

A Multi-Disciplinary Perspective on the Diagnosis and Treatment of Urinary Incontinence in Young Women

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1. Introduction

Urinary incontinence (UI) has a multifactorial etiology, and as a rule lasts for many years (Abrams et al., 2002; Milart & Gulanowska-Gędek, 2002; Rechberger & Skorupski, 2005). It is most commonly seen in women (Foldspang & Mommsen, 1997; Rechberger, 2004; Rechberger & Skorupski, 2005; Garstka-Namysł, 2006, 2009). According to a recent epidemiological study (Minnasian, 2003), in a population of 230,000 people, the frequency of occurrence of UI was approximately 27.6% among women, as opposed to 10% among men. It is estimated that about 3% of men between the ages of 15 and 64 have UI-related problems, as compared to 7-10% of men over 64 (Evans, 2005). The prevalence of UI in women is likewise dependent on age: it affects nearly one-third of all women before menopause and over 45% after (Rogers et al., 2001a, 2001b). A detailed analysis of the occurrence of UI in various age brackets indicates that it affects 25% of women under 18, 18% under 29, and 37% between 35 and 54, whereas 39% of women with UI are over 55 years old (Bø, 2004). However, approximately 70-80% of women over 65 have UI (Milsom et al., 1993, 2001; Hannestad et al., 2000; Nygaard et al., 2003, 2004). This has been confirmed by several studies (cf. Diokno et al., 2004; Hunskaar et al., 2004; Furelly et al., 2003; Kirby et al., 2006; Rechberger & Tomaszewski, 2007).

On the basis of separate studies, sponsored by the National Association for Incontinence in the United States, it can be inferred that, among all diseases of social significance, UI is the most common. While 21% of American women suffer from arterial hypertension, 20% have depression, and 9% have diabetes, as many as 30% of women have UI (Resnick, 1998;

Broome, 2003). As mentioned earlier, it is estimated that the statistics are similar for European countries (Hunnskaar et al., 2002). Since UI affects much more than 5% of the population, and has a significant impact on personal, family, and vocational functioning, it is considered a disease of social significance (Cioskowska-Paluch, 2000; Adamiak & Rechberger, 2005; Bidzan, 2008).

The spectrum of psychological problems associated with the symptoms of UI is particularly broad when the disease is at an advanced stage (Lagro-Janssen et al., 1992a, 1992b). Lalos et al. (2001) found that the life of persons with UI undergoes a diametrical change, which affects many aspects of life:

1. The manner and style of family life is changed, as is sexual activity (cf. Norton et al., 1988). As many as 25% of female patients experience some urine emission during sexual intercourse, while 35% have difficulties achieving orgasm (Veerecken, 1989). Moreover, UI can be a drain on the family budget, due to expenses entailed in treating and mitigating the symptoms (sanitary pads, diaper-panties, etc.).
2. Career plans are changed, vocational opportunities are limited, and sometimes it is impossible to work outside the home.
3. Social life (including quality of life, QOL) is impaired, with the loss of good social functioning and limitations on social contacts (cf. Brown et al., 1998a; Wein & Rovner, 1999; Anders, 2000; Thom, 2000; Tołłoczko, 2002; Smutek et al., 2004a; Bidzan et al., 2005a,b; Garstka-Namysl et al., 2007, 2008). It is estimated that ca. 35% of persons with UI are on disability pension, where one of the main reasons for an adjudication of disability is the significant degree of incontinence and the concomitant inability to maintain a job. This can cause a feeling of reduced self-worth, a loss of social position, a deterioration of mood, and social isolation, all of which serve to reduce subjective QOL (Norton et al., 1988).

For many patients UI continues to be shameful and stigmatizing; it may well be the “last taboo of the 21st century” (Roe & May, 1999; Thom, 2000; Bidzan, Smutek & Bidzan, 2005b). Treatment outcomes in UI, though systematically improving, are still unsatisfactory: there is too high a percentage of relapse, an insufficient understanding of the reasons for treatment failure, and non-compliance with recommended therapy. This has led to increasing interest in a multi-disciplinary approach to UI, in which the process of diagnosing and treating UI involves the joint efforts of urologists and uro-gynecologists with clinical psychologists, psychiatrists, neurologists and physiotherapists.

Psychological research to date has concentrated on the psychopathology of persons with UI, especially depression (Veerecken, 1989; Lew-Starowicz, 2002; Chiverton et al., 1996; Valvanne et al., 1996; Kinn & Zaar, 1998; Bodden-Heidrich et al., 1999; Zorn et al., 1999; Dugan et al., 2000; Watson et al., 2000; Zajda et al., 2000; Fultz & Herzog, 2001; Meade-D’Alisera et al., 2001; Broome, 2003; Nuotio et al., 2003; Nygaard et al., 2003; Bodden-Heidrich, 2004; Perry et al., 2006), anxiety, and mental discomfort (Chiara et al., 1998; Watson et al., 2000; Libalová et al., 2001; Bogner et al., 2002; Bogner & Gallo, 2002; Perry et al., 2006), as well as the impact of psychosocial factors on the course of UI, the coping methods used by patients, and treatment outcomes (Sand et al., 1999; Thom, 2000; Janssen et al., 2001; Shaw, 2001; Miller & Hoffman, 2006; Sand & Appell, 2006; Bidzan, 2008). In recent years many researchers have focused on the evaluation of Health Related Quality of Life (HRQOL) in persons with UI, including their psychosocial functioning, broadly understood

(Sutherst & Brown, 1980; Norton, 1982; Norton et al., 1988; Grimby et al., 1993; Grimby et al., 1997; Samuelsson et al., 1997; Wyman et al., 1997; Wyman, 1998; Chiarelli et al., 1999; Kelleher et al., 1997; Swithinbank & Abrams, 1999; Brown et al., 1999; Coyne et al., 2000; Kelleher, 2000; Coyne et al., 2003; Fultz & Herzog, 2001; Badia et al., 2004; Currie et al., 2006; Bidzan, 2008; Bidzan, 2011). It should be emphasized in this context that the evaluation of HRQOL has become in recent times the most important diagnostic and prognostic index for the functioning of patients, regardless of the disease (Majkowicz et al., 1997; Brown et al., 1999a; Swithinbank & Abrams, 1999; Woodman et al., 2001), and is recommended by the International Continence Society (Abrams et al., 2002; Williams, 2004).

The analyses performed to date have dealt with particular types and degrees of clinical intensity of UI, as well as particular symptoms (e.g. UI during intercourse) before and after the application of various treatment methods (Sutherst, 1979; Lamm et al., 1986; Hilton, 1988; Lagro-Janssen et al., 1992b; Samuelsson et al., 1997; DuBeau et al., 1998; Robinson et al., 1998; Temml et al., 2000; Carcamo & Lledo, 2001; Fultz & Herzog, 2001; Hägglund et al., 2001; Scarpero et al., 2003; Abrams, 2003; Bidzan et al., 2006a, 2006b; Skrzypulec et al., 2006; Bidzan, Smutek & Bidzan, 2010). Most of this research has pointed to a connection between the variable assessed by the psychologist and those assessed by the physician, although there have been differing conclusions as to the strength of these dependencies. New possibilities are emerging for psychotherapeutic intervention, and the opportunity now exists to improve the outcome of complex, holistic treatment. It should be noted, however, that research on these connections among younger women (in the 18-34 age bracket) is relatively scant (Debus-Thiede & Dimpfl, 1993; Dugan et al., 1998; Fultz & Herzog, 2001; Hägglund et al., 2001; Shaw et al., 2001; Papanicolau et al., 2005). Attention has been drawn to the fact that the consequences of UI in younger patients are more visible than in older persons (Debus-Thiede & Dimpfl, 1993; Dugan et al., 1998; Fultz & Herzog, 2001; Hägglund et al., 2001; Shaw et al., 2001; Papanicolau et al., 2005). This may be associated with the fact that difficulties in retaining urine are generally ascribed to aging, and are perceived as a typical complaint in the elderly (Dowd, 1991; Bush et al., 2001; Dugan et al., 2001; Davey 1993). A state that is perceived as being normal is less often treated, either by public opinion or by the persons involved, as exerting a negative impact on emotional and social functioning, than when the same state is perceived as a deviation from the norm. Moreover, both the lifestyle and the range of obligations (family duties, vocational responsibilities) change with age, a fact which may support greater adaptation to UI in older persons than in younger (Umlauf et al., 1996).

In this chapter, based on the results of earlier research, we would like to draw attention to the particular nature of the conditions surrounding UI in young women, and to advocate a multi-disciplinary approach (gynecology, urology, psychology, psychiatry, and physiotherapy) at every stage of the diagnosis and treatment of persons with UI. Based on our own experience with functional research on the lower urinary tract and the pelvic floor in a group of female patients reporting problems with urination, we shall present the most common discrepancies in the evaluation of the causes and the indications for treatment of UI.

All these discrepancies may occur even in patients with correctly performed standard diagnostic tests, because the latter are not always enough to reveal disturbances of functional origin. We discuss three diagnostic problems that in our opinion are most often encountered, and propose optimum solutions.

2. Low urethral pressure or abnormal urethra function

Our clinical observations suggest that as early as the preliminary patient history an awareness of the dependencies between the mental sphere and UI can enable the physician to avoid committing diagnostic errors and applying ineffective treatment methods. Particular striking were the discrepancies regarding young women (18-34 years old in our patients) treated with a diagnosis of high urethral pressure, with concomitant UI of greater or lesser intensity and disturbances of micturition. In our urodynamic clinic, we see a large number of patients previously treated surgically by urethral dilatation due to a diagnosis of high urethral pressure, and urodynamically normal detrusor profile. In many cases, however, the initial psychological interview, including a psychosexual biography (Bidzan, Smutek & Bidzan, 2010), suggested that the micturition disturbances might have existed since childhood. A questionnaire we have developed helped us to discover that these patients had frequently repressed from consciousness their memories of UI and bedwetting in childhood and youth, and in filling out the standard questionnaires had often denied that any such thing had occurred (or they had never been asked). They most often associated the onset of their complaints with childbirth or a bladder infection in childhood or adolescence. A detailed patient history (lack of neurological disorders), palpation of perineal muscles, an evaluation of muscle contraction in the pelvic floor and the state of conscious control of these muscles by surface electromyography, and a functional evaluation of the pelvic floor muscles using a transperineal ultrasonogram, along with data from the psychosexual biography, pointed to a diametrically different diagnosis even before urodynamic testing.

The majority of the symptoms reported by these patients (recurring urinary infections, episodic urinary retention, urinary incontinence, assisting urination by abdominal pressing, with a urodynamic image typical for a sub-vesical obstruction or disorders of sphincter-detrusor coordination) were caused by a state of permanent contraction (possible since childhood) of the pelvic floor muscles (Figures 1a,b). This mechanism, used sub-consciously for years to defend against UI and the feeling of the urge to urinate, makes it impossible for the pelvic floor muscles to relax normally, which is essential for unhampered urination. It should be emphasized that the inflow of urine to the upper urethra with low or dysfunctional pressure at moments of reduced urethral pressure can evoke the urinary reflex, which our patients (with urodynamically normal detrusor function) refer to as "sudden urges." The constant maintenance of increased muscle tone can cause not only difficulties with initiating voiding, but also overfilling, which gives a clinical picture of bladder outlet obstruction. The lack of normal relaxation of the pelvic floor muscles in virtually the entire group of patients with chronic low urethral pressure, and in those with abnormal changes in urethral closure pressure, definitely hampered sexual initiation, the maintenance of sexual activity satisfying for both partners, and the establishment of a lasting relationship, and for many patients caused constant discomfort in the urogenital region. These patients assessed their HRQOL much lower. During the first visit, after a patient history has been taken and the questionnaire developed by our team has been filled out, the patients are informed about the possible genesis of the problem, and they are taught to relax the pelvic floor muscles during palpation and a transperineal ultrasonogram in standing position, with visualization of muscle activity on the screen. Those patients who had trouble with mastering conscious muscle relaxation additionally benefited from EMG biofeedback exercises with a vaginal electrode. As a rule, during the uroflow testing

towards the end of the first visit, the women voided their bladders without abdominal pressing, with normal flow and without retention, or, in the case of abnormal urethra function, with a wavy curve but without urinary retention. Urodynamic testing, including profilometry (performed 2-3 weeks after the first visit), with relaxed pelvic floor muscles, confirmed the suspicion of low urethral closure pressure (P clos max oscillated from 25 – 35 cm H₂O), or abnormal urethra function. We were able to discover in the same patients during the first visit, that the P clos max could reach 80 or 120 cm H₂O, if the patient were maintaining the pelvic floor muscles in constant tension.

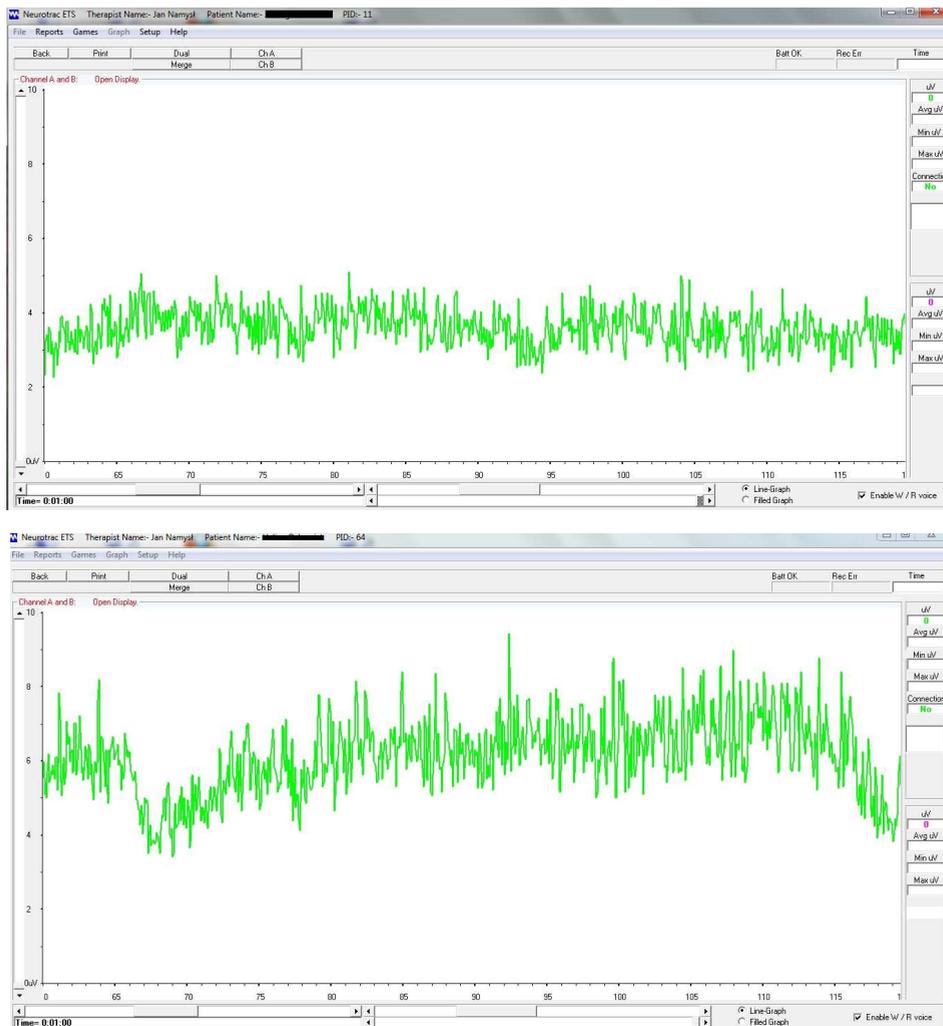


Fig. 1 a,b. EMG recordings of perineal muscle resting tone made in supine position with Veriprobe® vaginal probe and MyoPlus® EMG unit (Verity Medical Ltd) from different patients with increased muscle resting tone. Source: authors' own examinations.

This explains why in some previous investigations these women had been diagnosed with high urethral pressure. Most likely, when the previous urodynamic testing had been done without prior training in muscles relaxation with visualization of muscle function, these women had not relaxed the pelvic floor muscles even for a moment (first of all, they were unaware of the problem). The increased resting tone in the pelvic floor muscles, or slight muscle tone changes during the various phases of urodynamic testing, could lead to an incorrect diagnosis, despite the EMG record from the skin electrodes, which results from the limitations of this method of registration.

The great majority of patients in this group reported, that after the first visit (complying with our recommendations), they had fewer disturbances of voiding and recurrent infections. Some of them, who had periodic episodes of UI, decided on rehabilitation with electrical muscle stimulation (EMS) and EMG biofeedback therapy, or surgical treatment with sling procedures for better urethral support, supplemented by post-operative rehabilitation.

3. Reduced bladder sensation and increased bladder functional capacity

This same mechanism (many years of maintaining increased resting tone in the pelvic floor muscles) may also be developed by female patients whose bladders have increased functional capacity, with a weakened feeling of bladder fullness and urination reflex, and urethra with normal closing pressure. Just as in the group of patients with chronic low-pressure urethra or abnormal urethral pressure, these patients were unaware of the abnormal reactions involved in voiding, and had repressed any memories of involuntary micturition or bedwetting (due to overfilling) in childhood or adolescence. They most often associated the onset of symptoms with the most dramatic medical event in their childhood or adolescence (hospitalization for a urinary tract infection, or for difficulties in urinating), or the beginning of sexual intercourse, or with childbirth. When we suggested that the patients collect a history of their urinary disorders from their parents, it became possible during the next visit to confirm that episodes of UI, voiding problems, or urinary tract infections had occurred with varying intensity since childhood, and/or had occurred much more often than these women had reported during the first visit. Maintaining the pelvic floor muscles in a state of increased resting tone for many years had limited the number of episodes of UI due to overfilling, while the unconscious or sometimes recommended abdominal pressing had prevented undue urinary retention. It was only weakening or damage in the mechanisms of retaining urine, most often postnatal or iatrogenic, resulting from bladder emptying using the abdominal press, that over time had reduced the effectiveness of the mechanism used since childhood to cope with this form of voiding disorder. Static disturbances (whether postnatal or caused by other factors, such as changes in the posture of the pelvis, cf. Nguen 2000), regardless of the congenital weakening of the urinary reflex and the increased capacity of the bladder, can reveal congenital voiding disorders, previously masked by the defense mechanisms.

When there are no static disturbances, however, the unconscious use of abdominal pressing to support urination since childhood, due to constantly contracted muscles and a weakened urination reflex, has usually been rather effective in preventing urine retention and frequent infections. The strategy of behavior and ways of coping with bladder emptying, maintained

over many years, give the patient a false sense of being in good health, and make it difficult to establish the cause-and-effect relationship of psychosomatic factors. Along with the appearance of static disturbances (e.g. due to childbirth or disturbances in the innervation of the pelvic floor muscles due to discopathy), the previous mechanism for voiding an overfilled bladder and reducing urine retention ceases to be effective, and difficulties with urination intensify. They are caused by the exacerbation of deformities (folding of the urethra), along with prolapse of the anterior vaginal wall when the effort is made to assist urination by abdominal pressing. In these patients, just as was the case in the group of patients with congenitally low or abnormal urethral pressure and with a normally sensitive and properly innervated bladder of the correct volume and an active urination reflex, there is an identical defense mechanism, i.e. permanently increased resting tone in the pelvic floor muscles. This mechanism is likewise the cause of psychosexual disturbances and a worse HRQOL. The lack of a diagnosis reached early enough using surface electromyography with vaginal electrode (or rectal electrode in children), produces a similar history of largely ineffective treatment. Unfortunately, some physicians still do not have the possibility to make an objective evaluation of the rest tone in the pelvic floor muscles with surface electromyography.

4. Underactive detrusor, bladder with increased cystometric capacity and underactive urination reflex

The patients with long standing underactive detrusor and a weakened urination reflex were subjected to the same diagnostic procedures as the first two groups, and were taught to relax the pelvic floor muscles. The effect of the proposed treatment, education, and exercises was particularly spectacular in this group, since after we had taught them to urinate with relaxation of the pelvic floor muscles and referred them for rehabilitation of the pelvis in cases where the disturbances were severe, further treatment was no longer necessary, and the symptoms of urinary dysfunction did not recur. The EMG recordings of perineal muscles resting tone done with vaginal probe were much lower than in patients without rehabilitation (Figs. 2a,b).

Since the patients in this group had normal urethral closure pressure, there was no UI. If we found disturbances of statics and functional mechanisms producing a tendency to UI due to overfilling, e.g. kinking of the urethra, with reduction of hernia, we referred the patient for appropriate surgical treatment, supplemented by rehabilitation process.

5. Discussion

If we accept the criteria for the classification of dysfunctions of the lower urinary tract in the three groups of patients under discussion here, i.e. low urethral pressure/normal detrusor, abnormal urethral pressure/normal detrusor, and normal urethral pressure/underactive detrusor with increased capacity, the dysfunction was sufficiently mild and the defense mechanisms used sufficiently effective that the patients had not sought specialist medical care until additional factors had appeared, such as childbirth, reducing their ability to retain or pass urine. Ordinary medical care had been more oriented to symptomatic diagnosis and treatment. The complicated mechanisms underlying the appearance and development of UI and the broad background of psychosomatic conditions require adequate diagnostics and a thorough investigation of the etiopathology of pelvic floor muscle dysfunction, the absence of which retards properly targeted treatment and the choice of appropriate prevention methods.

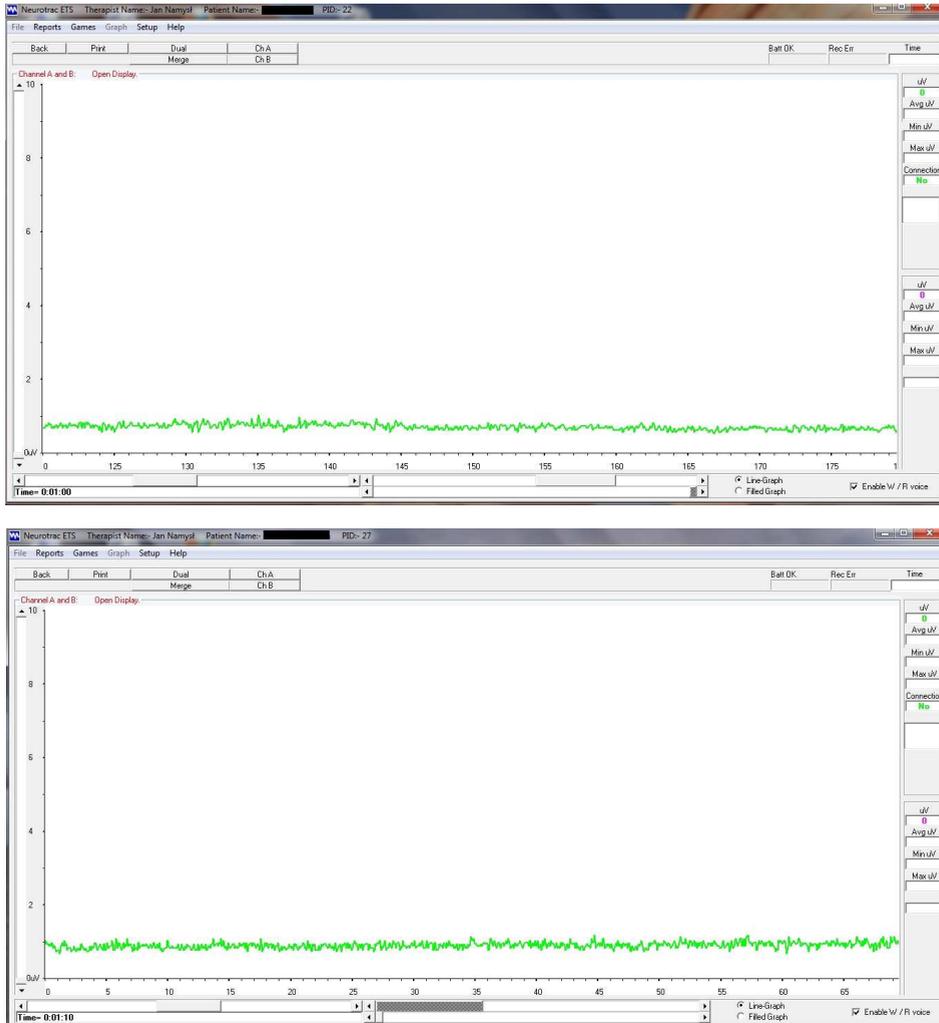


Fig. 2. a,bEMG recordings of perineal muscle resting tone made in supine position with Veriprobe® vaginal probe and MyoPlus® EMG unit (Verity Medical Ltd) from different patients. A previously increased muscle resting tone tends to normalize after 8 weeks of rehabilitation using EMG biofeedback and functional electrostimulation. Source: authors' own examinations.

It is generally known that UI and urinary dysfunctions in childhood and adolescence are difficult medical problems in young women, though relatively rare, occurring less often than in adult women (Bø, 2004). The statistical data cover children and adolescents registered in medical facilities, with symptoms of the most severe urinary dysfunctions, primarily as a result of congenital defects of the spine and lower urinary tract. Milder (sub-clinical) and probably much more common disturbances remain undiagnosed, and thus

they are mostly treated symptomatically. Years later, they are often diagnosed as the generally familiar risk factors in later phases of the life cycle: age, childbirth, overweight, genetic predispositions (Minassian et al., 2003; Nygaard et al., 2003; Rechberger & Skorupski, 2005). It would appear that the actual frequency of these dysfunctions in girls and young women may be much higher.

Among the essential factors producing the low rate of early diagnosis of dysfunctions in the lower urinary tract in girls are the lack of access to specialists who comprehend the complicated mechanisms for retaining and passing urine, the inadequacy of knowledge among pediatricians in respect to the diversity of urinary dysfunctions, and the lack of education for parents in respect to observing behaviors or abnormalities associated with bladder emptying in children. In our opinion, reliable scientific research on a representative sample would allow us to identify the needs and the principles for education and screening, in order to achieve earlier diagnosis and treatment of urinary dysfunctions in girls and young women. Like most authors, we believe that this results from the broad spectrum of personal variability and the functional norms generally accepted for the functional parameters, which do not entail specifying the normal resting tone of the pelvic floor muscles.

The constant maintenance of the pelvic floor muscles in increased resting tone is generally speaking one of the basic ways of coping with the problem of UI and severe static disorders. It is natural that, if only the muscles of the bladder and pelvis are not partially denervated or significantly weakened, a woman feels the degree of bladder fullness and the changes in intraabdominal pressure. Normal innervation of the lower urinary tract and normal muscle strength enable the autonomically controlled reactions of flexing the pelvis in response to a full bladder or increased intraabdominal pressure. In the case of the dysfunctions under discussion here, the conscious contraction of the pelvic floor muscles can facilitate the retention of urine in the collection phase and during exertion in all the basic types of UI seen in adult women (stress incontinence, urge urinary incontinence, and mixed). When this way of coping is maintained for many years (though often unconsciously, or consciously concealed by the patient), it is at least in part, along with neurogenic causes and disturbances of statics (postnatal, post-traumatic, spinal diseases, etc.) the cause of urinary dysfunctions, urine retention and recurrent infections. It can also lead to chronic constipation, difficulties with bowel movements, and fecal incontinence (Namysł & Garstka-Namysł, 2011). If squeezing the pelvic muscles has been the main reason for urinary dysfunction or discomfort in the urogenital region, once the patient has been made aware of the causes of her symptoms and taught to relax these muscles, spectacular treatment effects can be achieved: resolution of UI symptoms, and improved quality of sexual life, partner relations, and HRQOL in a very short time after the patient becomes aware of the reasons for the symptoms and rehabilitation has been implemented.

If functional testing of the pelvic floor muscles using surface electromyography confirms a neurogenic component, there are indications for implementing functional electrostimulation procedures with a neuroregenerative effect (Namysł & Garstka-Namysł, 2011). Expanding diagnostics with non-invasive surface electromyography, performed, depending on the subject's age, with rectal electrode in children, or (in women who have undergone sexual initiation) with a vaginal electrode, would facilitate early detection of increased muscle resting tone in the pelvic floor. Also, appropriately constructed psychological instruments at

the preliminary interview stage (including a brief psychosexual biography, focused on the problems associated with UI), would help us change the treatment plan to obtain good outcomes in the large group of female patients previously diagnosed with, and unsuccessfully treated for, high urethral pressure. Thus the application in the diagnostic algorithm of the evaluation of the occurrence and intensity of the interaction (rather typical, as it seems at the present state of our knowledge) between the development of UI and urinary dysfunctions with mental functioning, facilitates the differentiation of risk groups among young female patients in the case of even a routine visit for recurrent lower urinary tract infections or sporadic episodes of UI (Bidzan, Smutek & Bidzan, 2010).

The awareness of these facts will help us avoid diagnostic errors, choose an appropriate therapy, and make use of multi-disciplinary interventions, including psychological help, or psychiatric help and rehabilitation in cases where it is needed.

6. Conclusions

These observations from our daily clinical practice point to the essential role of cooperation between urologists and a broad gamut of other specialists, especially uro-gynecologists, clinical psychologists, physiotherapists, and psychiatrists, in relation to patients in whom, despite several months of treatment, there are frequent relapses. They also make us aware of the need for physicians to expand their knowledge in the area of psychological factors associated with lower urinary tract symptoms and the holistic approach to treatment. And finally, they can also be a contribution to the ongoing discussion on the methodology of performing urodynamic tests (using profilometry), the need to apply surface electromyography of the pelvic floor muscles, acknowledged by numerous authors to be very useful (Garstka-Namysł, 2006, 2009; Garstka-Namysł et al., 2007, 2008), and the need to create multi-disciplinary teams and highly specialized centers for the diagnosis and therapy of urine retention disorders.

The lack of relaxation in the constantly contracted muscles of the pelvic floor can significantly impede a correct urodynamic diagnosis and cause a misdiagnosis regarding the activity of the urethra and the pelvic floor muscles.

Preparation of the patient for therapy by a multidisciplinary team, including a diagnostician, a psychologist, a psychiatrist and physiotherapist, specialized in the treatment of patients with urinary dysfunctions, can significantly increase the effectiveness of surgical treatment and limit relapses. A properly prepared questionnaire to evaluate quality of life, expanded with information about functional disorders in childhood or traumatic experiences in the urogenital area, can facilitate a correct diagnosis.

The visualization of the activity of the pelvic floor muscles in standing and prone position, using a transperineal ultrasonogram and surface electromyography, is of great help in the education and therapy of patients in order to improve urination.

Developing a plan of preventive and therapeutic activities, using education and rehabilitation, can prevent the development of full-symptom urinary incontinence and other negative symptoms of dysfunction in the muscles and nerves of the pelvic floor, leading to a deterioration of quality of life.

In our opinion, a multi-disciplinary approach to the therapy of urine retention dysfunctions and additional basic tests can contribute to a better understanding of the specific nature of different types of urinary incontinence in young women, reduce the number of diagnostic errors, hasten the implementation of correct treatment, reduce the recurrence of symptoms, provide a better understanding of the reasons for treatment failure, and increase the number of successfully treated women.

7. References

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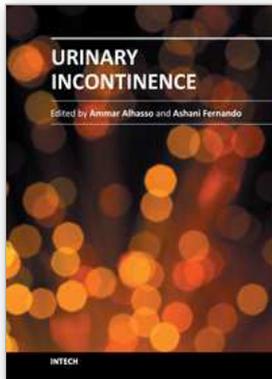
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