COMPARISON OF THE EFFECTS OF PARASACRAL TRANSCUTANEOUS ELECTRICAL NERVE STIMULATION PROTOCOLS IN WOMEN WITH OVERACTIVE BLADDER (Open Discussion ePosters 555)

Zehra Korkut[1], Merve Basol Goksuluk[2], Arif Aydın[3], Seyda Toprak Celenay[4]

[1]Asst. Prof., Selcuk University, Faculty of Health Sciences, Department of Physiotherapy and Rehabilitation, Konya, Turkey.

[2] Phd., Erciyes University, Faculty of Medicine, Department of Biostatistics, Kayseri, Turkey.

[3]Assoc. Prof., Necmettin Erbakan University, Meram Medicine Faculty, Department of Urology, Konya, Turkey

[4]Assoc. Prof., Ankara Yildirim Beyazit University, Faculty of Health Sciences, Department of Physiotherapy and Rehabilitation, Ankara, Turkey.

Hypothesis / aims of study

Overactive bladder (OAB) was defined as ‘urgency, with or without urge incontinence, usually with frequency and nocturia’ by the International Continence Association. The prevalence of OAB can be up to 50% in women and it is known to increase with age. OAB may not be a direct danger to patients' lives, but it is a significant public health concern that greatly impacts physical, social and psychological aspects of their lives (1).

Current treatment options in the management of OAB are behavioral treatment (lifestyle change and bladder training), physiotherapy and rehabilitation approaches, pharmacological agents, interventional (botulinumtoxin A injection, sacral neuromodulation, etc.) and surgical methods. Physiotherapy approaches such as pelvic floor muscle training, electrical stimulation (ES) and kinesio taping are effective methods in treatment of OAB (2). ES can be used to improve the bladder neuromuscular mechanism through stimulating and inhibitory stimuli and the strength of pelvic floor muscles (PFMs). The purpose of parasacral transcutaneous electrical nerve stimulation (TENS) in management of OAB is to inhibit the presynaptic afferent neurons that carry impulses from the bladder by stimulating the peripheral segmental dermatome nerves. Thus, it can affect neural pathways that modulate afferent/efferent impulses in spinal and supraspinal areas (3). It was observed that the number of studies examining the effects of parasacral TENS in women with OAB was limited in the literature. Additionally, to our knowledge, it was determined that a standard protocol was not used in terms of application frequency in these studies. The aim of this study was to compare the effects of parasacral TENS protocols in women with OAB.

Study design, materials and methods

This clinical study was conducted between March 2023 and December 2023. Women diagnosed with OAB between the ages of 18-65 were included in the study. Exclusion criteria were pregnancy, loss of sensation, presence of infection, using pacemaker/metal implants, malignant disease, serious cardiovascular problem, lumbosacral nerve damage, having serious pelvic organ prolapse (above stage 2), mental problems that prevent cooperation. Women were randomly divided into 2 groups: once session TENS per week (group 1), three session TENS per week (group 2). ES application was applied in the prone position with a TENS (Intelect, Chattanooga group, USA) device with a pulse width of 200 milliseconds and a current frequency of 10 Hz. Electrodes were placed bilaterally on parasacral region (Figure 1). It was applied for 30 min and 6 weeks.

Bladder function (average number of void/day and voids/night) with a 3-day bladder diary, OAB symptoms with Overactive Bladder Assessment Form (OAB-V8) and Patients’ Perception of Intensity of Urgency Scale (PPIUS), quality of life with the King’s Health Questionnaire (KHQ) were evaluated at pre and post-intervention. Perception of subjective improvement (PSI) with Likert-type scale were evaluated at post-intervention.

The required sample size for the study was calculated with the G*Power program. According to the OAB-V8 results of the pilot study, the effect size was detected. It was calculated that a sample consisting of 24 patients (12 per group) was needed to obtain 80% power with d = 0.278 effect size, α = 0.05 type I error, and β = 0.20 type II error.

For statistical analysis, IBM SPSS Statistics for Windows, v. 26.0 was used. Statistical significance level was accepted as $p<0.05$. Independent samples t-test and Mann Whitney U test were used for comparison of differences between groups. Two-way analysis of variance and Wilcoxon test were used to examine the change over time.. Chi square test statistics (Pearson, Yates, Fisher Exact, etc.) were used to compare groups for categorical variables.

Results and interpretation

Twenty-nine women with OAB (group 1, n= 13; group 2, n=16) were included in this study. At baseline, the descriptive characteristics of the groups were similar ($p>0.05$). No patient reported any adverse effects during the applications.

Significant decrease was observed in the average number of voids/day and PPIUS scores in both groups (except for number of voids/night in the control group) ($p<0.05$). A decrease in OAB-V8 score was found in group 2 ($p<0.05$). Additionally, no significant decrease was observed in group 1 in subscales of KHQ scores, but improvement was observed in all subscale scores in group 2 ($p<0.05$). In intergroup comparisons, a greater decrease was detected in OAB-V8, PPIUS and KHQ scores (role limitation, physical limitation, social limitation, emotional problems and sleep/energy disturbance) in group 2 compared to group 1 ($p <0.05$) (Table 1). The PSI increased in both groups, however, it was found that there was a greater increase in group 2 compared to group 1 ($p<0.05$).

In this study, it was observed that the treatment applied in both TENS application protocols improved bladder function by reducing the average number of voids. Improvement in quality of life was seen only in parasacral TENS applied at 3 times a week. Moreover, significant improvement was observed in OAB symptoms, the feeling of urgency and some subheadings of quality of life (role limitation, physical limitation, social limitation, emotional problems and sleep/energy disturbance) in parasacral TENS applied at 3 times a week. It was observed that the patients' PSI increased the most in parasacral TENS applied at 3 times a week.

Table 1. Comparisons of voiding diary, OAB-V8, PPIUS and KHQ scores of groups’ pre-intervention, post-intervention and between groups.

	Group 1 (n=13) Median (min-max) (X±SD)	Group 2 (n=16) Median (min-max) (X±SD)	BG-p value
Bladder Diary (3days)			
Average number of voids/day			
Pre-intervention	10.3 (8-15)	12.15 (8.3-26.5)	0.249
Post- intervention	10.0 (4.6-14)	8.33 (4.7-25)	0.948**
WG p-value***	**0.006**	**<0.001**	
Average number of voids/night			
Pre-intervention	1.0 (0.0 -4.0)	1.0 (0.0 -4.0)	0.589
Post- intervention	1.0 (0.0 -3.0)	0.15 (0.0-3.3)	0.199**
WG p-value***	0.168	**0.047**	
OAB-V8			
Pre-intervention	22.62 ± 7.84	26.06 ± 7.79	0.248
Post- intervention	20.0 ± 6.78	7.81 ± 5.50	**<0.001**
WG p-value[a]	0.05	**<0.001**	
PPIUS			
Pre-intervention	3.0 (2.0-3.0)	3.0 (2.0- 4.0)	**0.025****
Post- intervention	2.0 (2.0-3.0)	1.0 (0.0- 3.0)	**0.001****
WG p-value***	**0.046**	**<0.001**	
KHQ			
General Health			
Pre-intervention	50 (25-100)	50 (25-100)	0.779
Post- intervention	50 (25 -100)	41.67 (0.0-100)	0.846
WG p-value***	0.424	**0.028**	
Incontinence Impact			
Pre-intervention	100 (16.66-100)	100 (33.33-100)	0.423
Post- intervention	66.66 (8.33-100)	33.33 (0.0-100)	0.170
WG p-value***	0.138	**0.002**	
Role Limitation			
Pre-intervention	66.66 (33.33-100)	66.67 (0.0-100)	0.779
Post- intervention	66.66 (33.33-100)	16.67 (0.0-83.33)	**0.003**
WG p-value***	0.059	**0.001**	
Physical Limitation			
Pre-intervention	55.55 (11.11-100)	66.67 (0.0-100)	0.398
Post- intervention	44.44 (11.11-88.88)	8.33 (0.0-66.67)	**0.015**
WG p-value***	0.285	**0.002**	
Social Limitation			
Pre-intervention	33.33 (11.11-100)	33.33 (0.0-999)	0.983
Post- intervention	33.33 (11.11-100)	5.56 (0.0-55.56)	**0.015**
WG p-value***	0.180	**0.008**	
Personal Limitation			
Pre-intervention	0.0(0.0-100)	0.0(0.0-100)	0.999
Post- intervention	0.0(0.0-100)	0.0(0.0-55.56)	0.329
WG p-value***	0.317	**0.027**	
Emotional problems			
Pre-intervention	77.77 (33.33-100)	44.44 (0.0-100)	0.199

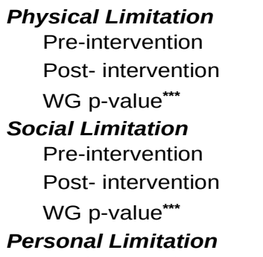
** Mann Whitney U test ,*** Wilcoxon test

a Repeated measures two way anona test

Conclusions

Parasacral TENS applied at 3 times a week is more effective in improving bladder functions, OAB symptoms, quality of life and PSI than parasacral TENS applied at once a week. This protocol applied at 3 times a week can be recommended to OAB patients both as a home program and in clinics.

Figure1. Parasacral TENS application



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