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The impact of pregnancy on a woman's health - stress urinary incontinence

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A – study design, B – data collection, C – statistical analysis, D – data interpretation, E – manuscript preparation, F – literature search, G – funds collection.

Abstract

Introduction: Urinary incontinence is an embarrassing problem that affects more and more women. The most common type of incontinence in women is stress urinary incontinence, which is defined as the involuntary loss of urine caused by an abnormal closure of the urethra. It happens most often during exercise, coughing or sneezing. The problem of urinary incontinence is extremely important due to the accompanying impact on the psyche of women. It causes a disturbance of self-esteem and is often a cause of embarrassment before visiting a doctor.

Results: The pathogenesis of urine loss is multifactorial, but in recent times a lot of blame has been placed on the changes taking place in the body during pregnancy and childbirth. Childbirth weakens the pelvic floor muscles, causing temporary or permanent urine loss. The diagnosis of urinary incontinence is based on the basis of a carefully collected medical history, physical examination and additional tests.

Conclusion: Physiotherapeutic procedures, pharmacological treatment and surgical treatment are used as a therapeutic procedures. Prophylactic pelvic floor muscle exercises also play an important role. The most popular treatment for stress urinary incontinence is physiotherapy, including Kegel exercises. The awareness of women about the problem of urinary incontinence should be increased to prevent them from limiting their daily activities and deteriorating sexual activity.

Key words: pregnancy; incontinence; stress incontinence; physiotherapy in urology

Definition and epidemiology

The issue of urinary incontinence is a topic that is more and more widely discussed in the media, despite the fact that it is treated as a shameful ailment, with which patients are often afraid to ask for help. It is a serious medical and social problem as it affects more and more people [1]. According to the International Continence Society (ICS), urinary incontinence is defined as its involuntary loss [2,3]. According to the position of the World Health Organization (WHO) and the International Society of Continuity, urinary incontinence (NTM) is a condition that includes any episode of leakage of urine from the bladder. This means that this problem does not only concern people with constant, urgent, stress urinary incontinence, but also people with at least one such case [4]. It is a problem for both sexes, but it affects more and more women of increasingly younger age. According to statistics, the essence of the problem of urinary incontinence increases with age and affects 10-25% of women over 30 and even $\frac{1}{3}$ of women over 50. According to WHO, 40% of women will experience the problem of urinary incontinence in their lifetime [5, 6].

Postpartum urinary incontinence is a urination disorder with symptoms that begin before, during and after pregnancy [7]. Symptoms of involuntary urine loss also affect 15 to 30% of women in the perinatal period [8].

Unfortunately, the problem of urinary incontinence seems to be underestimated due to the embarrassment of reporting to the doctor. According to a study by Seim et al. as many as 49% of patients seeking help due to leakage of urine have been experiencing this symptom for at least five years [9]. The problem of urinary incontinence does not only concern the individual, but the entire society, and its scale is well illustrated by the amount allocated in Poland for the reimbursement of absorbent funds, e.g. anatomical diapers, diaper pants, which in 2016 amounted to approximately PLN 225 million. This sum is gradually increasing every year [4].

Pathophysiology and risk factors

Urinary incontinence is a symptom that results from functional, structural and hormonal changes in the body. The International Continence Society (ICS) distinguishes five types of urinary incontinence [10].

The first type of urine loss is urgency incontinence. This is the involuntary leakage of urine preceded by a feeling of urgency. Such a situation takes place when the bladder contracts before its filling [11].

Stress urinary incontinence occurs when the mechanism of closing the urethra is disturbed. It is the most common type of urinary incontinence in women. We distinguish three degrees depending on the severity of urine loss:

- 1st degree - caused by a sharp increase in pressure in the abdominal cavity - sneezing, coughing;
- 2nd degree - caused by a moderate increase in pressure in the abdominal cavity - walking up stairs, jumping, light physical activity
- 3rd degree - loss of urine at rest - while lying down and standing [11, 12].

Another type of incontinence is overflow incontinence, which is associated with impaired contractility of the detrusor muscle, which causes the bladder to overflow. Extra-sphincteric incontinence is involuntary urination through a fistula that bypasses the functional mechanism of the urethra. The last type is mixed urinary incontinence, which is leakage associated with urgency and effort. There is also nocturnal enuresis and constant urinary incontinence [10, 13]. There are several factors that contribute to the occurrence of urinary incontinence. One of them is genetics, age, anatomical and neurological factors. Other factors are contributing to the damage to the urinary continence mechanism, which may include childbirth, operations in the pelvic area and the abdominal cavity. The last group are promoting factors, which include improper diet, constipation, and low level of physical activity. Obesity leads to an increase in pressure in the abdominal cavity, which negatively affects the urethra. Incorrect work of the pelvic floor muscles is also influenced by posture defects, incorrect breathing patterns, lack of mobility in the hip and sacroiliac joints, disturbed tension of the pelvic floor, gluteal muscles, trunk and shoulder girdle [8, 10, 14].

The effect of pregnancy on the occurrence of urinary incontinence

During pregnancy, a woman's body undergoes various adaptive changes. One of them are changes in the lower urinary tract. As the uterus continues to expand, intravesical pressure increases, but it is not accompanied by an increase in intraurethral pressure. This condition promotes the appearance of stress urinary incontinence. However, in the majority of patients, symptoms of urinary incontinence resolve spontaneously [15].

Out of the aforementioned factors influencing urinary incontinence, childbirth plays an important role. The greatest risk of damaging the pelvic floor muscles is believed to be in the second stage of labor. It is the part of labor that goes from the full dilation of the cervix to the birth of a newborn. As a result of premature pressure, there is a reflex contraction of the pelvic floor muscles as well as the clamping of the labia, which delays the delivery of the head and thus increases the risk of tissue damage [8].

The risk factors related to childbirth include: high birth weight of the fetus (over 4000 g), deep perineal incision or rupture of the 3rd and 4th degree, obesity of the woman in labor, multiple deliveries and surgical deliveries, e.g. with forceps. The effect of forceps delivery was documented in the course of a study by Meyer et al., which showed that women after forceps delivery showed reduced pelvic floor muscle tone during 10 months after delivery compared to the initial voltage tested 10 weeks after delivery in the same patients [8, 16].

Symptoms and diagnosis

Urinary incontinence has a negative impact on the mental condition, reducing the quality of life of patients. Women with urogynecological problems are more likely to suffer from sleep disorders and depression. They feel anxious, nervous, and fear that they will lose their urine. This leads to a decrease in self-esteem and as a consequence a reduction in interpersonal contacts, professional activity and cessation of physical activity [17].

Urinary incontinence leads to discomfort in everyday life as well as sexual. Leakage of urine during intercourse, pain, lead to the cessation of sexual activity and consequently to deterioration of the relationship with the partner. Patients often hide this problem from their doctor, thus extending the treatment time [6,17].

Incontinence diagnosis is based on differentiating the type of urinary incontinence.

For this purpose, a thorough subject examination is performed. When collecting an interview, attention should be paid to the pelvic operations, the number of deliveries, the presence of comorbidities, medications and dietary habits. Assessment of the voiding diary is also helpful in making a diagnosis. Such a diary should be kept for 7 days and contain information on the amount of fluids consumed or the number of incontinence episodes per day [18]. The physical

examination consists of exercise tests, abdominal muscles and pelvic examinations. One of the tests used in the study of urinary incontinence is the sanitary napkin test. The one-hour test is the most common because the 24-hour variant is difficult to interpret on an outpatient basis. The sanitary napkin test allows to assess the severity of urinary incontinence by comparing the weight of the sanitary napkin obtained before the test to the weight of the sanitary napkin after drinking 500 ml of water and performing activities such as: walking upstairs, bending down, coughing or running in place for an hour [11, 18]. Another of the tests performed is the Bonney test, which consists in urodynamic examination at rest and during exercise. The test consists in measuring the value of intravesical pressure which causes involuntary leakage of urine [12]. In the diagnosis of urinary incontinence, ultrasound is also used as well as microbiological tests in the case of urinary tract infections associated with urine leakage [18].

Non-pharmacological treatment

The safest method of treating urinary incontinence is conservative treatment. It includes pharmacotherapy, kinesiotherapy and physical therapy. Kinesiotherapy is as effective as surgery, but requires more time [1].

Kinesiotherapy consists mainly of exercises that activate the pelvic floor muscles by tightening and then relaxing the muscles of the pelvic area. Performing them regularly improves the structure of damaged muscles, and also increases the volume of fibers [1,5,12]. In order to select the appropriate set of exercises a patient should visit a urogynecological physiotherapist. He will teach the patient how to find the pelvic floor muscles, how to activate them and make them work properly, and will also apply preventive measures in the event that the patient has never had an incontinence incident. The research conducted by D. Kocur on a group of 726 women shows that 80% of respondents knew where the pelvic floor muscles are, 73% knew their functions. However, only half of the surveyed women have ever exercised them. Pelvic floor muscle training acts as a prophylaxis in the fight against urinary incontinence and improves the quality of sexual life [19]. When an incident of urine loss occurs, exercise is used as therapeutic measures [20]. Initially, it is recommended to perform three series of exercises a day, with 8-12 repetitions of contractions in each series. If such exercises bring satisfactory results, their frequency is reduced to 2-3 times a week [1]. There are also active exercises with the use of vaginal cones or balls. Their job is to put resistance on the pelvic floor muscles. This method involves applying pressure and making movements to contract and relax muscles during everyday activities. It is recommended to use vaginal balls or cones twice a day for 15-20 minutes. Along with the increase in the patient's advancement in exercises and her control of holding the weight, heavier devices are selected and additional exercises such as coughing or climbing stairs are recommended [1,12].

Another form of non-pharmacological treatment is physical therapy. The most commonly used methods are electrostimulation and stimulation with a magnetic field. The first one involves the transvaginal application of electrodes, which stimulate the vulva nerve under the influence of impulse, contributing to the reconstruction of the muscles and improvement of their blood supply. On the other hand, stimulation with a magnetic field consists in activating the muscles while sitting on the armchair emitting the field. It is a more comfortable method for patients, because it is not needed to undress for the procedure [5].

Biofeedback is a method which task is to learn to consciously tighten and relax muscles. The patient is connected to an apparatus that shows what changes occur during a given movement. Pessary therapy consists in applying a special pessary in the patient's vagina to prevent urine leakage. It is usually used during the day [21].

Another form of treatment is behavioral therapy, consisting in preventive measures and changing the patient's lifestyle. It is worth paying attention to the correct toilet habits. The patient should be made aware that the toilet should be used when she feels a physiological

need, so as not to perform the pressure movements that weaken the pelvic floor muscles. Voiding diaries help to control the frequency of using the toilet, and gradually increasing the time between micturitions affects the exercise of the bladder muscles. The patient should sit properly on the toilet bowl, the angle between the torso and thighs should be about 35 ° to maintain a correct, upright body posture when sneezing and coughing. Diet also contributes to the prevention of urinary incontinence. Food rich in fiber should be eaten to improve intestinal peristalsis and prevent constipation, because in their case, during defecation, there are pressure movements that weaken the pelvic floor muscles [21,22].

Pharmacological treatment

Pharmacological treatment of stress urinary incontinence focuses on increasing the pressure in the urethra, because patients suffering from this type of urinary incontinence have a lower occlusion pressure in the urethra. The increase in pressure is achieved by acting on the bladder muscle [23].

The first of the described groups of drugs used in the treatment of urinary incontinence are the α -adrenergic agonists - ephedrine and norephedrine. Unfortunately, there are still no studies confirming the effectiveness of the treatment. The risk of these drugs is their lack of selectivity to receptors in the urethra, which may cause an increase in blood pressure, sleep disorders, headaches and cardiac arrhythmias [23].

The next mentioned group of drugs are SNRIs (selective serotonin and noradrenaline uptake inhibitors). Among them, duloxetine has recently found the greatest use. In a study by Cardozo et al. duloxetine showed a reduction of urinary incontinence by 50-60%. Most patients responded to treatment within 5 days. The side effects are usually the main reason for stopping treatment. Nausea is the most typical for the use of duloxetine, and vomiting, constipation, headache, dizziness and insomnia are less common. However, within 2-4 weeks, it was possible to achieve tolerance to side effects of the drug [24,25].

Estrogens are not very often used in treatment. These hormones affect estrogen receptors in the bladder and urethra. They can affect the problem of urinary incontinence by, inter alia, raising urethral resistance and increasing the sensitivity of α -adrenergic receptors, however, according to the latest research, the use of hormone replacement therapy may deteriorate the existing stress urinary incontinence and even predispose to its development in women with previously, there was no problem of urine leakage, therefore it should be used with caution [26,27].

Invasive procedures

About 100 types of surgical procedures have been described in the history of treating stress urinary incontinence in women. In uncomplicated, primary cases of urinary incontinence, burch colposuspension procedures are used. In cases of recurrent urinary incontinence and caused by low pressure in the urethra, sling procedures are most often used, while among older patients, needle suspension techniques are preferred [28].

In order to choose the appropriate method of surgical treatment, numerous factors should be taken into account, such as: the patient's body weight, general health, the will to have children, practicing competitive sports, anatomical relations, urinary tract function and pathologies of the reproductive organ [12].

One of the methods of surgical treatment are procedures with the use of polypropylene tapes. Such operations are now recognized as the standard in the surgical treatment of stress urinary incontinence. T-Sling treatments consist in fixing the tape between the 50-80 percentile of the length of the urethra. This position of the strip is conditioned by the presence of a high pressure zone. Thanks to this location, during the increase in intra-abdominal pressure, the urethra does not move downwards. The advantages of this procedure are its high efficiency -

86% of patients maintain a complete remission of symptoms within 3 years of the procedure, as well as its low invasiveness. The T-Sling procedure is performed under local anesthesia, which allows the patient to be physically activated quickly after it is performed. The importance of this fact was described in the study by Nilsson et al., where as many as 80% of patients were discharged home on the same day after the procedure [28, 29, 30, 31].

Discussion

The birth of a child is a joyful time for a woman, but pregnancy and childbirth can lead to various pathologies. Hormonal changes in the woman's body, the pelvic floor and lower urinary tract, as well as tissue damage during childbirth contribute to urinary incontinence [32].

It is a medical, social, psychological and economic problem. It requires treatment, financial resources for absorbent products and medications. Incontinence leads to limited social contacts, which has a negative impact on the patient's mental state [4,11,17].

It also contributes to the occurrence of difficulties in carrying out everyday activities. The exact number of women with urinary incontinence has not been given, because most women are ashamed of the fact that they are also affected or even do not know that one uncontrolled leakage of urine is called urinary incontinence and delays a visit to a specialist and thus delays treatment. Therefore, their awareness and the whole society should be raised about the importance of this problem and encouraged to take preventive measures in this direction. Exercising is very important in the treatment process, but incidents of loss of urine occur during them, which affects the cessation of exercise by a large number of women. However, faster initiation of treatment results in a faster improvement in the quality of life of patients [6,17].

Conclusion

There are many risk factors for the occurrence of stress urinary incontinence, the most common of which are: age, obesity, previous operations and childbirth. In establishing the diagnosis, an important role is played by a correctly collected interview and evaluation of the voiding diary, as well as additional tests ordered to the patient. Treatment should be individualized to the patient in order to ensure greater effectiveness of the therapy. Performing pelvic floor muscle exercises is the most frequently used method of prevention and conservative treatment of urinary incontinence. Drug treatment requires improvement and more research to increase its effectiveness. The current drug approved for urinary incontinence is duloxetine. Surgical methods are also performed, the standard is the procedure with the use of polypropylene tapes.

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