

# Lower urinary tract disorders in women

(Zaburzenia czynności dolnych dróg moczowych u kobiet)

A Kowalska <sup>1,A,D</sup>, D Krzemiński <sup>1,F,C</sup>, Z Kopański <sup>1,2,E</sup>, G Sianos <sup>3,B</sup>, Z Maslyak <sup>4,B</sup>,  
I Sklyarov <sup>5,E</sup>

**Abstract** – The authors have presented a concise historical overview of the origin and evolution of urinary incontinence. They have characterised the clinical forms of urinary incontinence in women: stress incontinence, urge incontinence, overflow incontinence, extra-urethral incontinence.

**Key words** - urinary incontinence definition, clinical forms of urinary incontinence.

**Streszczenie** – Autorzy przedstawili krótki rys historyczny tworzenia i ewolucji definicji niedotrzymania moczu. Scharakteryzowali kliniczne postacie niedotrzymania moczu u kobiet: wysiłkowe nietrzymanie moczu, nagłące nietrzymanie moczu, nietrzymanie moczu z przepełnienia, nietrzymanie moczu pozazwieraczowe.

**Słowa kluczowe** - definicja niedotrzymania moczu, postacie kliniczne niedotrzymania moczu.

## Author Affiliations:

1. Collegium Masoviense – College of Health Sciences, Żyrardów
2. Faculty of Health Sciences, Collegium Medicum, Jagiellonian University
3. Glasgow Royal Infirmary Trauma and Orthopaedic Department Glasgow
4. Scientific and Research Institute of Haematology and Blood Transfusion, Kiev, Ukraine
5. Department of Therapy and Medical Diagnosis, Faculty of Postgraduate Education, Lviv National Medical University, Ukraine

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- A. The idea and the planning of the study
- B. Gathering and listing data
- C. The data analysis and interpretation
- D. Writing the article
- E. Critical review of the article

F. Final approval of the article

## Correspondence to:

Prof. Zbigniew Kopański MD PhD, Collegium Masoviense - College of Health Sciences, Żyrardów, G. Narutowicza 35 Str., PL-96-300 Żyrardów, Poland, e-mail: zkopanski@o2.pl

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## I. HISTORICAL OVERVIEW

The first ever definition of stress incontinence has been presented by Holland in 1928. That definition is still up-to-date and it is accepted by the International Continence Society. According to this definition, urinary incontinence is a symptom consisting in involuntary urine flow through urethra. The symptom may impact women, men, and children. It constitutes an outcome of the urethral sphincter mechanism disability or excessive, unknowing, periodical detrusor contractile activity, causing the bladder pressure to exceed the pressure generated by urethral sphincters. The generally accepted definition of urinary incontinence developed by the International Continence Society (ICS – a scientific association, whose main objective is to define standards for the diagnostics, classification, and treatment of urinary incontinence) is: “urinary incontinence is an involuntary and objectively observed urine flow which constitutes a social and hygienic issue for the afflicted person.” (the definition of the World Health Organization and the International Continence Society) [1-3].

Urinary incontinence is an outcome of the urethral sphincter mechanism failing to neutralize the increasing bladder pressure, which constitutes a sum of the detrusor pressure (Pdet – the pressure generated by the detrusor muscle) and intra-abdominal pressure (Pabd – pressure in

the abdomen, generated by the constriction of abdomen muscles, diaphragm muscles, and urogenital diaphragm muscles, forming the pelvic floor). A relevant physiological factor increasing urethral resistance is the impact of intra-abdominal pressure related to the contraction of abdomen and diaphragm muscles while coughing on the short, intra-abdominal section of urethra (placed between the internal urethral orifice and the upper edge of the urethral opening on the pelvic floor). As a result of the decreased efficiency of this mechanism, which is handicapped when the front vaginal wall is lowered, and which causes the lowering of the bladder floor (cystocele) and urethra as well as an unfavourable change in the bladder-urethra angle, the urethral pressure is decreased and stress incontinence is caused.

Thus, plainly speaking, urinary incontinence is an involuntary urine leakage that can be objectively confirmed [1,2,4,5].

## II. THE CLINICAL CHARACTERISTICS OF THE MOST COMMON INCONTINENCE TYPES IN WOMEN

According to International Continence Society, the following urinary incontinence types are distinguished [1-3]:

### 1) Stress incontinence

- Excessive bladder neck mobility
- Sphincter mechanism dysfunction

### 2) Urge incontinence

- Detrusor hyperactivity (OAB – overactive bladder)
- Susceptibility of bladder walls

### 3) Overflow incontinence (ischuria paradoxa):

- Detrusor muscle hypofunction
- Outflow obstruction

### 4) Extra-urethral incontinence

- Fistulas
- Developmental defects: ectopic ureter, ureterovaginal fistula, vesicovaginal fistula, urethrovaginal fistula

### *Stress urinary incontinence*

Stress incontinence is a slight and uncontrolled urine leak occurring most frequently during exercise, coughing, sneezing, and other activities that increase the pressure in the abdomen. The characteristic symptom is that an affected person does not feel the urge to urinate while the urine leakage happens. This type of urinary incontinence is the most frequent in women suffering from genital prolapse, with opened bladder-urethra angle.

Hormonal changes in women over 50 also impact the more frequent occurrence of stress urinary incontinence as

they bring about anatomical changes in the genital and urinary systems, causing predominantly dry mucosa, but also stiffened walls of urethra. Since the genital and urinary systems are very much dependent on one another because of their descent and spatial closeness, virtually all changes and lesions in one impact the other. Take oestrogen – it impacts the vaginal mucosa directly as both the humidity and the mucosa condition are dependent on its dryness- and atrophy-preventing activity. In turn, dryness increases the risk of vaginal infections, which can result in the diseases of urinary system [14]. The study has shown that the shortage of oestrogens causes a decrease in urethra vascular flow, an effect of which is the drop of urethra-closing pressure. The symptoms are more frequently observed in obese people suffering from diabetes, people after pelvis traumas, and women after forceps delivery. The full comprehension and cause determination is not possible for this disease [1,2,6].

Three grades of stress incontinence have been defined by Stamey [6]:

Grade 1: loss of urine with sudden increases of abdominal pressure

Grade 2: loss of urine with lesser degrees of stress: e.g. jumping, climbing stairs, moderate Grade 3: loss of urine during lying, standing up, or walking.

However, the International Continence Society recommends a different kind of categorisation by Blaivas [1,2]:

Type 0 – closed bladder neck is over the interpubic joint is inefficient when coughing, but no urine leak occurs.

Type I – the bladder neck is lower by 2 cm and inefficient during coughing, involuntary urine leaks are caused by physical effort

Type II A – the bladder neck is lower by less than 2 cm and inefficient during coughing, urinary incontinence symptoms are observed as a result of front vagina wall lowering (cystocele)

Type II B – while lying down, the bladder neck is below interpubic joint, and when coughing it moves even lower; this is accompanied by incontinence

Type III – urethral sphincter inefficiency

### *Urge urinary incontinence*

Urge incontinence is an involuntary urine leak accompanied by sudden urine urgency. This symptom is caused by the anatomic and involuntary cramp of detrusor.

Basically, two types of this disease appear:

- Unstable detrusor
- Oversensitivity of the detrusor

The pathogenesis of detrusor instability is related to the dysfunction of bladder smooth muscles. Detrusor oversensitivity is an outcome of the functional inefficiency of reflex arc which governs urination. The multiple symptoms of urge incontinence include: nycturia, involuntary urination preceded by strong urge, incontinence while resting. Usually, the volume of leaked urine is large [1,2,7]

#### *Overflow urinary incontinence (ischuria paradoxa)*

It can occur in both sexes. It is characterised by urine dripping caused by the bladder overflow and a significant distension at its walls. This may be caused by the dysfunction of the central nervous system – for example, as a result of applying medications or as an outcome of diseases such as multiple sclerosis, diabetic polyneuropathy, disc herniated nucleus pulposus with neural pathway damage. Also, cases have been known in which the result of operation aimed at treating incontinence is the excessive elevation of urethra. In men, it occurs because of a bladder outlet obstruction, for example (benign prostatic hyperplasia, prostate cancer, or urethral stricture [1,2,5,8,9].

#### *Extra-urethral urinary incontinence*

According to some authors, it consists in an involuntary urine leakage via a fistula, bypassing the functional urethral mechanism. Urine leakage during day and night is characteristic of that. Congenital causes have been observed. One of them is, for instance, ectopic ureter – it constitutes one of many congenital ureter defects, in which the ureteral orifice is outside the sphincter system. Ectopy is an outcome of disorders in foetal development, when around week 8 of embryo development, a separated ureteral orifice is supposed to be formed on the Wolffian duct [10].

Alongside the aforementioned classification, other types of incontinence have also been described. For instance, mixed urinary incontinence is a combination of two types: stress UI and urge UI. Urination is here defined as an unplanned urine leak. If it happens during sleep, it is deemed nocturnal [1,2].

Nocturnal urination (enuresis nocturna) is often a remnant of childhood and its likely cause is the immaturity of the anterior lobe of the pituitary gland and the insufficient production of vasopressin. Leakages and total emptying of bladder may occur. A characteristic feature of nocturnal urination caused hormonally is urination short after falling asleep. Urine can be easily and normally retained during the day, but at night the correlation of detrusor and sphincter is disturbed as a result of the bladder being suddenly full. Transient urinary incontinence is a disease impacted

by many factors such as: age, partners, pharmacological treatment and even a patient's life situation [1,2,5,8].

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