

# Epidemiology and causes of urinary retention

## (Epidemiologia i przyczyny zatrzymania moczu)

P Uziębło<sup>1,A,B,D</sup>, D Krzemiński<sup>1,C,F</sup>, Z Kopański<sup>1,2,E</sup>, W Ptak<sup>1,A,B</sup>, I Sklyarov<sup>3,E</sup>

**Abstract** – The authors have presented the selected aspects of the epidemiology of urinary retention. They characterised the acute urinary retention (when the person cannot urinate at all) and chronic (partial) urinary retention, taking into account the causes. They have discussed in more detail the urinary retention in women – despite the fact that it occurs less frequently than urinary retention in men, its (neurogenic and/or psychogenic) aetiology is more difficult to be diagnosed unequivocally. The authors have emphasised that psychogenic dysfunctions of the lower urinary tract are often triggered by a psychological factor in the patients with congenital nervous system defects, whose lower urinary tract functioning used to be correct, but might have been on the verge of neurological capacity. Nevertheless, in some cases anatomic changes or neurological deficiencies cannot be located and the treatment can be based only on symptoms.

**Key words** - urinary retention, epidemiology, causes.

**Streszczenie** – Autorzy przedstawili wybrane zagadnienia z epidemiologii zatrzymania moczu. Scharakteryzowali ostre (całkowite) i przewlekłe (częściowe) zatrzymanie moczu uwzględniając przyczyny powstawania. Omówili szczegółowiej zatrzymanie moczu u kobiet, choć wyraźnie rzadziej występujące niż u mężczyzn, to jednak często trudne do jednoznacznego zdiagnozowania etiologii – neurogennej i/lub psychogennej. Podkreślili, że dysfunkcje psychogenne dolnych dróg moczowych, często ujawniają się po zadziałaniu czynnika psychicznego u chorych z wadami wrodzonymi układu nerwowego, u których funkcjonowanie dolnych dróg moczowych było prawidłowe, jednak prawdopodobnie na granicy wydolności neurologicznej. Niekiedy jednak, nie udaje się odnaleźć widocznych zmian anatomicznych ani nieprawidłowości neurologicznych i leczenie może być wyłącznie objawowe.

**Słowa kluczowe** - zatrzymanie moczu, epidemiologia, przyczyny.

### Author Affiliations:

1. Collegium Masoviense – College of Health Sciences, Żyrardów
2. Faculty of Health Sciences, Collegium Medicum, Jagiellonian University
3. Department of Therapy and Medical Diagnosis, Faculty of Postgraduate Education, Lviv National Medical University, Ukraine

### Authors' contributions to the article:

- 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

**Accepted for publication:** November 28, 2017.

## I. GENERAL CHARACTERISTICS

The frequency of urinary retention increases with age for both the sexes. However, in women the ailment occurs 10 times less frequently. In men after 70 years of age, the problem occurs for around 10%, while after 80 years old it rises to around 30% [1-4]. The most common cause of urinary retention is the progression of benign pros-

tate enlargement accompanied by some unfavourable factors such as [5,6]:

- Alcohol consumption,
- Prostate changes,
- Urinary system infections,
- Excessive intake of liquid,
- Undergoing surgery with general anaesthesia.

It has to be emphasised that urinary retention may occur on any given stage of benign prostate enlargement, regardless of the prostate size or the intensity of symptoms in the lower urinary tract. If defining the triggering factor proves impossible, such urinary retention is deemed idiopathic. Other causes of urinary retention in men are: urethral stricture, foreign body in the bladder, bladder tamponade (clots filling the bladder), pelvic area traumas, neurological disorders, and the use of some medications [3,4,7-10].

Alongside the acute (sudden) urinary retention, the phenomenon of the so-called partial urinary retention is also described. As the benign prostate enlargement progresses, the enlarging prostate pressurises the urethra, causing the urethral resistance to rise beyond the detrusor's capacity to perform its function. The bladder pressure rises and the urine is retained. This leads to the development of cystoceles, widened urinary tract caused by impaired urine flow, hydronephrosis, and, in consequence, renal failure [1,11-13].

The slow progression of the disease leads to significant bladder enlargement and serious uroastasis, called urinary retention. An additional symptom at this stage of the disease can be urinary incontinence, i.e. the so called paradoxical incontinence or overflow incontinence. In cases when further bladder enlargement is impossible, urine escapes the full bladder involuntarily, which can be wrongly interpreted by the patient as incontinence [1].

Other causes leading to urinary retention are [1,14-16]:

- Increased alpha-adrenergic activity, which can be caused by: stress, low temperature, alpha-adrenergic drugs used to combat cold, acute prostatitis, infection, bladder overtension,
- Decreased proportions of the stroma components to epithelium in the prostate tissue is observed in men with acute urinary retention (AUR). This phenomenon could explain the role of finasteride in the prevention of urinary retention, as the drug impacts the epithelial components of the prostate tissue, leading to the decreased volume of the prostate in the longer term,

- Neurotransmitter expression disorder – here, a special role is played by the decrease of non-adrenergic, non-cholinergic neurotransmission (vasoactive intestinal peptide, neuropeptide Y),
- prostatitis, during the development of which the more frequent occurrence of inflammatory infiltration in the prostates of men suffering from AUR. Histological features of prostatitis are also considered a risk factor of *benign prostatic hyperplasia* (BPH).

In turn, the factors that contribute to the development of AUR are [11,12,17-19]:

- postnatal perineal inflammation,
- genital herpes, Bartholin's gland abscess,
- acute urethral inflammation, vulvovaginitis,
- detrusor underactivity or atony.

The increased risk factors for acute urinary retention in those patients are urinary tract inflammations, bleeding, excessive fluid consumption and overflowing bladder, alcohol abuse [1,4].

## II. THE AETIOLOGY OF ACUTE URINARY RETENTION (AUR)

AUR is characterised by sudden, painful inability to empty the bladder. Painless AUR occurs rarely and is most often related to the pathology of the central nervous system. AUR can be divided into a provoked one and an intrinsic one [1].

AUR can be triggered by the following factors [1,4,7,11,12]:

- a surgery with general or local anaesthesia;
- excessive fluid intake;
- excessively stretched bladder;
- urinary tract infection;
- prostatitis, alcohol intake;
- taking medications with sympathicomimetic or cholinolytic effects.

In most cases, the triggering factor remains unknown and the AUR is deemed intrinsic.

There are some mechanisms which can lead to acute urinary retention [1,11,12]:

- increased urethral resistance resulting from an anatomic obstruction (urethral stricture, enlarged prostate, bladder tamponade);
- increased urethral resistance resulting from a functional obstruction (the overtension of urethral

smooth muscles caused by increased alpha-adrenergic stimulation);

- overtension of the bladder (immobilisation, constipation, medications inhibiting the bladder's ability to shrink);
- neurogenic causes (e.g. diabetic cystopathy).

### III. THE AETIOLOGY OF CHRONIC URINARY RETENTION (CUR)

If the cause of CUR is a bladder obstruction, the pressure generated by the detrusor during micturition is high and the urine flow is weak. After the micturition is finished, the bladder pressure is still high, which leads to the increase of the pressure and bilateral widening of the upper urinary tract. Extrarenal kidney failure might be developed. Patients suffering from detrusor underactivity or atony have large volumes of urine stored, but the bladder pressure remains low (low-pressure urinary retention). Lower urinary tract symptoms (LUTS) are usually not intensified, especially in the early stages, until involuntary micturition at night occurs, triggered by lower urethral resistance and increased bladder pressure. This symptom is called overflow incontinence (ischuria paradoxa) [1,7,18,19].

### IV. SYMPTOMS OF CHRONIC URINARY RETENTION

Chronic urinary retention occurs as a result of storing a certain volume of urine after each bladder emptying. In order to confirm the CUR diagnosis, the constantly stored volume must exceed 300 ml (or 500 ml, according to some authors) and might reach several litres. Those affected might show no symptoms or observe releasing only small volumes of urine when urinating, as well as having problems to commence and retain micturition. Other symptoms include night urination (nocturia), overflow incontinence, palpable bladder (first with pain, and in the final stages of urinary retention – with no pain), and kidney failure symptoms. The intensity of LUTS is mild [1].

#### Differentiation

The differentiation is usually easy. However, ailments such as diverticulitis, diverticular abscess, intestine perforation or ischemia, aortic aneurysm, may result in symptoms that are similar to urinary retention, and also can cause it. Therefore, patients require re-examination after catheterisation so that other diagnoses can be ruled out. Sporadically,

an obese patient with kidney failure might be diagnosed as an AUR case [4].

### V. URINARY RETENTION IN WOMEN

The problem of urinary retention in women is much less frequent than in men and it is also caused by other aetiological factors.

One can divide the causes of women's urinary retention into two basic groups: neurogenic and psychogenic.

The neurogenic aetiology pertains to women at different ages and can be very diverse, depending on the cause that triggers the neurogenic micturition disorders.

The psychogenic aetiology is the case almost exclusively for women under 25 and it remains unexplained in greater detail.

Regardless of the cause, urinary retention always requires precise diagnostics, which is difficult especially in the case of psychogenic aetiology. Urinary retention diagnostics must be comprehensive and based on the collected medical history data as well as on the clinical, neurological, endoscopic, radiologic, and urodynamic examinations. Usually, the test that is decisive for the diagnosis is the urodynamic one, which indicates one of the two main causes of the retention – i.e. the detrusor muscle underactivity or overactivity of the sphincter apparatus causing a functional bladder outlet obstruction. A frequent cause of partial urinary retention in women is a habit of withholding micturition. This causes the external urethral sphincter to grow, causing a mechanical obstruction for the urine flow [11,12,20-22].

Neurogenic dysfunctions of the lower urinary tract might be caused by: congenital spinal defects, spinal cord or cauda equina damage, the pressure put on the spinal cord or spinal roots by tumours, intervertebral disc prolapse, spinal cord inflammations, neurological diseases damaging the neurolemma of peripheral nerves, or iatrogenic damage to the lower urinary tract innervation. They usually trigger one of the two aforementioned causes of urinary retention. The simultaneous occurrence of both the causes of neurogenic urinary retention is extremely infrequent and is related to a mixed aetiology.

Psychogenic dysfunctions of the lower urinary tract are often activated after the psychological factor is triggered in the patients with congenital nervous system defects whose lower urinary tract worked fine, yet on the fringe of neurological capacity. Sometimes no anatomical changes or neu-

rological defects are visible and the treatment can only be symptom-based [11,12].

## VI. REFERENCES

- [1] Kalejaiye O, Speakman MJ. Management of acute and chronic retention in men. *Eur Urol Suppl* 2009; 8:523-529.
- [2] Thorne MB, Geraci S.A. Acute urinary retention in elderly men. *Am J Med* 2009; 122: 815–819
- [3] Myśliwiec M. Choroby nerek. Warszawa; PZWL, 2008.
- [4] Borkowski A. Urologia. Warszawa; PZWL, 2006.
- [5] Roehrborn CG. Pathology of benign prostatic hyperplasia. *Int J Impot Res* 2008; 20 (Suppl 3): 11-18.
- [6] Mark J, Speakman MJ. Lower Urinary Tract Symptoms Suggestive of Benign Prostatic Hyperplasia (LUTS/BPH): More Than Treating Symptoms? *Eur Urol Suppl*. 2008; 7: 680-689.
- [7] Nauck F, Alt-Epping B. Crises in palliative care – a comprehensive approach. *Lancet Oncol* 2008; 9(11): 1086-91.
- [8] Cushing RM. Major urologic complications following radium and X-ray therapy for carcinoma of the cervix. *Am J Obstet Gynec* 1968;101:750-755.
- [9] Dean RJ, Lytton B. Urologic complications of pelvic irradiation. *J Urol* 1978; 119:64-67.
- [10] Graham JB, Abad RS. Ureteral obstruction due to radiation. *Am J Obstet Gynec* 1967; 99:409-412.
- [11] Barone JG, Berger Y. A cute urinary retention in females. *Int Urogynecol J* 1993; 4(3):152-156.
- [12] Vander Linden EF, Venema PL. A cute urinary retention in women. *Ned Tijdschr Geneesk* 1998;142(28):1603-1606.
- [13] International Classification of Diseases. Switzerland, Geneva; World Health Organization, 1992.
- [14] Emberton M, Anson K. Acute urinary retention in men: an age old problem. *BMJ* 1999; 318: 921–925.
- [15] Hogenson KD. Acute postoperative hypertension in the hypertensive patient. *J Post Anest Nurs* 1992; 7: 38–44.
- [16] Stafford RS, Furberg CD, Finkelstein SN, Cockburn IM, et al. Impact of clinical trial result on national trends in alpha-blocker prescribing 1996–2002. *JAMA* 2004; 291: 54–62.
- [17] Kumar A, Banerjee GK, Goel MC. Non-neurogenic, non-organic urinary retention in female: An indication for urodynamic valuation. *Indian J Urol* 1996;12(2):55-59.
- [18] Wheeler JS, Walter JS. Urinary retention in females: are view. *Int Urogynecol J* 1992; 3(2):137-142.
- [19] Mosli HA, Farsi HM, Rimawi MH. Retention of urine in females: causes and management. *East Afr Med J* 1991; 68(8):617-623.
- [20] Sakakibara R, Uchiyama T, Awa Y. Psychogenic urinary dysfunction: a uro-neurological assessment. *Neurourol Urodynam* 2007; 26(4):516-524.
- [21] Bird JR. Psychogenic urinary retention. *Psychother Psychosom* 1980; 34(1):45-51.
- [22] Sagar RS, Ahuja N. Psychogenic urinary retention. *Am J Psychiatry* 1988; 145(9): 1176-117.