

Ćwiczenia mięśni dna miednicy w leczeniu pomenopauzalnego nietrzymania moczu – przegląd badań

Pelvic floor muscle training in the treatment of postmenopausal urinary incontinence – a review of studies

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Streszczenie

Nietrzymanie moczu (NT) jest zdefiniowane jako niekontrolowany wyciek moczu poprzez cewkę moczową. Choroba ta jest obecnie dużym problemem zdrowotnym i społecznym. Fizykoterapia jest jedną z metod leczenia zachowawczego NT. Wśród metod fizykalnych stosowanych w leczeniu tego schorzenia należy wymienić: ćwiczenia mięśni dna miednicy, elektrostymulację, biologiczne sprzężenie zwrotne i magnetoterapię. Skuteczność elektrostymulacji udowodniono w licznych badaniach, ale nie wszystkie pacjentki, szczególnie te w wieku pomenopauzalnym, decydują się na tę formę terapii z powodu gorszej tolerancji lub / i nadmiernego obciążenia psychicznego. Dlatego też, niniejszy artykuł jest próbą odpowiedzi na pytanie, czy ćwiczenia mięśni dna miednicy stosowane w monoterapii lub skojarzone z biofeedbackiem i/lub stosowaniem stożków dopochwowych mogą być skuteczną alternatywą w leczeniu pomenopauzalnego nietrzymania moczu. (Gerontol Pol 2015, 3, 143-58)

Słowa kluczowe: *pomenopauzalne nietrzymanie moczu, ćwiczenia mięśni dna miednicy, ćwiczenia Kegla, biofeedback, elektrostymulacja, stożki dopochwowe*

Abstract

Urinary incontinence (UI) is defined as the uncontrolled leakage of urine through the urethra. This disease is now a big health and social problem. Physiotherapy is one of the methods of conservative treatment for UI. Among the physical methods used in the treatment of urinary incontinence are: pelvic floor exercises, electrical stimulation, biofeedback and magnetotherapy. The effectiveness of electrical stimulation has been proven by numerous studies, but not all patients, especially those at postmenopausal age, decide to have this form of therapy due to poorer tolerability or excessive psychological burden. Therefore, this article attempts to answer the question of whether pelvic floor exercises used as monotherapy or in combination with biofeedback and/or vaginal cones may be an effective alternative in the treatment of postmenopausal urinary incontinence. (Gerontol Pol 2015, 1, 143-58)

Key words: *postmenopausal urinary incontinence, pelvic floor muscle training, Kegel exercise, biofeedback, electrostimulation, vaginal cones*

Introduction

According to the World Health Organization (WHO) and the International Continence Society (ICS) urinary incontinence (UI) is defined as an objectively shown, involuntary loss of urine [1]. According to the Standardization Committee of ICS, there are three main types of urinary incontinence: stress urinary incontinence (SUI), urge urinary incontinence (UUI) and mixed urinary incontinence (MUI) [2]. At the menopause, incontinence disorders become one of the most frequently reported symptoms, significantly affecting and decreasing women's quality of life. In Poland, the incidence of UI in women during menopause is estimated at 33% [3]. Urinary incontinence is treated conservatively (pharmacologically and non-pharmacologically) and surgically. Physiotherapy is one of the conservative methods of treatment of urinary incontinence. The physical methods used in the treatment of this disease include pelvic floor exercises, electrical stimulation, biofeedback and magnetotherapy. The National Institute for Health and Care Excellence (United Kingdom) recommends pelvic floor muscle training (PFMT) comprising at least eight contractions three times a day for at least three months as first-line therapy for women with SUI [4]. They do not recommend electrical stimulation or intravaginal devices for women who can actively contract their pelvic floor muscles. The American College of Obstetricians and Gynecologists recommends PFMT as first-line therapy for women with SUI and states that PFMT is more effective than electrical stimulation or vaginal cones [5].

In accordance with the guidelines from 2010, the Polish Gynecological Society recommends transvaginal electrical stimulation combined with exercises as one of the methods of physical therapy in the treatment of stress urinary incontinence. This method, however, is not recommended as the first-line treatment for overactive bladder [6].

The effectiveness of electrical stimulation has been proven by many scientific studies [7] However, not all patients, especially those at postmenopausal age, decide to have this form of therapy, due to poorer tolerability or excessive psychological burden. Therefore, this article attempts to answer the question of whether pelvic floor exercises used as a monotherapy or in combination with biofeedback and/or vaginal cones may be an effective alternative in treatment of postmenopausal urinary incontinence.

Objective

The aim of the study was to analyse data that can be found in the literature concerning the evaluation of the effectiveness of pelvic floor muscle exercises for the treatment of SUI in postmenopausal women based on articles available in PubMed and Medline. The databases were searched using the following keywords: postmenopausal urinary incontinence, pelvic floor muscle training, Kegel exercise, biofeedback, electrostimulation, vaginal cones.

Review of the literature

In their study, Betschart et al. [8] compared the efficacy of pelvic floor exercises in women before and after menopause with SUI, MUI and UUI. To evaluate the effectiveness of the therapy they used a four-point Likert scale. Satisfactory results were obtained in 59% of premenopausal women and in 70% of patients in the postmenopausal period. Sar et al. [9] estimated the effectiveness of PFMT in a group of 41 women with SUI and MUI. The mean age of the women was 41.82 +/- 8.65 years. The exercise program lasted eight weeks. The study showed statistically significant improvement in results in a one-hour pad test, episodes of leakage in a three-day bladder diary, PFM strength, and I-QOL scores.

Nygaard et al. [10] estimated the effectiveness of PFMT in women with SUI and UUI before and after menopause. Eighty-two women who participated in the study were divided into two groups: those < 45 years (n = 47) were all premenopausal, and those > 55 years (n = 35) were all postmenopausal. The treatment was carried out for a period of six months. The therapy was supplemented with biofeedback in women who had problems with the performance of exercises. The results showed a significant improvement in the symptoms of SUI and UUI. There were no statistically significant differences between the groups.

In the study conducted by Borello-France et al. [11], forty-four women with a mean age of 52.6 years (SD=8.5) were enrolled in a nine- to twelve-week intervention trial. Fifty-seven percent of this sample were postmenopausal, and their mean number of urine leaks per week recorded in their preintervention bladder diaries was 7.0 (SD = 6.2). Thirty-six (82%) of these women completed the nine- to twelve-week intervention. The women were randomly allocated to two experimental groups. Group I performed pelvic floor exercises once a week, while Group II – four times a week. The Impact Questionnaire [IIQ scores) and an urodynamic test were

used in order to evaluate the effectiveness of the applied therapy. The results showed the effectiveness of the exercise program with no significant differences between the groups. In another study, the same authors [12] compared the effectiveness of Kegel exercises performed in different positions (lying, sitting and standing). The symptoms of SUI decreased by 78.8%, but the position in which the exercise was performed had no significant impact on the results.

In their study, Cammu et al. [13] divided sixty elderly women into two groups. Group I performed Kegel exercises (for one week), while Group II used vaginal cones (for two weeks). The study demonstrated the efficacy of both therapies, however, during the treatment fourteen women withdrew from the group that used vaginal cones. In another study, the same authors evaluated the persistence of the effects of pelvic floor exercises after ten years following the end of treatment. Fifty-two women (mean age 61 years) were sent a questionnaire and asked to assess treatment effects. The results showed the persistence of the effects in 66% of women [14].

Long-term effects of PFMT in elderly women were also evaluated by Bř et al. [15] and Simard C. et al. [16]. Both studies have shown that pelvic floor muscle rehabilitation for urinary incontinence remains highly effective for up to five years in elderly women and most women continue to perform PFM exercises five years after completing their physiotherapy education sessions.

Parkkinen et al. [17] compared the efficacy of electrical stimulation (ES), pelvic floor exercises and training with a vaginal ball (VB) in women with SUI. Thirty-three women with SUI (mean age 46.5 years) participated in the five-year follow-up study. The women were divided into two groups: Group I (n = 16) – outpatient clinic group and Group II (n = 17) – home group. Both groups had an active PFMT program and they used a VB during daily activities for intensive pelvic floor muscle training. Group I was also treated at the outpatient clinic with maximal interferential ES, using frequencies varying from 10 to 50 Hz, and individually instructed exercises with biofeedback were carried out at the same time, once a week, an average of nine times in the first year. After baseline examinations, both groups visited the outpatient clinic at 4 months, 12 months, and at 5 years. At 12 months, there were no statistically significant differences between the study groups in any of the outcome variables, but within the groups both the subjective and objective results were significantly better in comparison with the initial values. After 12 months, two (3%) patients in Group I continued physiotherapy and seven (41%) patients in Group II needed physiotherapy because of an unsatisfactory outcome. At 5 years, accor-

ding to the urinary incontinence severity score (UISS) questionnaire, subjective discomfort had decreased in both groups and 21 of the 33 women (64%) perceived a subjective cure or improvement in their condition. The results showed that home-based PFMT and training with a VB proved to be equally effective as once-a-week supervised therapy (interferential ES), and the five-year follow-up results demonstrated a successful response in the treatment of female SUI.

Huebner et al. [18] compared the efficiency of PFMT, surface electrical stimulation and transvaginal electrical stimulation in the treatment of SUI. The therapy lasted 12 weeks. The results demonstrated the efficacy of all the forms of therapy without statistically significant differences between the groups.

Similar conclusions about the effectiveness of such types of therapy are presented by Capobianco et al. [19]. The authors compared the effectiveness of pelvic floor exercises and vaginal administration of estriol (intravaginal estriol) in a group of 206 postmenopausal women with stress urinary incontinence. One hundred and three patients were performing pelvic floor exercises and took one vaginal estriol globule once a day for two weeks, then two globules - once a week. The therapy lasted for six months. The control group that also included 103 patients used only vaginal estriol globules. The highest efficiency results were obtained in the group of patients subjected to the combination therapy and therefore the authors recommend pelvic floor exercises combined with intravaginal administration of estriol as an effective treatment for urinary incontinence in postmenopausal women.

Ishiko et al. [20] examined sixty-six women with stress urinary incontinence after menopause. They randomly assigned patients to two groups. Group I (n = 32) used estriol (1 mg / day) and did pelvic floor exercises, while Group II (n = 34) performed only pelvic floor exercises. Efficacy was evaluated every three months based on stress scores obtained from a urinary incontinence (UI) questionnaire. The results of this study showed statistically significant improvement in mild to moderate forms of urinary incontinence in both groups (p < 0.0001) after three months of therapy. But the therapeutic effect in the Group I was more pronounced for an 18-month period in mild urinary incontinence and for 12 months in moderate incontinence compared to Group II. The authors put forward a proposal that the combination therapy (estriol and pelvic floor exercises) is effective and should serve as the first-choice therapy method in the mild form of urinary incontinence.

Similar conclusions are presented by Pereira [21]. He examined forty-five postmenopausal women with stress

urinary incontinence. The experimental group was divided into three groups: Group I (n = 15) used vaginal cones, Group II (n = 15) performed pelvic floor exercises and Group III (n = 15) was the control group. The therapy in each experimental group took 40 minutes and was conducted for six weeks, two times per week. The effectiveness of the therapy was assessed using a one-hour pad test (for urinary loss and pelvic floor muscle pressure) and the secondary outcomes (quality of life with King's Health Questionnaire), satisfaction with treatment, and continuity of training. The study showed improvement in all tests, but no significant differences between the groups.

Spruijt et al. [22] compared the efficacy of electrical stimulation of the pelvic floor muscles and Kegel exercises in the treatment of urinary incontinence in a group of postmenopausal women over 65 year of age. Twenty-four women were subjected to electrical stimulation treatments and 11 women performed Kegel exercises. The therapy in both groups lasted eight weeks. The effectiveness of the treatment was assessed by: 1) urinary leakage (during a standardized PAD test), (2) pelvic muscle strength (measured by a perineometer), and (3) detrusor instability (on ambulant urodynamic registration). The results showed no significant differences between the groups. The authors put forward very interesting conclusions. Treatment of elderly women using electrical stimulation is mentally aggravating, and therefore the use of Kegel exercises should be considered.

Bř et al. [23] compared the effectiveness of the pelvic floor muscle training, electrical stimulation and vaginal cones in the treatment of SUI. One hundred and seven women with SUI diagnosed with urine leakage > 4 g measured by a pad test with a standardized bladder volume (200 ml) were divided into four groups: Group I (n = 25) – pelvic floor exercises performed three times a day at home, combined with additional training in groups once a week for 45 minutes under the direction of a physiotherapist; Group II (n = 25) – transvaginal electrical stimulation at a frequency of 50 Hz for 30 minutes a day; Group III (n = 27) – vaginal cones daily for 20 minutes; Group IV (n = 30) – no treatment.

The effectiveness of the therapy was assessed by a pad test, a subjective evaluation of the patients and an increase of the pelvic floor muscle strength measured with a balloon catheter placed in the vagina. The study showed the greatest improvement in muscle strength after 6 months of treatment in women using pelvic floor exercises. The leakage of urine in the pad test decreased among women performing pelvic floor exercises. Objective recovery (urine leakage in the pad test = < 2 g) was achieved in 11 women performing pelvic floor muscle

exercises, in 7 using electrical stimulation, in 4 using vaginal cones and in 2 from the control group. Based on the patients' assessment, a complete relief of symptoms of stress urinary incontinence was found in 14 women performing pelvic floor exercises, in 3 using electrical stimulation, in 2 using vaginal cones and only in 1 patient from the untreated group.

Three women did not complete the study and 10 withdrew during its course, including 7 of the group where electrical stimulation was planned. The authors have drawn the following conclusions:

- pelvic floor muscle training is the most effective method in women with SUI (satisfactory improvement in 56% of patients);
- electrical stimulation and vaginal cones bring less benefit in the treatment of this disease and are less well tolerated by patients.

Santos et al. [24] compared the effects of functional electrical stimulation of the pelvic floor muscles and vaginal cone therapy in women with stress urinary incontinence. In Group I, the following parameters of electrical stimulation were used: 50 Hz, pulse duration – 1 ms, intensity – up to 100 mA, treatment time – 20 minutes and therapy duration – 4 months. Group II underwent two 45-minute sessions per week using vaginal cones weighing 20-100 g. The effects of the therapy were assessed using a voiding diary, a pad test and a quality of life questionnaire. Both therapies proved to be effective and no differences in the results between the groups were observed.

Castro et al. [25] also compared the effectiveness of pelvic floor exercises, electrical stimulation and vaginal cones in women with SUI. One hundred and eighteen patients were randomized into three groups. Group I (n = 31) performed PFMT, Group II (n = 27) used vaginal cones and Group III (n = 30) was a placebo group. The efficacy of therapy was assessed after the treatment and after 6 months of its completion using: a pad test, a quality of life questionnaire, an urodynamic test and a voiding diary. A statistically significant improvement in all tested parameters was found in Group I and Group II, with no significant differences between the groups.

Williams et al. [26] evaluated the effectiveness of PFMT in women with SUI and MUI, who had not achieved satisfactory results after behavioural therapy. Two hundred and thirty-eight women were divided into three groups: Group I (n = 79) used PFMT, Group II (n = 80) used vaginal cones and Group III (n = 79) continued the behavioural therapy. The treatment was carried out for 3 months. The effectiveness of therapy was assessed using: a pad test, an assessment of pelvic floor muscle function, an assessment of urinary frequency and an assessment of

quality of life. All three groups had a moderate reduction in UI episodes after intervention but there was no statistically significant difference among the groups. There were marginal improvements in voiding frequency for all groups, with no statistically significant difference among them. In women who have already had simple behavioural therapies (including advice on PFM exercises) for urinary dysfunction, the continuation of these behavioural therapies can lead to further improvement. The addition of vaginal cone therapy or intensive PFMT does not seem to contribute to further improvement. The improvement in pelvic floor function was significantly greater in the PFMT arm than in the control arm although this did not translate into changes in urinary symptoms.

Seo et al. [27] compared the efficacy of biofeedback and vaginal cones in the treatment of urinary incontinence. The treatment lasted for 6 weeks. The improvement was found in 88.3% of women who used biofeedback and in 91.6% of women using vaginal cones.

On the other hand, Capelini et al. [28] evaluated the effectiveness of pelvic floor exercises combined with biofeedback in 14 patients with SUI. The treatment was carried out for a period of 12 weeks. The efficacy of therapy was evaluated by urodynamic studies, a pad test, a voiding diary and the King's Health Questionnaire. The studies showed a statistically significant improvement in all the tested parameters. The results remained at similar levels 3 months after treatment.

Neuman et al. [29] conducted a seven-year observation study of 390 women with SUI (80%) and UUI (20%). The study showed a very high efficacy of treatment involving biofeedback and pelvic floor exercises, both immediately after therapy and during an average of 2.8 years following its completion. Before therapy, patients with third-degree stress urinary incontinence accounted for 60%, with second-degree SUI – 21% and with first-degree SUI – 10%. After treatment, third-degree stress urinary incontinence persisted in 5% of women, second-degree in 19% and first-degree in 26%. An improvement in the symptoms of urinary incontinence was confirmed by 95% of women in their self-assessment. On average, 2.8 years after treatment, 71% of the examined women confirmed the persistence of the effects of therapy.

Hirakawa et al. [30] compared the efficacy of PFMT and PFMT with biofeedback in patients with SUI. The therapy lasted 12 weeks. The efficacy of treatment was assessed using the King's Health Questionnaire, the International Consultation on Incontinence Questionnaire-Short Form (ICIQ-SF), a voiding diary and a one-hour pad test. The results showed the efficiency of both forms of therapy without significant differences between the groups.

Sherburn et al. [31] compared the effectiveness of PFMT and bladder training (BT) in a group of 93 elderly women with SUI. BT consists in performing day-long control of urination and recording hours, the amount of excreted urine and the frequency of episodes of SUI. This allows for the creation of such a frequency of bowel movements that prevents bladder overfilling and urinary urgency. The results showed greater efficacy of PFMT.

Discussion

The analysis of data found in the reference literature has shown that Kegel muscle exercises are effective treatment for urinary incontinence in postmenopausal women. All of the cited studies have demonstrated the effectiveness of pelvic floor exercises in the treatment of stress urinary incontinence, urge urinary incontinence and mixed urinary incontinence. The results of this meta-analysis suggest that the efficacy of Kegel exercises is comparable with the other methods of treating urinary incontinence (vaginal cones, a vaginal ball and vaginal electrical stimulation). Bř et al. [23] have, however, that PFMT is most effective, compared with vaginal cones and electrical stimulation. It is also important that 10 patients withdrew from the study during its course, including 7 from the group where electrical stimulation was planned. They might have resigned from the therapy due to their poorer tolerance. The authors also point to the fact that 2 patients using electrical stimulation and 4 patients using vaginal cones complained of side effects, however, did not require discontinuation of treatment, and that most women wanted to continue treatment in the group performing pelvic floor muscle exercises. Similar conclusions have been reached by Spruijt et al. [22] who suggest that the treatment of elderly women using electrical stimulation therapy is mentally aggravating, and therefore the use of Kegel exercises should be considered. In the study conducted by Cammu et al. [12], 14 women withdrew during treatment from the group who used vaginal cones, suggesting that this form of therapy may also cause discomfort in elderly women. Beneficial effects of combining pelvic floor exercises and vaginal cones with hormonal therapy have been demonstrated in two studies [19,20].

The duration of PFMT therapy is also an important aspect. In the cited study, therapy lasted from six weeks to six months, and only in the study conducted by Cammu et al. [13], the exercise program lasted for a period of one week, but satisfactory results were obtained also in this case. It is also important in each therapy to achieve long-term effects. In this context, the study by Neuman et al. [29] is particularly interesting as they observed the

effects of therapy (biofeedback and PFMT) after seven years of its completion. On average, 2.8 years after treatment, 71% of women confirmed the continuation of its effects. Cammu et al. [14] observed the persistence of the effects of therapy in 66% of women after ten years. However, Bř et al. [15] and Simard C. et al. [16] have demonstrated that pelvic floor muscle rehabilitation for urinary incontinence remains highly effective for up to five years in older women and most women continue to perform PFM exercises five years after completing their physiotherapy education sessions. Parkkinen et al. [17] also showed that home-based PFMT and training with a VB proved to be equally effective as once-a-week supervised therapy (interferential ES), and the five-year follow-up results demonstrated a successful response in the treatment of female SUI.

In the studies conducted by Seo [27], Capelini [28] and Neuman [29], pelvic floor exercises were supported by biofeedback. This method is especially useful for women who cannot consciously strongly contract the levator ani muscles. Many patients frequently tighten gluteal muscles and adductor thigh muscles. Almost all patients hold their breath and contract the abdominal muscles when exercising, which gives exactly the opposite effect. Biofeedback technique eliminates the above-mentioned errors. Biofeedback gives you the ability to run the correct muscle groups, control the severity and duration of contraction, relax and make an objective observation of the progress of the therapy. Referring once again to the

study carried out by Neuman [28], it can be concluded that the long-term persistence of treatment effects could be due to the proper technique of performing pelvic floor exercises acquired during the biofeedback training.

Kegel exercises can be performed in different positions. Borello-France et al. [11] have demonstrated that exercise position does not affect the effectiveness of therapy. It is very important for older women because each patient can choose the appropriate form of therapy, depending on the level of physical fitness.

The results of this meta-analysis are very beneficial for postmenopausal women. Properly performed pelvic floor exercises can be a very effective method of treatment of urinary incontinence, which can prevent surgical intervention and improve quality of life. Therefore, this form of treatment should be popularized.

Conclusions

1. Pelvic floor exercises are an effective method of treating various forms of urinary incontinence in postmenopausal women.
2. The results of the presented studies are beneficial for older women, for whom the use of transvaginal electrical stimulation may prove to be too mentally burdensome.

Conflicts of interest

None

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