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Use of Ultrasound Imaging in retraining the plevic-floor muscles of a woman postpartum with urinary incontinence

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Abstract

Pregnancy and childbirth are a recognized risk factor for urinary incontinence in women at a young age. It is suggested that the vaginal delivery is the main factor of this phenomenon due to mechanical damage of the muscle tissue and nerve. Nevertheless, the mere pregnancy can cause hormonal changes, mechanical, leading to urinary incontinence. Postnatal Physiotherapy in Poland is unfortunately often overlooked and underdeveloped area. More and more frequently in the treatment of urinary incontinence treatment uses ultrasound imaging. Using the image on ultrasound in real time, you can watch the work of the muscles. pelvic ultrasound apparatus using a physical therapist teach the patient the specific activation of muscle or group of muscles. Sonofeedback teaching allows motor traffic. This method allows precise identification and appropriate work isolated muscles. An extremely important area of application where there is sonofeedback treatment of patients with urinary incontinence.

Key words: *ultrasoung imaging, urinary incontinence, postpartum physiotherapy*

Introduction

Pregnancy is a unique period in the life of every woman. Although it is a physiological state during its duration in the body of the pregnant leads to changes that affect, among others, on the musculoskeletal system - - skeletal ligament. These anatomical and functional changes are normal for the body of the mother. One of the most important, and certainly the most visible change is the weight gain. In normal conditions should range from 9 to 14 kg [1]. This

phenomenon is caused by the enlargement of the fetus, uterus, or an increase in the amount of amniotic fluid and placenta. The greatest weight gain can be seen in the trunk and it has a place in the second and third trimester of pregnancy. This change, in turn, exerts a strong influence on the abdominal muscles, which are stretched and weakened, which in turn increases the tension within their antagonists. The increase in load in particular at the front of the spine moves the center of gravity forwardly about 2 cm beyond physiological. Weight gain, offset of the center of gravity and weakening of the abdominal muscles predispose pregnant woman to change the posture of the body [2]. The change also affects profiles loosening the tendons and ligaments, and increased mobility in the joints of the pelvis. This is due to growth hormone relaxin in the body of the mother. As a result, the pelvis of woman under the influence of the weight gain is tilted by changing the front axle load of the hip joints. Pregnant, to maintain balance, this mechanism compensates for the tilt rearward, which leads to hiperlordozy lumbar. Unfortunately contractura are iliopsoas and the erector spinae muscles, while the stretch of the gluteal muscle and a simple stomach. The increase in body weight and subconscious intention to regain "balance" by widening the support plane, is carried in addition to the over-burdening the joints of the lower limbs (this may lead to koślawienia flat foot and knee in pregnant) and the joints of the spine [3].

Postpartum physiotherapy

Postnatal Physiotherapy in Poland is unfortunately often overlooked and underdeveloped area. Despite numerous scientific reports to support its effectiveness only in recent years in our country began to form physiotherapy clinics offering support to women during childbirth. The proposed physiotherapy treatments are aimed primarily at reducing the severity of pain and minimize the adverse effects resulting from changes in the body of the pregnant. Many women after childbirth believes that the pain in the spine, groin discomfort or leakage of urine during exercise are natural, and closely associated with a history of pregnancy and childbirth, which is why they do not try to influence the reduction in severity of these processes. Bravely they tolerate these unpleasant symptoms until spontaneously subside. Meanwhile, the latest physiotherapy methods offer many opportunities that allow both to reduce and even prevent the occurrence of adverse effects of pregnancy on the body [4]. Physiotherapy treatments can often be an alternative to surgery or medication. Physiotherapy in women after childbirth should start already on the ward and primarily involve the patient as quickly as possible to run. This will lead to prevent thromboembolic complications resulting from immobilization. In women after giving birth vaginally, it is advisable to run after 4-6 hours. In contrast, patients who were born inresultcaesarean section is recommended to start at the end of the first day. After leaving the unit to turn on therapy exercises that will allow a more flexible abdominal muscles and pelvic floor exercisesstrengtheningweakened paraspinal muscles, as well as breathing exercises and improve the systemic blood circulation. The physiotherapist should also focus on exercises to restore proper posture, which will affect the restoration of biomechanical conditions of pre-pregnancy and will help to reduce back pain [5,6].

Urinary incontinence in pregnant and postpartum women

Pregnancy and childbirth are a recognized risk factor for urinary incontinence in women at a young age. It is suggested that the vaginal delivery is the main factor of this phenomenon due to mechanical damage of the muscle tissue and nerve. Nevertheless, the mere pregnancy can cause hormonal changes, mechanical, leading to urinary incontinence. In the literature there are several reports of which relate to the problem of epidemiology and pathophysiology of [7,8]. Urinary incontinence occurs in 31% of women who gave birth vaginally and in 15% of women who came to give birth by caesarean section. Childbirth

forces of nature causes the neckbladderUrinary during Valsalva maneuver and cough. It has been shown that hypermobility of the bladder neck is strongly associated with stress urinary incontinence and morphological changes in the bladder and bladder neck occurring during pregnancy are shown by means of different imaging techniques [9,10].

Urinary incontinence in a negative impact on physical activity and quality of life of women in pregnancy and childbirth. The main cause of urinary incontinence in the postpartum period is the pudendal nerve damage during childbirth or levator forces of nature. This phenomenon occurs due to wielkoparametrowości, large fetus, childbirthtickElongate second stage of labor or third degree perineal wounds. Moreover, even during the running physiologically birth can cause damage to the nerve [11,12]. Lien et al. Have shown that during the second stage of labor as 15% of the deflection of the pudendal nerve as compared to the initial value [13]. During childbirth can also occur to the optic nerve damage anus. Nevertheless, there are fewer studies on the evaluation of this phenomenon. During labor forces of nature can also occur polyneuropathy, which is the cause of the weakening of the pelvic floor muscles. The integrity and function of the PFM also affect groin injuries that occur during childbirth. Damage to the crotch third and fourth degree of the effect of reducing the capacity to generate force, and the sphincter of the rectum is much more vulnerable to incontinence of urine and stool. Urinary incontinence occurs in as many as 56% of women who developed these disorders [14].

There are scientific reports that confirm that strengthen the pelvic floor muscles reduces the symptoms of stress urinary incontinence. Studies show that a 6-month training pelvic floor muscle strength and increases the maximum strength of the pelvic floor muscles, as well as reducing the severity of symptoms. Other reports have shown that the 3-month training program reduces the number of episodes of SUI 50%. Analysis of existing scientific reports show that there is no data on the specific parameters of training. Unfortunately, the lack of such basic data on the number, frequency and duration of training makes many doctors or physical therapists do not perform this type of training. It is therefore necessary to include further detailed research reports on the treatment parameters and must test these parameters to determine the ideal protocol that can be used to treat patients with stress urinary incontinence [15].

Ultrasonography in the treatment of urinary incontinence

Ultrasound is a valuable tool used by doctors between otherfor diagnostic purposes. Ultrasound pelvic floor muscle training is hardly ever used. Nevertheless, this multidisciplinary and novel technique can also be an effective tool in the treatment of patients with stress urinary incontinence [16].

Using the image on ultrasound in real time, you can watch the work of the muscles. Using the camera to ultrasound physiotherapist teaches the patient activation of specific muscle or group of muscles. This modern method of work is defined as sonofeedback and gaining more and more interest physiotherapists in the treatment of various diseases [17].

Sonofeedback teaching allows motor traffic. This method allows precise identification and appropriate work isolated muscles. An extremely important area of application where there is sonofeedback treatment of patients with urinary incontinence. Ultrasound can not only correct and accurate assessment or to measure, but mainly for conducting therapy based on biological feedback each time a patient 30 minutes before training must drink at least 500 ml of water to the training took place with a full bladder and thus changes visible on the screen more visible [18].

To train the pelvic floor muscles are most commonly used two methods of observation changes. Transabdominal or transperineal technique. There is no scientific reports that porównywały the effectiveness of both techniques. So they are applied equally. In both

cases, the training is performed in the supine position with hips flexed and head resting on cushions. The purest movement of the bladder wall during a pelvic muscle contraction was observed when the angle from the vertical toward the cephalic was 15 to 30 degrees. For transabdominal ultrasound transducer is placed in the middleline lower parts belly. During transperineal ultrasound, and the ultrasound transducer is placed in the midline of the perineum, in the sagittal plane, after covering it with ultrasound gel followed my nonpowdered by a surgical glove or plastic wrap Reasons for hygienic, and further Top gel. In order to assess may also be useful slit labia [19,20].

If you perform sonofeedbacku transabdominal technique proves the correctness of training observed in the ultrasound monitor the displacement of the base of the bladder. It is considered correct displacement of 8.96 - 9.31 mm (measurement error 0,22-0,57 mm) in the sagittal plane, and 7.51 - 8.43 mm (measurement error 0,28-0,44 mm) transverse plane. This change is indicated on Figure 1. The translation vector [21].



Figure 1. Transabdominal ultrasound images of pelvic floor at rest (A) and at maximum contraction (B).

When used techniques transperineal to be correctly executed practice be considered to be, during which the monitor camera can be seen moving the urethra upward, and the angle between the connection he bladder neck and proximal urethra, the anorectal angle (ARA), as well as the pubic symphysis, Which serves as a fixed landmark bills from Which measurements can be made. Assessment points are marked on Figure 2 [22].

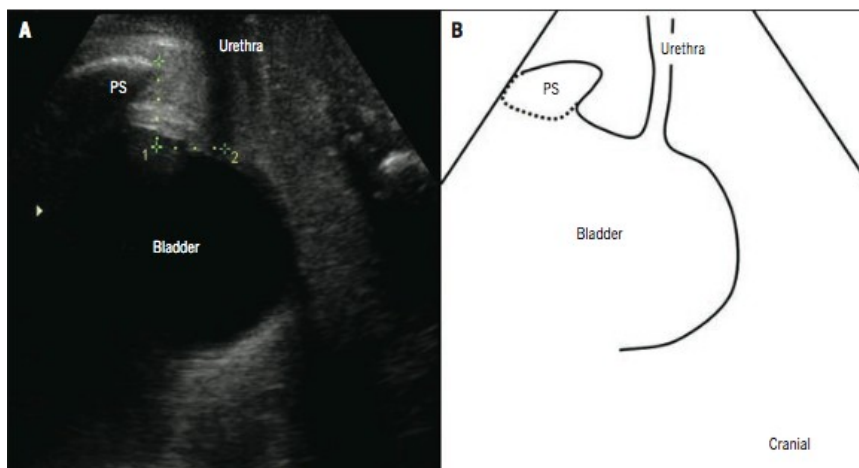


Figure 2. Transperineal ultrasound image of the bladder (A) and labeled transperineal outline of the image (B).

Sonofeedback, which allows the presentation of changes of the pelvic floor muscles during exercise is a valuable source of information for therapists and patients. This method is a tool for re-education of the pelvic floor muscles and thus a new form of treatment for stress urinary incontinence. These types of workouts are recommended above all those who have problems with proper execution of shrinkage have altered neuromuscular control or weakened, wounded or swollen muscles of the pelvic floor. Use of a source of ultrasound imaging using biofeedback and thus a relatively new method. However appear at first reports research, which compare this technique with traditional biofeedback training performed through the use of EMG. The technique sonofeedbacku in these reports, it appears that generating favorable results. Nevertheless, the number of reports on the subject is too small, so further research is needed, and a meta-analysis to develop standards for the treatment of patients with SUI [23,24].

Conclusion

Ultrasound imaging is a valuable tool in the treatment of stress urinary incontinence. It is confirmed that this method enhances the weakened pelvic floor muscles and thereby reduces the symptoms of SUI. Despite many reasons, but there is no scientific reports that confirm the efficacy of this method in women in the postnatal period. Therefore, it seems necessary to develop a precise model of training and performing it in this group of patients. It may be useful as a comparative assessment of the methods used so far.

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