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## Research concepts use in the diagnosis and treatment of urinary incontinence

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### Abstract

The phenomenon of urinary incontinence is an important social problem that affects both men and women regardless of age, ethnic or cultural differences. It is estimated that in Poland suffers from this ailment approx. 5 million people and affects women twice as often than men. Furthermore, it has been shown that the incidence and severity of symptoms increases with age. Most recent reports indicate that over 50% of all cases this stress urinary incontinence (SUI), which with the use of suitable diagnostic and therapeutic methods is reversible and treatable. The cause of stress incontinence is to reduce the voltage perineal muscles, pelvic floor relaxation fascia and connective tissue.

Diagnosis of lower urinary tract should be based on intelligence, analysis of micturition diary, physical examination and urodynamic. In recent years, also they started to be used as diagnostic imaging including ultrasound first and foremost. The cheapest and the safest for the patient using the medical treatment and is to this form of therapy, patients should be classified at the beginning. Surgical treatment should be used when conservative treatment will not bring positive results.

**Keywords:** urinary incontinence, physiotherapy, treatment

### Introduction

The phenomenon of urinary incontinence is an important social problem that affects both men and women regardless of age, ethnic or cultural differences. According to the International Society for. Continence is the involuntary leakage of urine caused by the failure of the closing mechanism bladder. The World Health Organization is increasingly determines the condition is a disease of civilization twenty-first century and is considered the basis of modern medicine action to find solutions that will enable a reduction in the number of patients. The symptoms of urinary incontinence (UI) significantly affect the quality of life of patients. Significantly reduce their roles during the activity and social life. This disease causes suffering not only physical but also mental. Sick people usually withdraw from social life and family because they feel embarrassed, moved away and by pointing out society often closed

in on itself. In practice, they are forced to change their lifestyle, reduce social contacts, being in public places, and even changing careers. In effect, this lowers the dignity, self-esteem, social position decline, depression, and anxiety disorders in the field of sexual activity. Unfortunately, patients often are ashamed to reveal their ailments. Mistakenly assume that it is a natural phenomenon, irreversible and closely associated with a history of pregnancy, childbirth or the aging process [1,2,3]. In effect, this lowers the dignity, self-esteem, social position decline, depression, and anxiety disorders in the field of sexual activity. Unfortunately, patients often are ashamed to reveal their ailments. Mistakenly assume that it is a natural phenomenon, irreversible and closely associated with a history of pregnancy, childbirth or the aging process [1,2,3]. In effect, this lowers the dignity, self-esteem, social position decline, depression, and anxiety disorders in the field of sexual activity. Unfortunately, patients often are ashamed to reveal their ailments. Mistakenly assume that it is a natural phenomenon, irreversible and closely associated with a history of pregnancy, childbirth or the aging process [1,2,3].

It is estimated that in Poland suffers from this ailment approx. 5 million people and twice as often as it relates to women than men. Furthermore, it has been shown that the incidence and severity of symptoms increases with age. The problem of urinary incontinence affects approximately 25% of women of childbearing age and 50% of women over 65 years old. Due to the fact that the disease process is closely correlated with pregnancy and childbirth, this phenomenon affects, as many as 65% of pregnant women and about 30% of women in the first year after undergoing childbirth. Most recent reports indicate that over 50% of all cases this stress urinary incontinence (SUI), which with the use of suitable diagnostic and therapeutic methods is reversible and treatable. The cause of stress incontinence is to reduce muscle tension perineum, the pelvic floor, fascia and connective tissue loosening. Other forms of urinary incontinence is the neurogenic incontinence (SUI), urge incontinence (NNM) and the combined form. Unfortunately, despite the fact that the problem of urinary incontinence is so incredibly common, many countries still have not established programs for the prevention, diagnosis and treatment of this disease [4,5].

### **The pathogenesis of urinary incontinence**

Urinary incontinence results in "denervation" muscles that form the pelvic floor. Stress urinary incontinence initially manifested in involuntary loss where urine when coughing, sneezing, laughing, lifting heavy objects, or exercise. In more advanced stages of the disease the appearance of symptoms occurs during a peaceful march, sitting or even lying down. It correlates with the weakening of the pelvic support the wall and an excessive reduction in the bladder neck. It has been shown that patients with SUI occurs impaired nerve impulse conduction between sromowym and the striated sphincter of the urethra. As a result, there is a weakening of the pelvic floor muscles, and loss of function. Urge incontinence manifests itself involuntary loss of urine, which is preceded by feeling of urgency reflex resulting from the presence of the pelvic nerve. This reflex is formed as a response to the increasing volume of the bladder. Moreover, in this group of patients deactivating the fibers coming from the centrifugal hypogastric plexus and hyperactivity centrifugal pelvic fibers, which results in uncontrolled contractions of the detrusor. Form a mixed urinary incontinence, it refers to a group of patients in whom symptoms are characteristic both for patients with stress urinary incontinence and those with urgent urinary incontinence. The etiology and the symptoms of this embodiment are complex and are combinations of all types of urinary incontinence. Unfortunately, both the diagnosis and treatment of this form of NTM is extremely difficult and adapted to the prevailing symptoms [6,7,8,9]. This reflex is formed as a response to the increasing volume of the bladder. Moreover, in this group of patients deactivating the fibers coming from the centrifugal hypogastric plexus and hyperactivity centrifugal pelvic fibers,

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## **Diagnostic**

In the understanding of such a complex phenomenon of incontinence crucial importance is the correct diagnosis. The beginning of the development of diagnosis uroginekologicznej occurred in the late nineteenth and early twentieth century when Howard A. Kelly Johns Hopkins Medical School was first applied to the study of his own design cytoskop with candle light reflecting mirror. From that moment there was a very rapid development urogynaecology, which ultimately led to the creation in 1974 of the International Society for Continence (ICS), which in their reports defines the concepts associated with the

disease, develop recommendations on standards for diagnosis and treatment. Investigations are also assessing the effects of treatment and quality of life of patients [10,11,12].

Diagnosis of lower urinary tract should be based on intelligence, analysis of micturition diary, physical examination and urodynamic. In recent years, also they started to be used as diagnostic imaging including ultrasound primarily [13].

The interview, which is the basis of diagnosis allows to obtain information about any births (number, method of completion, complications or birth weight of the child), surgery, medicines you are taking that may affect the frequency of urination, as well as socio-economic conditions of the patient. On physical examination the investigator should also obtain information on coexisting disorders that cause impairment of the bladder and sphincter. Diseases that cause the occurrence of this problem include: intervertebral discs, spinal cord injury, Parkinson's disease, stroke, multiple sclerosis, diabetes or multiple system atrophy. In women sphincter malfunction it may be caused by operations in and around the vagina and the surgical treatment of incontinence. At the neurological damage of the bladder and sphincter muscles can affect ventrolateral crotch resection of the rectum or hysterectomy. In turn, the reduction in bladder capacity, reducing the susceptibility of the walls, or radiation-induced may affect radiation. A properly conducted interview should also provide information about behaviors and dietary habits, which can exacerbate symptoms and be reversible. To dietary factors mainly include: caffeine, hot spices and a large amount of fluid intake. Among the factors most frequently mentioned psychological stress, fatigue or personality disorders. A valuable complement to the interview questionnaire assessment is the severity of symptoms, which provides information about the circumstances of uncontrolled leakage of urine and the symptoms associated with this phenomenon.

The use of voiding diary or write-clock micturition kept for a minimum of 2-3 days, provides detailed information on the frequency of micturition and the accompanying circumstances, the amount of accepted fluids need to use sanitary pads and their numbers used during the day. A valuable addition to data on the use of incontinence pad test. This study allows the detection and measurement of leakage of urine during a specific time interval. Most given 1 hour or 24-hour test podpaskowy. The test consists in drinking patient given quantity of liquid, and then the performance of a set of classes and the operations to cause urinary incontinence. After a specific time interval is weighed pad and judging the degree of urinary urgency [16,17].

The next step is a comprehensive diagnostic physical examination which should include an assessment of gynecological, urological and neurological. During the test through the vagina to gain information about the statics genital and pelvic floor muscle tension. During neurological assessment is analyzed innervation level segments S2 -S4 and a test is performed sensory skin around the crotch and the vestibule to identify abnormal reflexes. Before performing urodynamic examinations are performed even urine test that allows to exclude the occurrence of urinary tract infection which is a contraindication for the implementation of urodynamic examination. Urodynamic study of objective evaluation of operation of the bladder and urethra, as well as the pathophysiology of the lower urinary tract. In addition, they are made in the treatment of disorders of the urinary tract. It includes a series of tests carried out during uroflomerii, cystometry and urethral profilometry. This test is most often performed in women who have a problem with keeping urine in the bladder. In addition, they are made for patients who have difficulty in emptying the bladder, as well as suffering from neurogenic bladder, recurrent urinary tract infections, vesicoureteral refluxes-and in situations soaking in children. Urodynamic diagnosis is also performed in order to qualify for the treatment of urinary incontinence and the planned kidney transplant. It is also used in states after the failed conservative medical and surgical procedure [18,19,20]. cystometry and urethral profilometry. This test is most often performed in women who have a problem with

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Extremely valuable complement of diagnostic ultrasound evaluation, which can be performed either as a separate study in combination with urodynamics. Technological advances have made the method has become an extremely valuable tool in the diagnosis and monitoring treatment progress incontinence. It allows you to obtain precise and clear images, which are essential in the diagnosis of the type and severity of urinary incontinence. There are two types of ultrasound: an abdominal imaging, which requires a filled bladder and transvaginal method. Both forms allow for accurate evaluation of the functional and anatomical lower section of the urogenital organs [21].

It seems necessary to recognize disorders of the lower urinary tract was comprehensive and was done taking into account all of the above steps. Meeting all the results will make it possible to compare them with each other and place the appropriate diagnosis. The precision diagnostics tool is also necessary to assess the progress of treatment, and therefore also in this regard, it is important not to omit no element of subjective or of the [22].

## **Methods of treatment**

Steady increase in the number of patients with urinary incontinence generates increasing costs associated with treatment and non-medical care. The latest data show that in Sweden, and the United States absorbs the treatment of these patients, up to 2% of the budget spent on health care. The cheapest and the safest for the patient using the medical treatment and is to this form of therapy, patients should be classified at the beginning. Surgical treatment should be used when conservative treatment will not bring positive results. Originally, they are used only in patients with II and III grade incontinence [23].

Conservative treatment should include pharmacological, behavioral therapy and physical therapy. Medical therapy is used both drugs acting locally as well as systemically. Topical therapy primarily relates to the use of oestrogens and alpha-adrenomimetycznych drugs that are designed to cause an increase in tissue turgidity within the vestibule. Topically applied anticholinergics include blocking muscarinic receptors located in the bladder. Prescribed drug in the treatment of stress incontinence is duloxetine, which, by means of central contributes to the inhibition of serotonin reuptake and noradrenaline a result of which leads to increase muscle tone of the urethra, which are innervated by the pudendal nerve.

Regardless of the severity of the disease or the treatment of all forms of adopted people with NTM should begin with changes his lifestyle or behavioral therapy. Obese individuals alone weight control can reduce the severity of symptoms. Often, the beneficial effects are also contributes to limiting the consumption of beverages containing caffeine, alcohol, and soft drinks that affect the occurrence of constipation. Of great importance in the treatment process is to control temporal and quantitative fluid intake and avoiding physical activities, which adversely affect the pelvic floor muscles. Essential is also the training of the bladder, comprising reducing the frequency of visits to the toilet and the control of urination [25].

The most recent scientific reports suggest that the behavior physiotherapy gives a positive result in up to 80% of patients with stage I or stress urinary incontinence mixed form, and in 50% of patients with stage II NTM. In patients with stage III improvement can be achieved in 1/3 patients, however, no less complete disappearance of symptoms is not possible. The pelvic floor muscles are flexible closure abdominal and pelvic. Lowering the tension of these muscles is the cause of serious health problems and sexual. Training these muscles is integral importance for the prevention and treatment of urinary incontinence. These exercises are especially important for people with stage I and II NTM, pelvic organ prolapse or for patients who are pregnant, postpartum and after surgery. The precursor of pelvic floor exercises was an American gynecologist Arnold Kegel. He recommended the use of exercises developed by ourselves already in the first symptoms of urinary incontinence. In 1948, while conducting their research Kegel achieved improvement or cure in up to 84% of patients. Before training, the patient must learn to properly identify and stretch the muscles of the pelvic floor. The most common problem is run abdominal pressure during the contraction instead of the pelvic floor muscles. Extremely useful in this regard may be the use of a vaginal ultrasound or electromyography, which will indicate when the connection is correct. If the patient learns to identify the appropriate muscles is recommended to use these exercises in different starting positions: sitting, standing, walking. Modification may also be subject to the power voltage, time and number of repetitions, and to extend them to various life situations escalating NTM or sneezing, laughing, physical activity. Pelvic floor muscle training should include the maximum tensing of muscles for 5-10 seconds. It is recommended generally to a single patient performed three series of exercises. The daily number of repetitions should be as high as 300 [26].

Inherent in the complex physiotherapy physiotherapy is electrostimulation of pelvic floor muscles using a vaginal probe. It improves blood flow, and additional stimulus to the muscle force produced in the force which is necessary for starting the recovery of the muscle. At the beginning of electrostimulation therapy helps the patient to realize that muscles are involved stretch the pelvic floor. In addition, electrostimulation supports the regeneration of the muscles and nerves and stimulates the micturition centers, which are located in the pons. Literature does not provide specific rules or algorithms in the use of electrical stimulation for the treatment of urinary incontinence. In the literature, there is a huge diversity in the field of applied current, the intensity or the selection electrodes and the place of their application. Most commonly used pulse current mono- or biphasic triangular or rectangular pulse shape. Pulse frequency fluctuates around 15-20 Hz, and the one-shot time should not exceed 200 microseconds, so as not to cause unnecessary reaction soft tissues. The intensity is chosen individually to the patient's feelings. However, it may amount to a maximum of 100 mA. Electrodes placed at a patient's skin in the crotch area, the pubic symphysis and sacrum or vaginally or rectally by using special probes bipolar. Treatment time should be 15-20 min and 10 include a series of treatments should take place every day or every other day [27]. a shot time should not exceed 200 microseconds, so as not to cause unnecessary reaction soft tissues. The intensity is chosen individually to the patient's feelings. However, it may amount to a

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A very valuable addition to electrical stimulation, or treatment is an independent biofeedback, which employs biofeedback operation. This method is based on the realization by the patient's actions not previously aware of, and in the treatment of NTM in the science of conscious contraction and relaxation of the pelvic floor muscles. Biofeedback is a method of fully controlled by the patient, to which a probe of the vaginal serving as the educator and every little sensitive to muscle contraction and an indicator which allows visual inspection of voltage change. The purpose of therapy is to teach the patient the exercise of tension in such a way that the ratio leaned physiological or similar to the normal range. The biggest advantage of biofeedback is that allows you to run the correct muscle group, taking into account the severity and duration of tension and relaxation, as well as an objective observation of the progress of treatment. Biofeedback method is used in patients with uncoordinated movements and contractions in cases of excessive muscle tension or impaired ability to prime the movement in a conscious way. This information is particularly important in the context of Libergall-Wischnitzer, which showed that the effectiveness of exercise decreases with age, and after 45 years of age, only 20% of patients carry them properly. Biofeedback teaches you to modify the function of conscious after receiving the auditory, visual and sensory [28,29]. Biofeedback method is used in patients with uncoordinated movements and contractions in cases of excessive muscle tension or impaired ability to prime the movement in a conscious way. This information is particularly important in the context of Libergall-Wischnitzer, which showed that the effectiveness of exercise decreases with age, and after 45 years of age, only 20% of patients carry them properly. Biofeedback teaches you to modify the function of conscious after receiving the auditory, visual and sensory [28,29]. Biofeedback method is used in patients with uncoordinated movements and contractions in cases of excessive muscle tension or impaired ability to prime the movement in a conscious way. This information is particularly important in the context of Libergall-Wischnitzer, which showed that the effectiveness of exercise decreases with age, and after 45 years of age, only 20% of patients carry them properly. Biofeedback teaches you to modify the function of conscious after receiving the auditory, visual and sensory [28,29]. that the effectiveness of exercise decreases with age, and after 45 years of age, only 20% of patients carry them properly. Biofeedback teaches you to modify the function of conscious after receiving the auditory, visual and sensory [28,29]. that the effectiveness of exercise decreases with age, and after 45 years of age, only 20% of patients carry them properly. Biofeedback teaches you to modify the function of conscious after receiving the auditory, visual and sensory [28,29].

Another modern, yet effective technique which could be used in the treatment of stress urinary incontinence is ultrasound. This method is increasingly being used by physiotherapists in the treatment of various diseases. Using innovative and interdisciplinary method

sonofeedbacku can lead to strengthen the pelvic floor muscles. Ultrasound apparatus can be used to follow the lifting of the bladder neck, which is observable when tensioning the pelvic floor muscles. The patient saw on the monitor displacement occurs when the neck is able to control muscle contraction and relaxation of the pelvic floor. It is certain that sonofeedback is less invasive technique, and if proved to be equally effective, What electrostimulation treatment with biofeedback more patients would prefer this method of treatment. This method is an innovative technology and further studies are needed, which would have shown its effectiveness in the treatment of UI patients [30,31].

Another less frequently used technique because of the large number of contraindications for surgery in the classification of a variable magnetic field. The patient during surgery in a suit sitting on a chair, which is also the source of the magnetic field. The treatment is painless and takes place 2 times a week for 20 minutes. The suggested therapy time is from 5 to 8 weeks [32].

No effect of conservative treatment is the basis to qualify the patient for surgery. Qualification for surgery is preceded by an interview conducted by a gynecologist or urologist and analysis of urodynamic studies and additional. Surgical treatment is usually performed in cases of stress urinary incontinence. The operating method is always selected by the physician on an individual basis for each individual case. Surgical treatment includes over 150 different techniques. Multitude of this proves that there is no perfect and universal method for all. Among the most well-known surgical techniques stands out treatments transabdominal, transvaginal operations using hydraulic loop or sphincter. The gold standard for treatment of urinary incontinence surgery is considered by Burch. This method is known since 1961. However, over the years, underwent numerous modifications. In 1991, he performed the first surgery laparoscopically. This method consists in increasing the bladder neck and for fastening it by means of stitches to the comb-iliac ligament, so that it comes to stabilize the position of the coil. Burch method allows the resolution of involuntary voiding of 68.9 for up to 88% of patients. The recovery period after surgery is between 1-2 weeks for procedures performed laparoscopically and for 2 to 4 weeks for patients undergoing open techniques [33,34]. This method consists in increasing the bladder neck and for fastening it by means of stitches to the comb-iliac ligament, so that it comes to stabilize the position of the coil. Burch method allows the resolution of involuntary voiding of 68.9 for up to 88% of patients. The recovery period after surgery is between 1-2 weeks for procedures performed laparoscopically and for 2 to 4 weeks for patients undergoing open techniques [33,34]. This method consists in increasing the bladder neck and for fastening it by means of stitches to the comb-iliac ligament, so that it comes to stabilize the position of the coil. Burch method allows the resolution of involuntary voiding of 68.9 for up to 88% of patients. The recovery period after surgery is between 1-2 weeks for procedures performed laparoscopically and for 2 to 4 weeks for patients undergoing open techniques [33,34].

## **Conclusion**

Urinary incontinence is a multidisciplinary, because in addition to the medical sphere also applies directly to the social and economic sphere. Recent data indicate that with the increase in the number of older people in society, the phenomenon of urinary incontinence will intensify. Interestingly urinary incontinence in women more often than other lifestyle diseases like diabetes, hypertension or depression. NTM has a negative effect on the quality of life of patients and their entire families. People affected by this problem in the worst stage of the disease forgo social life or sexual isolating themselves in their houses which fall into the depressions. Unfortunately, it often turns out that patients are ashamed to tell your GP about your problem. Often at the beginning they downplay it, and then consider the norm.



According to the data, that only 1/3 of patients take any attempts to treat. Often patients find that the only form of treatment is surgery, and for obvious reasons, are afraid of her surrender. Not me, though it should be considered as a last resort. There are a number of non-invasive methods of physiotherapy, which can reduce the severity of symptoms or lead to a complete cure. [35]

Therefore, it seems necessary to conduct educational campaigns for both society and the medical staff in order to increase awareness of available treatment methods. It is also important to develop standards of physiotherapy in the treatment of NTM, so look for the most effective and least invasive therapeutic methods.

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