

Electromyographic evaluation of the effectiveness of electrical stimulation of the pelvic floor muscles in a patient after total hysterectomy

Gabriela Kolodyńska¹ Adrian Sieroń²

¹Academy of Physical Education, Department of Physiotherapy, Department of Physiotherapy in Internal Diseases

²Academy of Physical Education, Faculty of Physical Education, Department of Physical Anthropology

Abstract

Introduction. Total hysterectomy surgery is one of the most difficult operations in gynaecological surgery. It involves removal of the stem and neck cancer. Often removed during surgery are also the ovaries and fallopian tubes. Indication for radical include hysterectomy cervical carcinoma, and adenocarcinoma of the endometrium. Performing this procedure it is always associated with the cessation of menstruation due to lack of the endometrium, which is located in the body of the uterus, in the case of simultaneous removal of the ovaries is created surgically induced menopause status. Endocrine disorders cause a lot of changes in the female body. One consequence may be the occurrence of the phenomenon of stress urinary incontinence.

Objective of the work. The aim of this study was to evaluate the conduct of conservative patient suffering from stress urinary incontinence after total hysterectomy.

Material and methods. The study involved a 60-year old female patient after a total hysterectomy with the removal of the fallopian tubes and ovaries in a problem that stress urinary

incontinence. Before joining the project the patient was subjected to hormonal therapy and applied the pessary coil, which proved ineffective. For objective evaluation of resting bioelectric activity of the pelvic floor muscles used electromyograph Noraxon four-vaginal probe. Furthermore, in order to determine the degree of incontinence questionnaire was used Gaudenz and an analysis of voiding diary. All measurement methods have been made immediately before and after the therapy. The patient was subjected to combination therapy, which included electrical stimulation of the pelvic floor muscle exercises and biofeedback.

Results. After therapy showed an increase in resting bioelectric activity of the pelvic floor muscles. In addition, the patient reported a reduction in symptoms.

Conclusions. Electrical stimulation of the pelvic floor muscle exercises with biofeedback appears to be an effective treatment for urinary incontinence in women after total hysterectomy. Therefore, it seems necessary to continue research and to conduct them on a larger number of patients.

Introduction

Total hysterectomy surgery is one of the most difficult operations in gynecological surgery. It involves removal of the stem and neck cancer. Often removed during surgery are also the ovaries and fallopian tubes. Indication for radical include hysterectomy cervical carcinoma, and adenocarcinoma of the endometrium. Performing this procedure it is always associated with the cessation of menstruation due to lack of the endometrium, which is located in the body of the uterus, in the case of simultaneous removal of the ovaries is created surgically induced menopause status. Endocrine disorders cause a lot of changes in the female body. One consequence may be an instance of the phenomenon of stress incontinence [7].

Urinary incontinence (UI) is characterized by an involuntary leakage of urine due to bladder dysfunction of the locking mechanism and is an important social problem. It is estimated that in Poland this disease affects over 5 million people. According to recent data UI affects women twice as often. This condition occurs in about 25% of women of childbearing age and up 50% in postmenopausal women. In most cases, patients suffer from a form of stress urinary incontinence (SUI), which is a cause of lowering the interfacial tension perineal muscle, fascia, pelvic floor, and the loosening of connective tissue. In 1954 he founded the International Society for. Continence (ICS), which develops standards for the diagnosis and treatment of

urinary incontinence. The main role in the treatment of urinary incontinence should be conservative treatment based on physical therapy and pharmacotherapy. Among the methods of physiotherapy as the most effective method is indicated electrostimulation of the pelvic floor muscle exercises combined with biofeedback [2,3,5,13,18,19].

Objective of the study

The aim of this study was to evaluate the conduct of conservative patient suffering from stress urinary incontinence after total hysterectomy.

Research questions:

- Does the use of electrical stimulation of the pelvic floor biofeedback reduce the problem of urinary incontinence in a patient after total hysterectomy?
- Does the use of electrical stimulation of the pelvic floor biofeedback will increase the resting bioelectric activity of the pelvic floor muscles?

Material and method

The study involved a 60-year old female patient after a total hysterectomy with the removal of the fallopian tubes and ovaries in a problem that stress urinary incontinence. Before joining the project the patient was subjected to hormonal therapy and applied the pessary coil, which proved ineffective. The patient was qualified to research by a gynecologist based on our audit and subjective ultrasound. The doctor said in her second degree of stress urinary incontinence and qualified patient to conservative treatment.

After the classification of patients for testing to determine the degree of urinary incontinence questionnaire was used Gaudenz and an analysis of voiding diary. For objective evaluation of resting bioelectric activity of the pelvic floor muscles used electromyograph Noraxon four-vaginal probe. Measurements were conducted immediately before treatment after 5 and after the treatment. EMG measurement was carried out in the lying position the rear. Measurement of the quiescent lasted 50 seconds and related to an average value of the resting bioelectric activity of the pelvic floor muscles.

The patient was subjected to combination therapy, which included electrical stimulation of the pelvic floor muscle exercises and biofeedback. Parameters for electrostimulation treatment were consistent with the recommendations and literature were performed daily from Monday to Friday for 2 weeks with a fixed time [4,6,12].

Electrostimulation parameters:

- treatment time 30 min

- frequency of 20 Hz,
- the duration of the series of pulses and the time interval in the ratio 1: 1,
- pulse width - 1 ms.
- max flow - 100 mA
- the number of treatments - 10

Biofeedback exercises were held immediately after the electrical stimulation and lasted for 10 minutes. During exercise, the patient alone strained muscles of the pelvic floor in the time indicated by the device. These activities took place with regard to visual and auditory stimuli. They consisted in identifying the correct MDM and learning their isolated contraction. Using the collecting electrode endowaginal signal from muscle tension imaged in real time in the display electromyogram. The patient by means of a feedback performed visual tension and relaxation MDM [1,10,15].

Results

The statistical analysis of the results was performed using Statistica 10.0. In all measurements determined significance level $\alpha = 0.05$. To assess the progress of therapy was used t-test. After therapy showed an increase in resting bioelectric activity of the pelvic floor muscles. The results are shown in Figure 1. Figure illustrates the bioelectric activity of the muscles prior to treatment, after 5 and after the treatment. It is clear that the largest improvement was between 5 and 10 surgery.



Drawing 1 Changes to the rest of bioelectric activity of the pelvic floor muscles due to the therapy

It is also important that after treatment the patient reported relief of symptoms associated with urinary incontinence, which was confirmed in the analysis of voiding diary and questionnaire Gaudenz. In addition, significantly improved the comfort and quality of life. The patient was fully satisfied with the results of therapy.

Discussion

Given in the literature are many factors that can affect the occurrence of urinary incontinence. In Caucasian women as a major cause of the occurrence of this condition mentioned shorter coilweak urinary and pelvic floor muscles. One of the reasons causing such symptoms may be hysterectomy surgery. This treatment is usually associated with the occurrence of cancer. Nevertheless, in reality it is performed most often for other reasons. Hysterectomy is usually performed when a woman has numerous and expanding fibroids. Especially in a situation where cause severe pain and heavy periods extending up to 10 days. In women, the elderly treatment is usually the cause of lowering or loss of reproductive organs. This condition is caused by relaxation of the muscles and ligaments sustained in the correct position reproductive organ. Whatever the cause of the hysterectomy patients often suffer from urinary incontinence. There is no scientific reports that indicate standards of conduct in this group of patients. However in the available literature lists the results of which confirm the effectiveness of treatment of patients with incontinence due to other causes. The guidelines of the International Society for. Continence clearly indicate that the treatment of urinary incontinence should begin with the application of methods most secure and least invasive. Recent scientific reports underline that belongs to them primarily physiotherapy. Properly selected physiotherapeutic methods result in a significant improvement in, or even complete reduction of symptoms [8,9,14,16].

A. Kruse et al. [7] studied the effectiveness of rehabilitation in 102 patients after hysterectomy with the problem of stress urinary incontinence. We evaluated the effect of treatment on change in quality in terms of incontinence, fatigue and physical function in patients qualified. After the treatment improvement was seen in 41 patients, and 10 deteriorated.

Shen Liu Y SX and [17] in their study included 163 patients who suffered from urinary incontinence due to a history of stroke. Patients were divided into two groups. The research group consisted of 103 participants and performed with them electrostimulation treatment, while the control group of 60 women. After therapy, statistically significant improvement was observed in patients undergoing therapy.

C. Pereira et al. [11] Their observations carried out on a 55-year-old woman with multiple sclerosis, which also had urinary incontinence. Patient underwent 15 treatment electrostimulation of pelvic floor muscles with the pelvic floor muscle training and behavioral therapy. After the treatment has been observed to improve the quality of life patients, strengthening the pelvic floor muscles and reducing the frequency of episodes of urination.

Conclusions

1. The use of electrostimulation of pelvic floor muscles biofeedback reduces the problem of urinary incontinence in a patient after a total hysterectomy
2. The use of electrical stimulation of the pelvic floor biofeedback results in an increase in the rest of bioelectric activity of the pelvic floor muscles
3. Electrical stimulation of the pelvic floor muscle exercises with biofeedback appears to be an effective treatment for urinary incontinence in women after total hysterectomy. Therefore, it seems necessary to continue research and to conduct them on a larger number of patients.

References

1. Bales GT, G. Gerber, T. Minor et al. Effect of preoperative biofeedback / pelvic floor training on continence in men undergoing radical prostatectomy. *Urology* 2000; 56: 627 - 630.
2. Bujanowska - Fedak M., Rex D. pelvic floor muscle exercises in the conservative treatment of women with urinary incontinence - clinical evaluation of the effectiveness and quality of life. *Family Medicine & Primary Care Review* 2006, 8 (4): 1270-1275.
3. Galliac Alanbari S. Reeducation perineal feminine. Training materials pelvic floor muscle re-education. Office Régional de Recherche et d'Enseignement d'en Kinésithérapie 20^{ll} de France - 22.09.2008, Paris, 2008.
4. Gałczyński K. et al. Pelvic floor muscle electrostimulation in the treatment of urinary incontinence in women. *Overview menopausal* 6/2011, 427-43
5. Goode PS Predictors of Treatment Response to Behavioral Therapy and Pharmacotherapy for Urinary Incontinence. *Gastroenterology* 2004: 126: 141 - 145.
6. Kenton K. FitzGerald MP L. Brubaker and Clinican What Is To Do - Believe the Patient or her Urinary Diary? *J Urol* 2006; 176: 633 - 635.
7. A. Kruse et al. Changes in incontinence after hysterectomy. *Arch Gynecol Obstet.* 2017; 296 (4): 783-790.
8. Kroll P., A. Jankowski, Maćkowiak J. Comparative evaluation of the effectiveness of the use of selective alpha - brokers and behavioral therapy in the treatment of abnormal coordination wypieraczowo - zwieraczowej. *Overview of Medicine* 2006; 63 (3): 226 - 228.
9. Mørkved S. because K., Schei B., et al. Pelvic Floor Muscle Training During Pregnancy to Prevent Urinary Incontinence: A Single - Blind Randomized Controlled Trial. *Obstet Gynecol* 2003; 101: 313 - 319.
10. Neumann P .B., Grimmer KA, Y Deenadayalan. Pelvic floor muscle training and adjunctive therapies for the treatment of stress urinary incontinence in women: a systematic review. *BMC Women's Health* 2016 6 (11): 20 - 48.
11. C. Pereira, M. Castiglione, Kasawara K., Effects of physiotherapy treatment for urinary incontinence in patient with multiple sclerosis. *J Phys Ther Sci.* 2017; 29 (7): 1259-1263.
12. Pertyński T., G. Stachowiak menopause as a risk factor for urinary incontinence in women. In: *Urinary incontinence in women - pathology, diagnosis, treatment.* Ed. Rechberger bifolium T., Lublin 2005: 95 - 105.
13. Writer M. Activity of the lower urinary tract in women treated for some gynecological diseases. Dissertation. AM, Poznan 2003.

14. Praisner A urodynamic study in gynecological practice - guidance and criticism in the interpretation of results. *Obstetrics and Gynecology* 2008; 2 (8): 9 - 22.
15. Rechberger T., P. Skorupski Urinary incontinence - the problem of medical, social and social. In: *Urinary incontinence in women - pathology, diagnosis, treatment*. Ed. Rechberger T bifolium, Lublin 2005: 29 - 38.
16. Rohr G., Støvring H., Christensen, K., et al. Characteristics of middle - age and elderly women with urinary incontinence. *Scandinavian Journal of Primary Health Care*, 2005; 23: 203 - 208.
17. Shen SX, Liu Y, A retrospective study of neuromuscular electrical stimulation for treating women with incontinence post-stroke. *Medicine (Baltimore)*. 2018 Jun; 97 (26): e11264
18. Strupińska E. Kinezyterapia in the treatment of women with urinary incontinence. *Urology Poland*. 2008; 61 (1): 23 - 27.
19. Surkot G. Właźlak E. Practical aspects of non-surgical treatment of urinary incontinence in family practice every day. *Guide for GPs in 2007*; 43: 68 - 77