Kapsamlı Pelvik Fizyoterapinin Parkinson Hastalığındaki Otonomik Bozukluklar Üzerine Erken ve Uzun Dönem Etkileri: Olgu sunumu

Early and Long-Term Effects of Comprehensive Pelvic Physiotherapy on Autonomic Disorders in Parkinson's Disease: A case report

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ÖZ

Parkinson hastalığı, hem motor hem de non-motor semptomlarla karakterize nörodejeneratif bir hastalıktır. Bu hasta popülasyonunda otonomik bozukluklara bağlı gelişen pelvik taban disfonksiyonları sık görülür. Bu olgu sunumunun amacı, otonomik disfonksiyon bulguları olan Parkinson hastası bir kadına uygulanan kapsamlı pelvik fizyoterapinin kısa ve uzun vadeli etkilerini incelemektir. Mesane günlüğü, pelvik taban distres envanteri-20, aşırı aktif mesane sorgulama formu, inkontinans şiddet indeksi, inkontinans etki sorgulaması kısa formu, pelvik taban kas değerlendirmesi 12 haftalık kapsamlı pelvik fizyoterapi programından önce, program tamamlandıktan hemen sonra ve 1 yıllık takibin ardından tekrar uygulandı. Hasta, kısa dönemde tüm parametrelerde iyileşme gösterirken uzun dönemde de kazanımlarını korudu. Kapsamlı pelvik fizyoterapi programının, Parkinson hastalığında görülen pelvik taban disfonksiyon semptomlarını ve yaşam kalitesini non-invaziv olarak iyileştirebilen, etkili bir yöntem olduğunu düşünmekteyiz.

Anahtar kelimeler: anal inkontinans; aşırı aktif mesane; mesane günlüğü; pelvik taban disfonksiyonu; pelvik taban kas eğitimi

ABSTRACT

Parkinson's disease is a neurodegenerative disease characterized by both motor and non-motor symptoms. Pelvic floor dysfunction due to autonomic disorders are common in this population. The purpose of this case report is to assess the early and long-term effects of comprehensive pelvic physiotherapy on autonomic dysfunction in a woman with Parkinson's disease. Bladder diary, Pelvic Floor Distress Inventory-20, Overactive Bladder Questionnaire, Incontinence Severity Index, Incontinence Impact Questionnaire- short form, and PERFECT scheme were evaluated at baseline, immediately after the 12-week comprehensive pelvic physiotherapy program, and after 1-year follow-up. Improvements were detected in all parameters in the short term and maintained in the long term. We think that a comprehensive pelvic physiotherapy program is an effective method that can non-invasively improve the symptoms of pelvic floor dysfunction and quality of life seen in Parkinson's disease.

Key words: anal incontinence; overactive bladder; bladder diary; pelvic floor dysfunction; pelvic floor muscle training

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Introduction

Parkinson's disease (PD) is a neurodegenerative disease characterized by motor symptoms that develops due to the progressive loss of dopaminergic neurons in the substantia nigra. The pathology is not limited to the mesencephalon but expands to large brain regions including non-dopaminergic neurons (1). Although motor deficits form the basis of clinical diagnosis, non-motor symptoms may occur in the earlier stages of the disease (2). The most common non-motor symptom is autonomic dysfunction and affects more than 70% of patients (3). Gastrointestinal and urogenital dysfunctions are the most common symptoms of dysautonomia (4-6). Although there is increasing evidence of the negative impact of non-motor symptoms on health-related quality of life, the literature remains insufficient on the treatment of these problems (7).

Pelvic floor dysfunction is an umbrella term for urinary and gastrointestinal symptoms such as urinary incontinence, pelvic organ prolapse, and anal incontinence (feces and gas) (8). The worldwide prevalence of pelvic floor dysfunction reaches 60% (9). This rate is much higher in women with Parkinson's disease than in the general population (10). Current guidelines recommend pelvic physiotherapy as the first line treatment in the algorithms of pelvic floor dysfunction. Comprehensive pelvic physiotherapy includes personalized treatments such as lifestyle modifications, pelvic floor muscle training, tibial nerve stimulation, bladder training, and bowel training (11).

This case report presents the early and long-term effects of comprehensive pelvic physiotherapy on pelvic floor dysfunction in a woman with Parkinson's disease.

Case Report

A 64-year-old female patient with Parkinson's disease was referred to the physiotherapy clinic from the urology department with the diagnosis of overactive bladder. The patient, who has been regularly participating in a conventional neurological rehabilitation program for a year in terms of motor symptoms related to Parkinson's disease, had not received any pelvic physiotherapy program before. In the medical history, she had three pregnancies; one miscarriage and two vaginal births. She was using levodopa and muscarinic receptor agonist as medication. According to the Pelvic Organ Prolapse Quantification system (POP-Q), there was grade 2 apical and posterior wall prolapse.

The patient was asked to keep a bladder diary for three days and the average of the data was recorded (12). Pelvic floor dysfunction was assessed with the Pelvic Floor Distress Inventory-20 (PTDE) (13). In addition, the Incontinence Severity Index (ISI) (14), Fecal Incontinence Severity Index (15) and, Incontinence Impact Questionnaire (IIQ-7) (16) were used to evaluate the severity of incontinence and Overactive Bladder Questionnaire (OAB-V8) (17) was used to evaluate the quality of life. Results were obtained at baseline, immediately after the comprehensive pelvic rehabilitation program, and after one year follow-up (Table 1).

A comprehensive pelvic physiotherapy program was applied for 12 weeks, under the supervision of a physiotherapist 1 day a week and home-based on all other days. Throughout the program, a "tracking diary" was provided each week to assess and encourage the patient's participation in home-based exercises. In the first session, the patient was taught lifestyle modifications including fluid management, urge supersession and distraction techniques, and the Knack maneuver. Bladder and bowel training were given based on a bladder diary. To design the patient-tailored pelvic floor muscle training program (PFMT), pelvic floor muscle function was determined using the PERFECT scheme with bimanual palpation (18).

PFMT started with 10 sets of 10 repetitions of fast and 10 repetitions of slow contractions per day. PFMT progression was achieved by increasing the number of daily sets to 30, adding contractions of other core muscles to isolated pelvic floor muscle contractions, and switching from gravity assisted positions to against gravity positions. Connective tissue massage and transcutaneous tibial nerve stimulation (TTNS) were applied once a week by a physiotherapist. At the end of 12 weeks, the patient was advised to continue the lifestyle modifications and to maintain pelvic floor muscle contractions during functional activities.

Table 1. Outcomes at baseline, after treatment, and at one-year follow-up

	Baseline	After Treatment	Follow-up
PERFECT scheme*	4/10/9/5/+/-/+	5/10/10/10/+/+/+	5/10/10/10/+/+/+
Bladder diary			
Amount of drink (ml)	2200	2400	2200
Daytime frequency (times/day)	16	9	8
Nocturia (times/day)	4	0	0
Urgency (times/day)	6.67	2	3
Urge urinary incontinence (times/day)	2	0	0
Incontinence Severity Index	9	0	0
Incontinence Impact Questionnaire-Short Form	47.62	0	0
Overactive Bladder Questionnaire	85	3	3
Urge fecal incontinence (times/day)	1	0	0
Fecal Incontinence Severity Scale	38	6	6
Pelvic Floor Distress Inventory-20			
PFDI-urinary	58.33	4.17	4.17
PFDI-colorectal	81.25	18.75	25
PFDI-prolapse	25.00	8.33	1.17

* PERFECT scheme elements: power/endurance/repetition/fast/elevation/co-contraction/timing

When comparing the results measured at baseline and after the treatment program, an improvement in bladder diary parameters was found. A decrease was observed in all parameters evaluating the symptoms and severity of urinary and anal incontinence. The patient's complaints of involuntary urinary and fecal leakage ended, and the feeling of urgency and gas incontinence symptoms decreased. Improvement was achieved in the PERFECT scheme elements. A decrease was detected in all sub-parameters of PFDI-20. One year follow-up results showed that the improvements after treatment were maintained.

Discussion

The results of this case study showed that a comprehensive pelvic physiotherapy program prescribed for patients diagnosed with Parkinson's disease improved pelvic floor muscle strength, dysfunction symptoms, and quality of life. The improvements achieved in the treatment program were maintained at one year follow-up. Although Parkinson's disease is a neurological disease characterized by motor deficits, it often also presents non-motor symptoms such as autonomic dysfunction (3). Bladder dysfunction is one of the most common autonomic disorders due to Parkinson's disease (19). Overactive bladder symptoms, such as urge incontinence and nocturia, are associated with falls (a predictor of mortality in Parkinson's disease) (20, 21). Bladder dysfunction does not respond to levodopa, which is used in the pharmacological treatment of motor disorders seen in Parkinson's disease (22).

Although there is evidence that anticholinergic drugs reduce urinary incontinence without reduction in frequency (23), it is known that this pharmacological treatment negatively affects cognitive functions in Parkinson's disease and also causes side effects such as dry mouth, dizziness and constipation (24, 25). At this point, non-invasive pelvic physiotherapy practices with minimal risk of complications become important.

In their randomized controlled study, Vaughan et al. (2019) investigated the early effects of behavioral therapy on urinary symptoms in Parkinson's disease. The treatment group received behavioral therapy including pelvic floor muscle contractions (3x15 contractions/day) and patient education, for 8 weeks, while the control group received motor skill exercises involving the upper extremity. When outcomes were evaluated, no significant difference was found between the two groups in terms of incontinence frequency and overactive bladder symptom scores (26). We think that this result is due to the insufficient duration of

the treatment program and the lack of progress in the pelvic floor muscle training program. McDonald et al. (2020) showed in their study that a 12-week treatment program consisting of voiding schedule, distraction techniques and PFMT reduced bladder symptoms and improved quality of life in Parkinson's disease (27). In a more recent randomized controlled study, Araujo et al. (2021) evaluated the early and long-term effects of TTNS in women with Parkinson's disease. After 12 weeks of intervention, the treatment group (receiving TTNS) achieved significant improvements in nocturia, urgency, urinary incontinence episodes, and OAB-V8 score compared to the sham group, and the improvement continued in the long term (28). After a 12-week comprehensive pelvic physiotherapy program, we found an improvement in our patient's day-time frequency, nocturia and urgency symptoms, an increase in quality of life (IIQ-7) and a decrease in symptom bother (OAB-V8 and PFDI-urinary) without a decrease in the amount of fluid consumed. We found that the patient, who initially had severe urinary incontinence, was completely relieved after treatment. We also found that the patient maintained the health status after 1 year follow-up.

Another common autonomic dysfunction present in Parkinson's disease is bowel dysfunction. It is known that bowel dysfunction in neurological diseases is associated with low quality of life (29). However, the literature is insufficient regarding the conservative treatment of anal incontinence in Parkinson's disease. As a result of the examinations, no study was found investigating the effect of pelvic physiotherapy on anal incontinence in Parkinson's disease. In our study, after the 12-week treatment program and one-year follow-up, we found that the patient's complaint of flatus incontinence decreased, and the complaint of fecal incontinence was completely relieved. Additionally, our patient's colorectal bother (PFDI-colorectal) was greatly reduced. The reason why the flatus incontinence does not end even though the fecal incontinence has completely disappeared may be that the proprioceptive sensation created by the stool in the rectum is not sufficiently provided by the gas.

We think that a comprehensive pelvic physiotherapy program is an effective method that can non-invasively improve the pelvic floor dysfunction symptoms and quality of life seen in Parkinson's disease. In addition, a treatment protocol that is comprehensive and applied for a sufficient duration can ensure that the results last for a long time. Randomized controlled studies are required to understand which component of the treatment protocol contributes more to improvements and to generalize the effectiveness of this protocol in this patient population.

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