoms in the treatment group with significant improvement in the scores of overactive bladder questionnaire, ICIQ-short form, general QOL, and Specific Impact of Urinary Problems of the Qualiveen questionnaire. This study concluded that PFMT improves UI symptoms of women with MS with a positive effect on QOL (10). Also, in another study, 12 weeks of PFMT to 72 patients with relapsing-remitting MS resulted in increased maximum bladder volume and decreased ICIQ-SF and Beck Depression Inventory [11]. These results are in line with that of the present study, although the duration of intervention was much shorter. In another study, the effect of 12-week PFMT was compared between the two groups with and without physiotherapist guidance and the results showed significant reduction in number of leakages, compared to baseline, while the two groups were similar; however, only the group with guidance

showed a significant effect on QOL [12]. Also, in the present study, the educational program was provided in-person to the patients and was guided, like that in this study. This is while a recent RCT showed the efficacy of tele-training of PFMT, performed 2 sessions per week under the supervision of a physiotherapist, in patients with MS; as reported, both tele-training and home training improved the leakage episodes and pad usage [13]. Importantly, the training should be friendly, so that the patient complies with it and performs the exercises. The effective results in our study showed that the patient had performed the suggested protocols. Urodynamic studies have shown increased cystometric capacity and reflex volume by PFMT that resulted in improved power, endurance, repetitions, and contraction time, as much as intravaginal electrostimulation (8). Also, the specific exercise for bladder rehabilitation had significant effect on voided volume and ICIS-SF [14,15].

Few studies have addressed UI in Iranian patients with MS; to be comparable to the present study. In the study by Ghasemi et al, the efficacy of Swiss Ball and biofeedback was compared on 42 patients with MS from Isfahan City, the results of which showed the efficacy of both treatment methods on UI and QOL [16]. Another study in Tehran investigated the effect of PFMT on UI of 50 patients with MS, admitted to Imam Khomeini Hospital, and investigated the effect of three months of treatment with PFMT. The results showed significant reduction in the frequency of urinary leakage and leakage volume and improved the QOL, evaluated by ICIQ-SF [17]. These results are consistent with the results of the present study, indicating a significant effect for training PFMT to patients with MS; however, the intervention we applied was very short (only two sessions, each for 45 minutes).

In the present study, in addition to the PFMT, we educated the women about urination method and regulation of fluid intake, as additional methods for PFMT. The results of the present study showed that the education provided for the behavioral change was significantly effective; but, we cannot separate the effect of each intervention, as we have considered their combination. In another study on 200 patients with MS, the mean total daily fluid

intake was 2.5mL, not associated with the severity of lower urinary tract symptoms in these patients; even patients who reported restricting fluid were more likely to have worse urinary symptoms (OR=1.95); therefore, this study concluded that restricting fluid intake is not an appropriate guidance in patients with MS [18]. Study on individuals without MS also showed no association between fluid intake and UI [19].

The strengths of the present study include investigating the effect of an easily-accessible training method that can be applied in any environment without the need for any equipment for one of the important complications of a prevalent medical condition, MS. However, this study had some limitations. Firstly, we included patients from few hospitals of one city in a non-random method. Therefore, the study population may not be representative of the whole population. Secondly, we compared the post-intervention results with pre-intervention values of one group and did not have a control or sham group in the study, to compare the results with placebo, no intervention or another intervention. Thirdly, our results was based on the patients' reports and is thus exposed to subjective error.

Conclusion

The two weeks of educational/behavioral training had a significant effect on urinary control of women with MS and reduced the impact of UI on their QOL; therefore, this method is suggested as an effective, easily applicable, and available tool to be implemented for treatment of UI in women with MS.

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