
THERAPEUTIC OPPORTUNITIES OF NON-SURGICAL TREATMENT IN PATIENTS WITH URINARY INCONTINENCE

Galina Mratskova

Department of Medical Rehabilitation and Ergotherapy, Physical Medicine and Sports, Medical Faculty, Trakia University, Stara Zagora, Bulgaria, doc_mratzkova@abv.bg

Rumen Deliev

Department of “Urology”, TRAKIA Hospital, Stara Zagora, Bulgaria, doc_deliev@abv.bg

Abstract: Urinary Incontinence (UI) is a significant medical and social problem which affects both sexes. It can lead to a reduction in social contacts and physical activity, associated with poor self-assessment of the health status, impairment of emotional and mental well-being, reduction of sexual relations and depressive symptomatology. It is a significant reason for lower quality of life. In women, urinary incontinence is more common than in men. There are a number of reasons why urinary incontinence may occur: after surgery in small pelvis, pregnancy, vaginal delivery, hysterectomy, menopause, extreme obesity, chronic cough, constipation, some medications (muscle relaxants, sedative, antihypertensive agents, ACE inhibitors, antiacids) and others. Age factors leads to increased rate of incontinence, which has a large social and financial impact. It reflects the quality of life and it is a significant financial problem, both personal and for the health insurance system.

The purpose of this review article is to investigate the therapeutic opportunities of non-surgical and physiotherapeutic treatment of patients with urinary incontinence.

The treatment of urinary incontinence is strictly individual and depends on the type of incontinence, its severity and the reasons for its occurrence. It can be conservative and operative. The disease often does not progress over time and the conservative therapy is well tolerated, effective and safe. Non-surgical and physiotherapeutic treatment (behavioral therapy, the reduction of body mass, bladder training, lifestyle change, kinesitherapy for the pelvic floor muscles, biofeedback therapy, electrostimulation of skeletal pelvic floor muscles (ES), vaginal cones, mechanical devices, medication therapy, Botulinum toxin therapy) is the first choice and is preferred by most patients and it is well tolerated and effective. The application of physiotherapeutic methods of treatment requires the preparation of an individual rehabilitation program, which must be consistent with rehabilitation potential of the patient. The principles of gradual increase in the type and number of repetitions in therapeutic exercises, the continuity of kinesitherapy and the appropriate combination with electrostimulation procedures of the pelvic floor muscles are applied. It is considered, that the strengthening of the pelvic floor muscles is achieved through three levels of action: increased compression on the urethra, support of the bladder neck and improvement of the coordination of contractions of m. transversus abdominis and pelvic floor muscles. For electrostimulation, devices allowing percutaneous, intravaginal or intrarectal stimulation, usually with biphasic current, and low frequency and optimal intensity allowing painless contraction, are used.

Conclusion: The urinary incontinence (UI) is highly prevalent and causes significant levels of morbidity, especially in women. The treatment for urinary incontinence is strictly individual and depends on the type of incontinence, the severity and the reasons for its occurrence. A stepwise approach treatment is recommended. The disease often does not progress over time, the conservative therapy is well tolerated, effective and safe.

Keywords: Urine Incontinence (UI), Non-surgical treatment UI, Electrostimulation, Therapeutic exercises

INTRODUCTION

Urinary incontinence (UI) is a significant medical and social problem, a major cause of lower quality of life, especially among women [1]. It can lead to a reduction in social contacts and physical activity, associated with poor self-assessment of the health status[2], impairment of emotional and mental well-being, reduction of sexual relations, overall decrease in quality of life [3] and depressive symptomatology[4]. It is often accompanied perineal rash, bedsores, urinary tract infections[5]. Urinary incontinence is more common in females than in males. There are a number of reasons why urinary incontinence can occur [6]. The prevalence of UI in females varies from 13% to 46% of [7,8]. Studies have shown that increasing of age increases the incidence of incontinence [9]. Incontinence has a significant social effect, it reflects the quality of life and it is a significant financial problem, both personal and for the health insurance system. In the United States, direct and indirect costs amount to \$ 19.5 billion annually [10]. The International Continence Society defines urinary incontinence as: "Involuntary loss of urine which is objectively a demonstrable, social, and hygienic problem " [11].

Etiology is multifactorial: after surgery in small pelvis, pregnancy, vaginal delivery, hysterectomy, menopause, extreme obesity, chronic cough, constipation, some medications (muscle relaxants, sedative, antihypertensive agents, ACE inhibitors, antacids) age factors and others.

There are several major types of urinary incontinence:

Stress urinary incontinence (SUI). Incontinence under tension is a condition associated with involuntary urinary discharge with increased intra-abdominal pressure accompanied by weakness of the pelvic floor and sphincter. It is not accompanied by detrusor contraction. As a result, a urine leak occurs without urge for urinating. It is often provoked in daily activities related to physical effort, jumping, sneezing and coughing [12,13].

Imperative urinary incontinence (urge incontinence (UII), overactive bladder OAB). Due to hyperactivity of bladder musculature, it occurs in all ages but increases with age. Patients with overactive bladder receive contractions during bladder filling with urine, leading to frequent urination and urgency [12, 13]. It is sensory and motor - with two subtypes with detrusor instability and detrusor hyperreflexia (spinal cord injury, multiple sclerosis, Parkinson's disease, Alzheimer's disease, etc.). Incontinence from bladder overload. As a result of stretching of the bladder wall, the bladder does not empty completely and the urine is poured in small portions.

Mixed urinary incontinence (MUI) Incontinence associated with urgency, as well as effort, sneezing, or coughing [12,13].

The treatment of urinary incontinence is strictly individual and depends on the type of incontinence, the severity and the reasons for its occurrence. It can be conservative and operative. Non-operative treatment is the first choice and is preferred by most patients. The disease often does not progress over time and the conservative therapy is well tolerated, effective and safe. One of the recommendations of the Health Policy and Research Agency states that "Operative treatment, except in very specific cases, should be considered after the exhaustion of behavioral and pharmacological interventions (1992)" [14] The European Urology Association recommends gradual approach in the treatment of urinary incontinence [15].

The Behavioral therapy is a set of procedures designed to raise patient awareness of his/her illness and to provide him/her with strategies to reduce urinary incontinence through behavioral changes and bladder training (bladder training is particularly suitable for overactive bladder and imperative incontinence). Bladder training has three components: patient awareness, scheduled urination and positive support. For this type of therapy, it is necessary to keep a diary, a controlled optimal intake of fluid, inhibitory techniques and anticholinergic drug therapy. The ultimate goal is to revitalize the bladder and reach a comfortable interval between the micturitions [16].

Lifestyle changes are recommended in patients with stress incontinence and overactive bladder as well as exclusion from diet of foods with irritant effect on bladder, optimal fluid intake, body weight control, regular defecation and smoking cessation [16].

Caffeine has a proven diuretic effect [17] and exacerbates the symptoms in overactive bladder by increasing detrusor pressure [18] and by increasing detrusor activity [19]. The effect is dose-dependent, high caffeine intake (over 400 mg/day) correlates with established urodynamic detrusor overactivity [20]. Although no strong evidence has been found to demonstrate that decreasing of coffee intake leads to increased continence [21].

Excessive fluid intake could worsen symptoms in SUI and OAB, less fluid in the bladder reduces the likelihood of involuntary leakage under physical activity. Extreme limitation of fluid intake results in the formation of more concentrated urine that has an irritant effect on the bladder, influences the frequency and urinary urgency and favors the development of urinary tract infections [22]. The optimum fluid intake varies between 6 and 8 glasses a day or 1500 ml (30 ml/kg of body weight per 24 hours) [23, 24]

A study of geriatric patients proves that constipation directly correlated with SUI [25]. In another study from 2008. Coyne and al [26] have found high levels of constipation in men and women with UII compared to patients without UII. The treatment of obstipation leads to a significant improvement in the symptoms of adult patients in terms of urgency and frequency [27]. It is assumed that constipation and chronic pushing can be a risk factor for the development of incontinence [16].

Obesity is a significant, variable and treatable risk factor for SUI. It potentiates urinary incontinence by increasing intra-abdominal pressure and chronic overload of the pelvic floor muscles [28]. The rapid increase in body mass can also lead to incontinence [29]. Weight gain by 5 to 10 kg in adults older than 18 years increases the risk of UI development by up to 44% and is an independent risk factor [29]. The BMI is also important. The simultaneous increasing of BMI and waist circumference increases the risk of incontinence [30].

The reduction of body mass through diet, physical exercise, behavioral therapy shows a significant reduction in all types of incontinence and especially in stress incontinence [31]. In addition to the above, there is evidence that increased physical activity reduces the risk of SUI [32-34].

Smoking could increase the risk of stress incontinence by increasing cough episodes₃₄ and overactive bladder through increased bladder irritation from nicotine contained in urine and other toxic products. Although there is statistically significant evidence available only for UUI [34], quitting smoking is recommended as a measure to improve the overall health and to reduce the risk of developing a bladder cancer.

The application of physiotherapeutic methods of treatment requires the preparation of an individual rehabilitation program, which must be consistent with rehabilitation potential of the patient. The principles of gradual increase in the type and number of repetitions in therapeutic exercises, the continuity of kinesiotherapy and the appropriate combination with electrostimulation procedures of the pelvic floor muscles are applied.

KINESIOTHERAPY FOR THE PELVIC FLOOR MUSCLES

The strengthening of the skeletal muscularity of the pelvic floor and especially of m. levator ani suggests better urethral closure and support for the small pelvic organs [5]. Kinesiotherapy is in application from mid-20th century when Arnold Kegel's methodology for patients with stress incontinence became popular. Impact is thought to be achieved at three levels: increased compression on the urethra, support of the bladder neck and improvement of the coordination of contractions of m. transversus abdominis and pelvic floor muscles. In case of urgent incontinence, it is assumed that contraction of the pelvic floor muscles leads to inhibition of detrusor muscle contraction [37-39]. The effectiveness of kinesiotherapy in SUI women is determined by the frequency and intensity of physical exercise. Reduction of incontinence is observed in patients with moderate SUI who perform a complex of 15 reps in 8 weeks with contraction lasting from 2 to 4 seconds, 3 series per day [40]. Knack's technique is recommended to prevent involuntary leakage during elevation of intra-abdominal pressure. The patient is trained to contracture the pelvic floor muscles just before and during physical exercise, sneezing and coughing. The maximum effect is achieved not earlier than 5 months of training [40]. The starting position from which the exercises are performed is essential. Fig.1 The exercises start from a relieved starting position with relatively eliminated gravity, through gravity-loaded exercises to exercises on an unstable basis, for example on a Swiss ball [5].

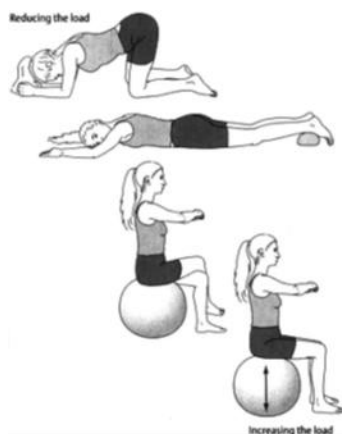


Fig. 1. Exercises with gradually increasing gravitational burden Pregazzi [41]

Biofeedback therapy is especially important from the point of view that the patient must receive information about the right contraction in skeletal pelvic muscle training. The registration of muscle activity is possible through small electrodes located around the anus or intravaginally. The method is important for women who have difficulty understanding, how to contract a muscle or who can not make a contraction [42]. Randomized studies of the efficacy of Biofeedback therapy show an advantage over lack of any therapy and equivalence to drug therapy [43].

ELECTROSTIMULATION OF SKELETAL PELVIC FLOOR MUSCLES (ES)

The physiological objectives of ES are to achieve hypertrophy of skeletal muscularity of the pelvic floor by reflex muscle stimulation, optimization of the reflex activity of the lower urinary tract, and improvement of the muscle blood circulation [44-46]. ES of the pudendal nerve improves the urethral closure by activating the musculature of the pelvic floor. Afferent stimulation of the pudendal and hypogastric nerves leads to reflex inhibition of the pelvic nerve. For electrostimulation, devices allowing percutaneous, intravaginal or intrarectal stimulation, usually with biphasic current, and a frequency of 10-50 Hz and optimal intensity allowing painless contraction, are used [47,48].

A better effect is achieved in patients with stress incontinence and it is recommended a combination of ES with active skeletal muscle pelvic floor exercise.

Vaginal cones. In the treatment of stress urinary incontinence, the training of the skeletal muscle of the pelvic floor is the first treatment tool. Often, patients have difficulty in identifying and controlling these muscles. Intravaginal cones are used to load this group of muscles, and the patient is instructed to retain as long as possible the heaviest possible cone within the vagina. Gradually, more heavier cones are involved. It is believed that this method leads to a faster retraining of the pelvic floor muscles [16].

Mechanical devices. Vaginal pessaries are often used for mechanical support in case of vaginal prolapsis in the treatment of stress incontinence. They are not definitive treatment, do not remove the existing sphincter deficiency, but have few side effects, while progression of the complaints may result in surgical intervention [16]. Urethral plugs are used in cases of pure stress incontinence. They clog the urethra passively and must be removed when emptying the bladder, making them potentially unacceptable for patients [16].

MEDICATION THERAPY

Medication therapy is mainly applied in the treatment of overactive bladder. The bladder innervation is from parasympathetic cholinergic nerves. The acetylcholine, as a mediator, causes a contraction of m. detrusor, via muscarinic receptors predominantly of the M₃ subtype. Muscarinic receptor blocking medications are most commonly used both selective and non-selective. Table 1

Tabl. 1 Anti-muscarinic medications

Medications	Selectivity
Darifenacin	Selective predominant M ₃
Fesoterodin	Non-selective
Oxybutynin	Selective predominant M ₁ /M ₃
Propiverin	Non-selective
Solifenacin	Selective predominant M ₃
Tolterodin	Non-selective
Tropsium	Non-selective

Solifenacin is a new anticholinergic drug, relatively highly selective for muscarinic receptors. Its effect on the bladder is more pronounced than on the salivary glands, leading to a decrease in dry mouth. Treatment starts with 5 mg. once daily and is increased to 10 mg depending on the symptoms and effects. The dose can be adjusted according to the progress of the treatment and according to the needs of the patient. The effect of treatment is felt during the first 1-2 weeks of treatment and is maintained for 12 months.

In the bladder there are also β₃ adrenergic receptors. The first β₃ adrenoreceptor agonist is Mirabegron. It leads to muscle relaxation in the wall of the bladder and thus slows urgency and frequent urination. The therapeutic dose is 50 mg per day, 1 prolonged-release tablet. Appropriate choice in cases of UUI not responding to antimuscarinic therapy

Treatment with estrogens is included in postmenopausal women. Estrogens improve the trophic of the urethral epithelium, help the strength and flexibility of the urethra and vaginal tissues and play an important role for the continent in women.

Duloxetine is a medication that relieves the symptoms of incontinence, but does not cure it. Strengthens the sphincter muscle and reduces the involuntary nerve signals that lead to urinary output. The effects are only temporary and side effects occur when taking the medicine.

Botulinum toxin therapy [6]. Botulinum toxin inhibits bladder contractions by blocking the release of acetylcholine from cholinergic nerves, leading to chemical denervation. Applied in cases of refractory UUI. Injection of botulinum toxin into the bladder wall in endoscopy is considered to be a promising therapeutic method in UUI, but effectiveness is not adequately studied.

CONCLUSION

The urine incontinence (UI) is highly prevalent and causes significant levels of morbidity, especially in women. The treatment for urinary incontinence is strictly individual and depends on the type of incontinence, the severity and the reasons for its occurrence. A stepwise approach treatment is recommended. The disease often does not progress over time, the conservative therapy is well tolerated, effective and safe.

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